The Need For Urgency in Treating Hyperlipidemia in post-ACS Patients

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CMUH

Case Summary

- 68 y/o man, non-smoker
- HTN for decades on Rx, sBP 120-130
- Regular health exam – data ok informed from many physician
- Referred from 大千 to my clinic for NSTEMI
- Chest oppressive sensation for 4-5 hours last Sunday, sBP drop to 80-90 mmHg, visit 大千 2 days later
- No more chest pain, sBP 120-130

Case Summary

- 大千 study

  Echo: EF 50%, hypokinesis of inferior wall

  ECG: NSR, inverted T over inferior leads

  Troponin I: 7 ng/ml

- My OPD

  BP 120/80 mmHg, Loading aspirin, Plavix, repeat cardiac enzyme, check LDL

  Xanthelasma……

  Transfer to ER for follow up

Case Summary

- ER
  - Troponin I 2.0 ng/ml, ECG: no evolutional change
  - Heparin pump and admit to ward
- Cath next day
- 3-V CAD, RCA 90% stenosis, LAD/LCx CTO
- Transfer to ICU and wait CABG evaluation

What do we miss…..

- Forget to loading statin in ACS patients (regardless of LDL data)
- LDL 150
  Lipitor 20 mg 1# qd

Use High Intensity Statin in ACS Patients

AHA/ACC divides statin therapies into 3 intensity categories[1]:

Average LDL-C reducing effect	High-intensity ≥ 50%	Moderate-intensity 30% - 49%	Low-intensity < 30%
Daily doses	**Atorvastatin 40-80 mg** **Rosuvastatin 20 mg (40 mg)**	**Atorvastatin 10-20 mg** **Rosuvastatin 5-10 mg** **Simvastatin 20-40 mg** **Pravastatin 40-80 mg** **Lovastatin 40-80 mg** Pitavastatin 1-4 mg **Fluvastatin 40 mg BID**/80 mg	Simvastatin 10 mg **Pravastatin 10-20 mg** **Lovastatin 20 mg** Fluvastatin 20-40 mg
	Rosuvastatin is only approved at 20 mg in Taiwan[2]	*Rosuvastatin 5 mg starting dose is recommended in Asians with caution taken when titrating[2]*	

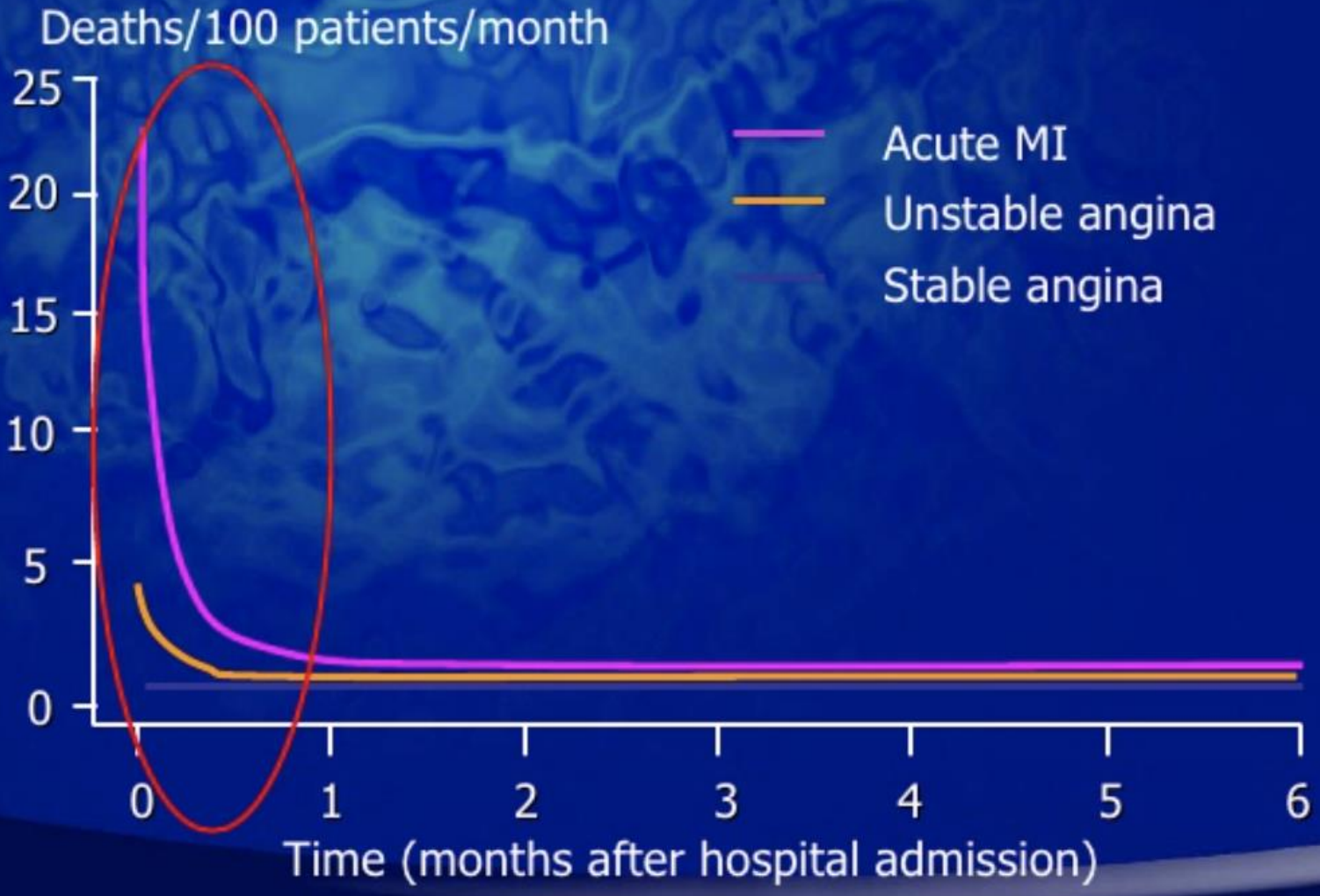
Boldface type indicates specific statins and doses that were evaluated in RCTs, and the Cholesterol Treatment Trialists' 2010 meta-analysis. All these RCTs demonstrated a reduction in major cardiovascular events.
ACC, American College of Cardiology; AHA, American Heart Association; BID, twice daily; LDL-C: low-density lipoprotein cholesterol; RCT, randomized controlled trial.

1. Gundy SM et al. J Am Coll Cardiol. 2019 Jun 25;73(24):e285-e350. 2. Rosuvastatin 中文仿單

What do we miss…..

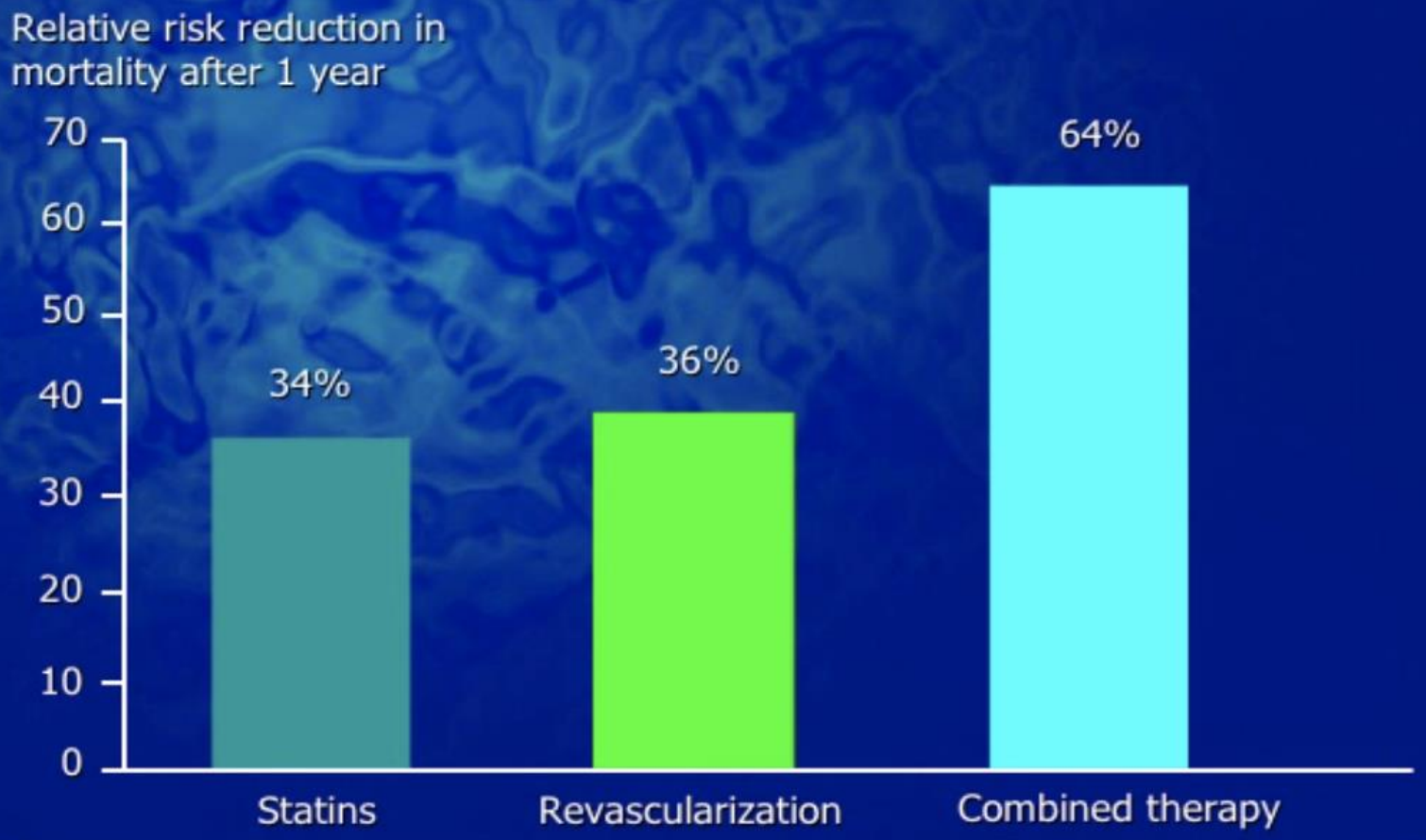
- Forget to loading statin in ACS patients (regardless of LDL data)
- LDL 150
  Lipitor 20 mg 1# qd
- Lipitor 20 mg 2# qd the next day

Risk of death in patients with coronary heart disease is greatest early after an ACS



Braunwald (1996)

Swedish Registry: Early Statin and Revascularization Reduce Mortality



Pleiotropic effects of statins

Statins

↓ Coagulation

↓ Platelet activation

↑ Endothelial progenitor cells

↑ Endothelial function
↑ NO bioactivity
↓ Reactive oxygen species

↓ Effects on collagen
↓ MMPs

↓ Macrophages
↓ Inflammation
↓ Immunomodulation

↓ AT_1 receptor
↓ VSMC proliferation

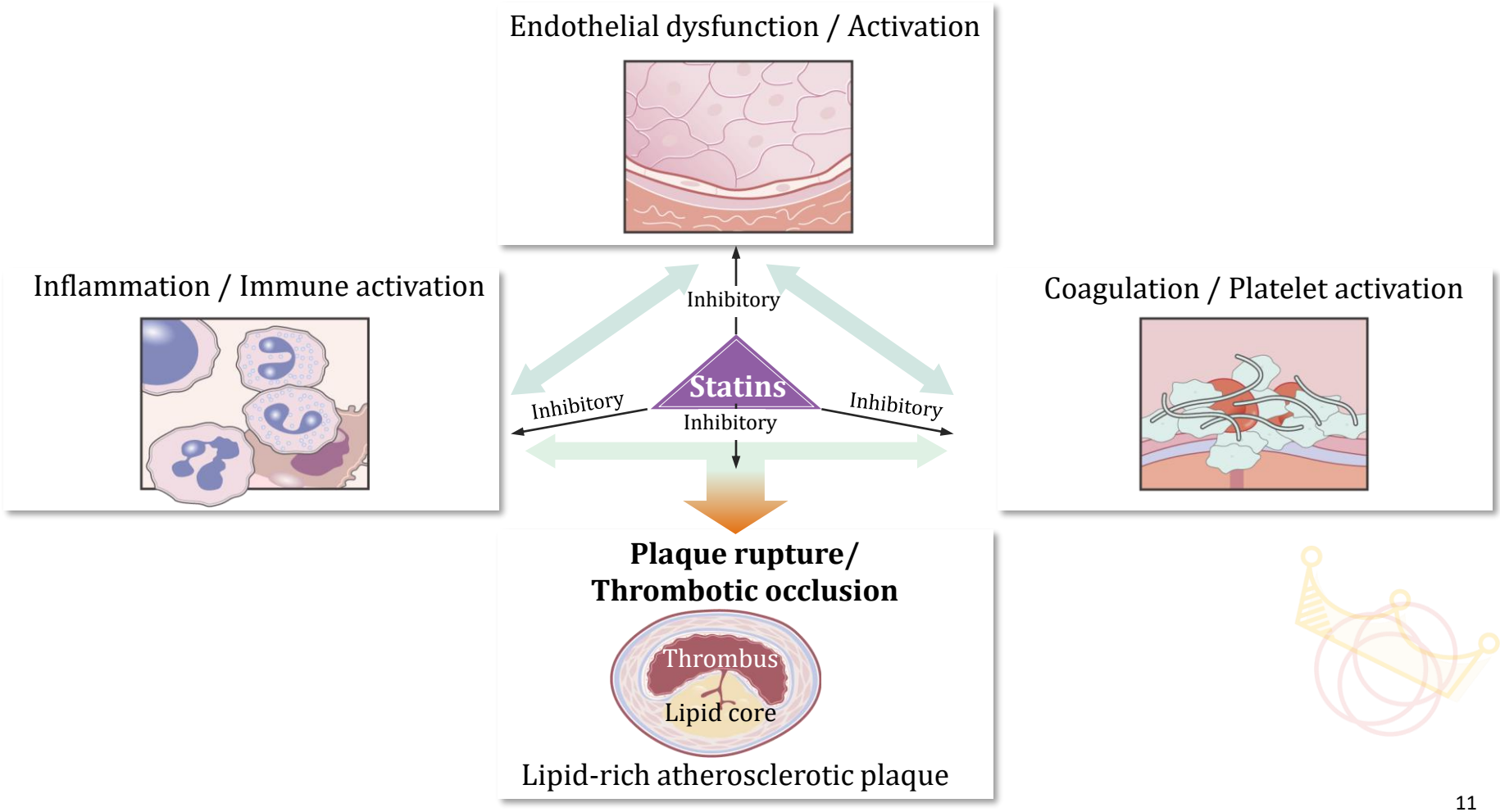
↓ Endothelin

MMPs = matrix metalloproteinases

Liao JK. *Am J Cardiol.* 2005;96(suppl 1):24F-33F.

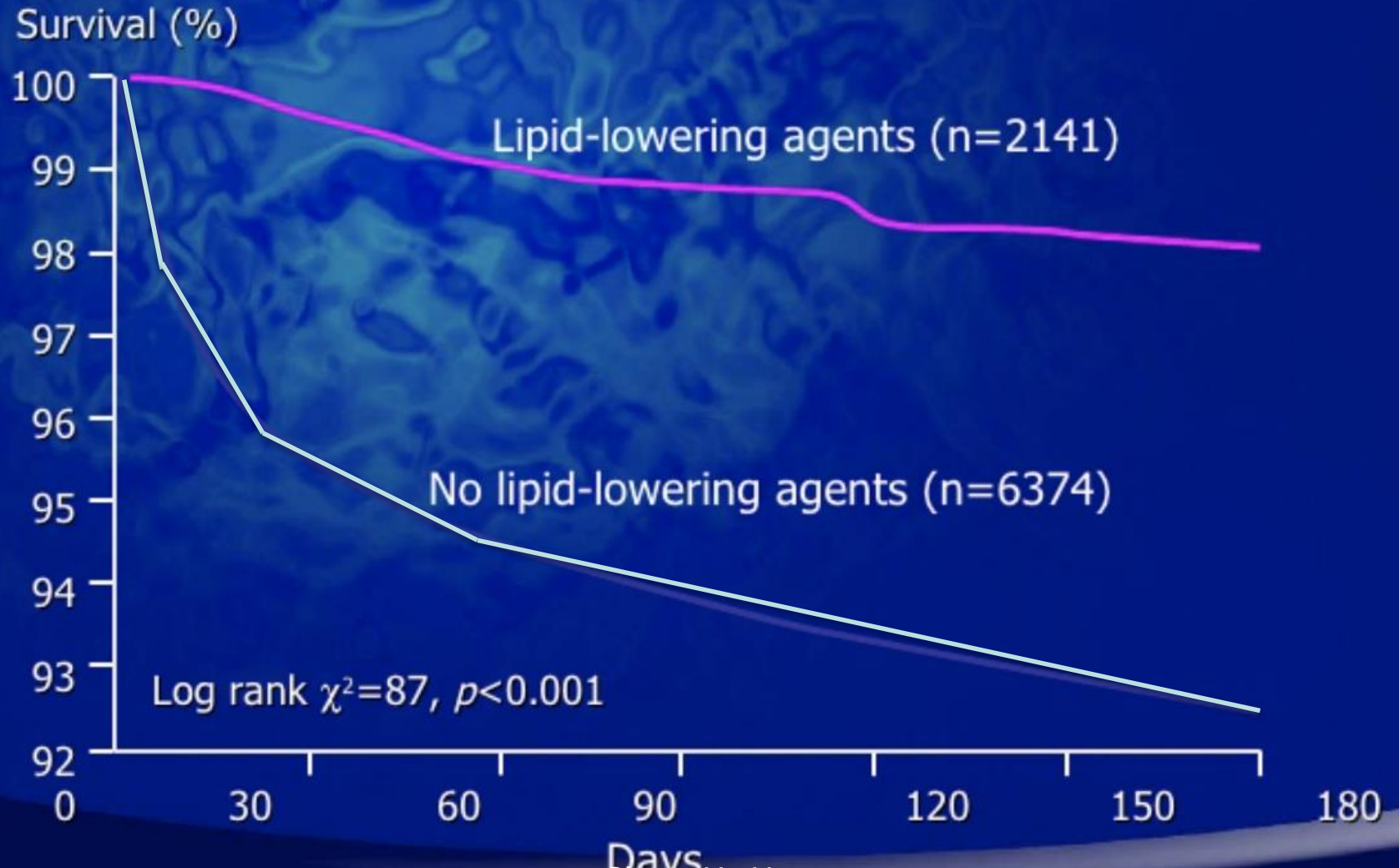
Statins have distinct effects on each component of the vascular triad implicated in atherothrombosis

Summary of the lipid-independent effects of statins



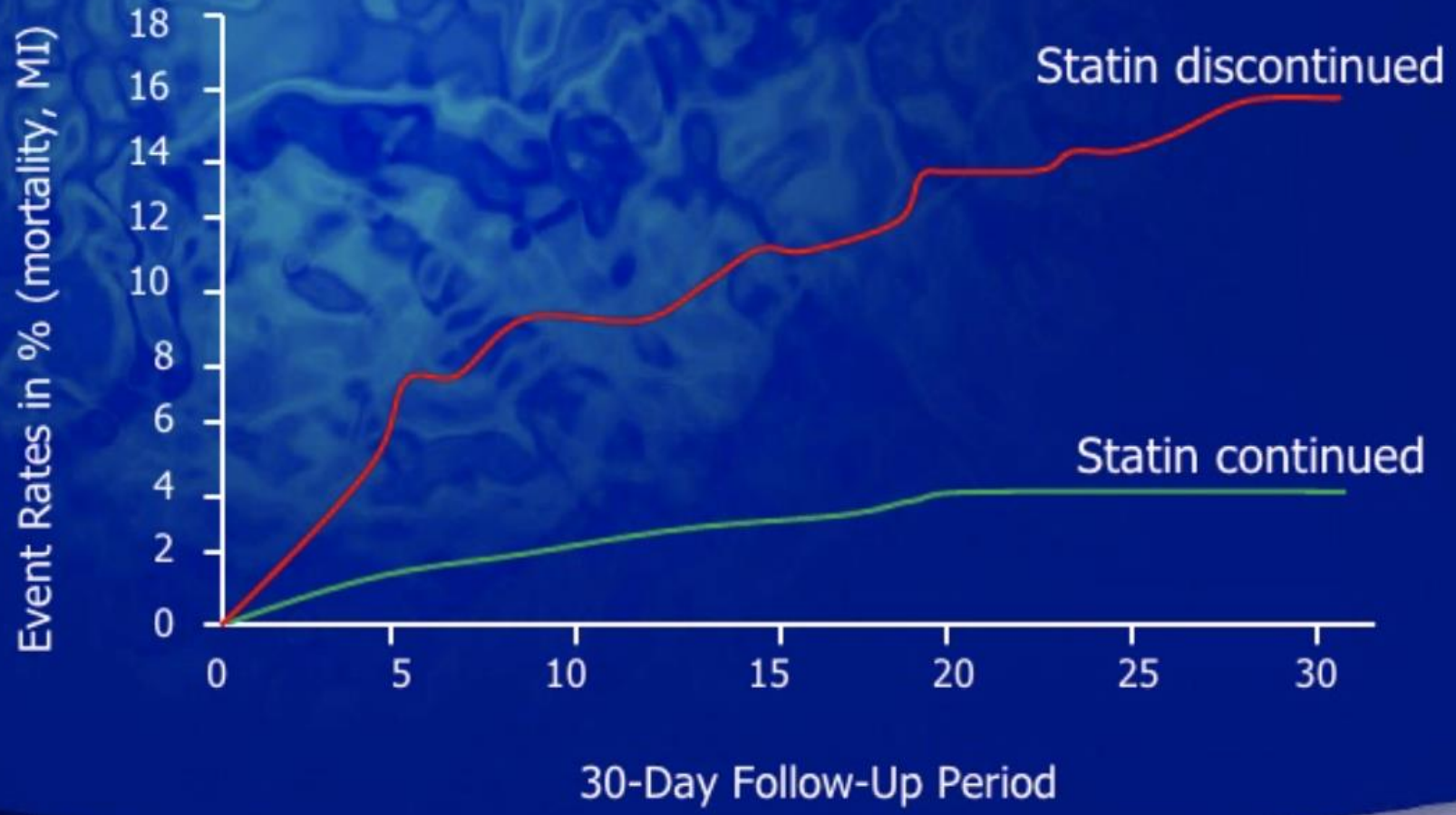
Ray KK, Cannon CP. J Am Coll Cardiol. 2005 Oct 18;46(8):1425-33.

PURSUIT: Retrospective analysis shows early mortality reduction with lipid-lowering therapy



Aronow et al (2000)

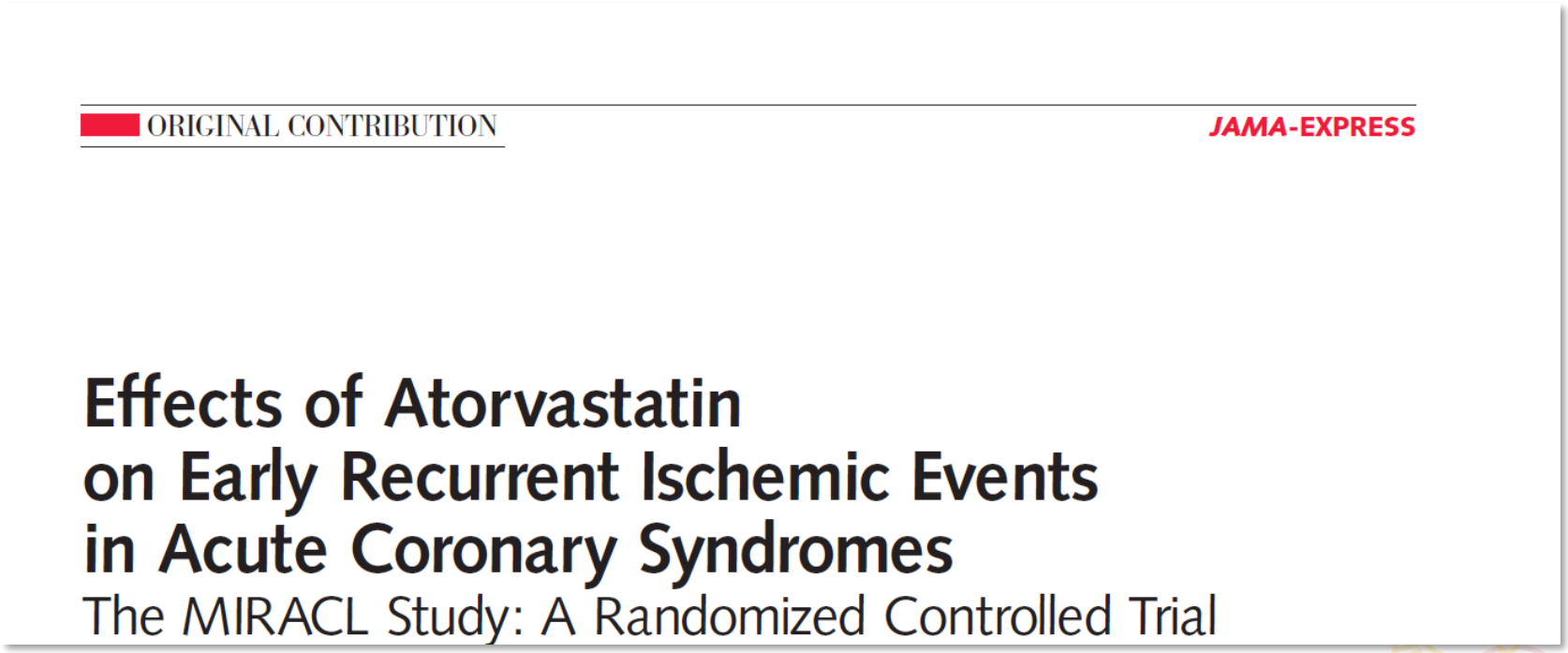
PRISM: Event Rates After Statin Withdrawal in Acute Coronary Syndrome



(N = 1616)

Heeschen C, et al. Circulation. 2002;105:1446–1452.

MIRACL study



ORIGINAL CONTRIBUTION

JAMA-EXPRESS

Effects of Atorvastatin on Early Recurrent Ischemic Events in Acute Coronary Syndromes

The MIRACL Study: A Randomized Controlled Trial

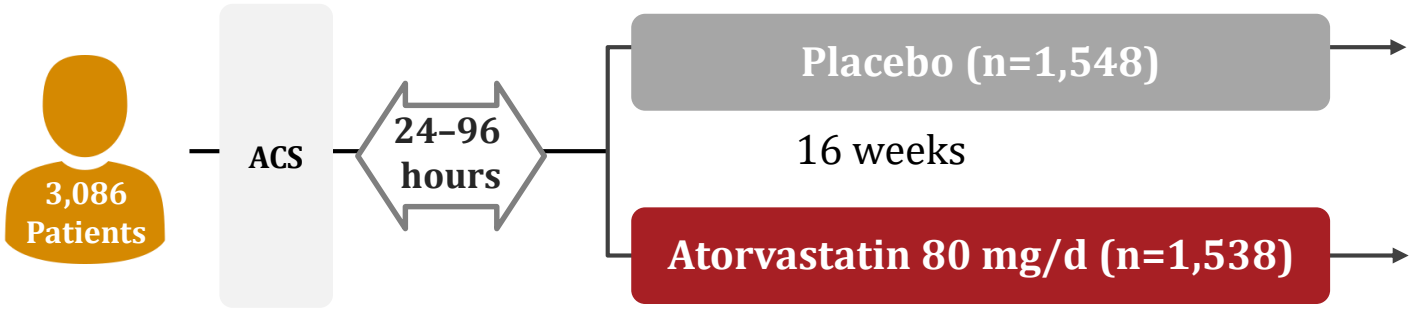
Myocardial **I**schemia **R**eduction with **A**ggressive **C**holesterol **L**owering **S**tudy

Schwartz GG, et al. JAMA. 2001 Apr 4;285(13):1711-8.

Study design

Randomized, double-blind trial

Aged ≥ 18 years with unstable angina or non–Q-wave acute myocardial infarction.



Primary end point

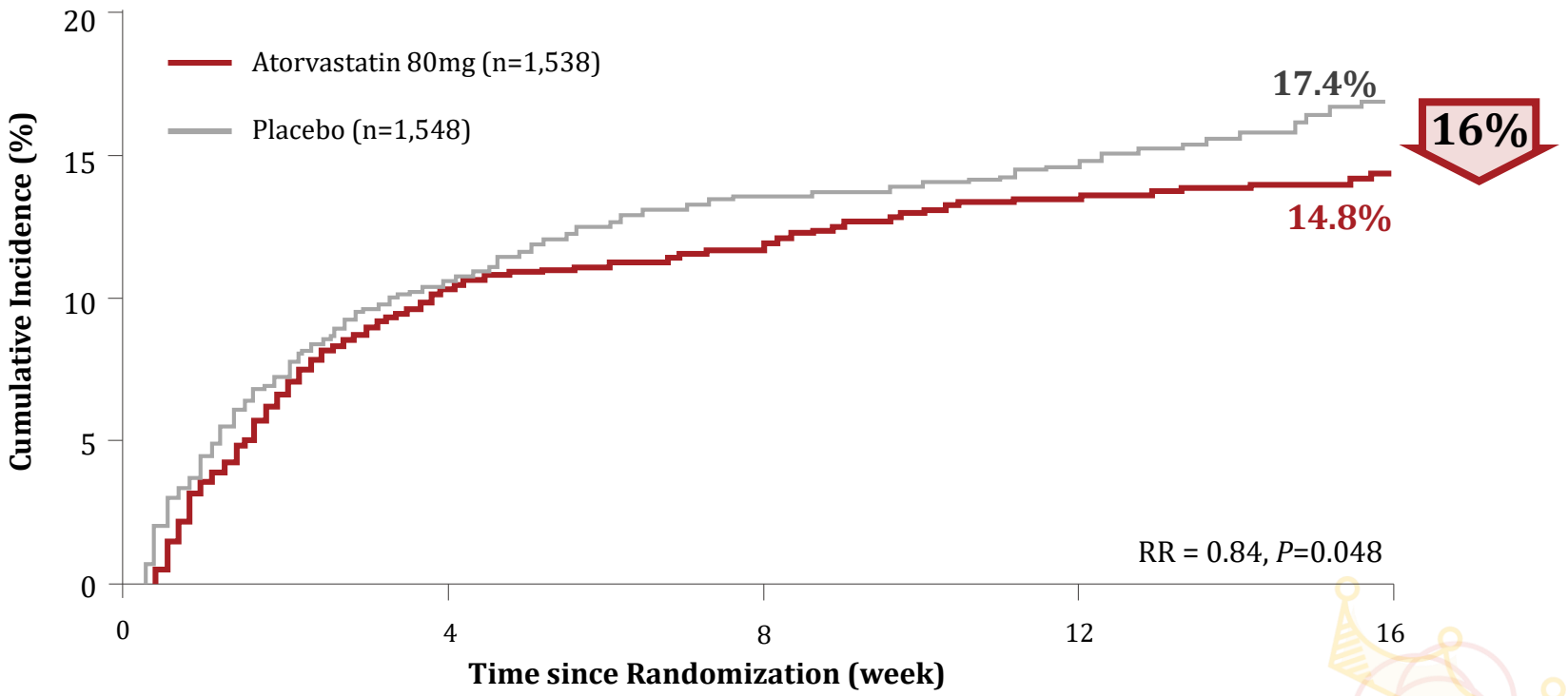
- Composite of death
- Nonfatal acute MI
- Cardiac arrest with resuscitation
- Recurrent symptomatic MI requiring rehospitalization

ACS, acute coronary syndrome; MI, myocardial infarction

Schwartz GG, et al. JAMA. 2001 Apr 4;285(13):1711-8.

Atorvastatin significantly reduced recurrence of ischemic events in patients with ACS

Time to first occurrence of MACE*



No. at risk

Atorvastatin	1,538	1,381	1,351	1,323	518
Placebo	1,548	1,384	1,338	1,318	473

* Included death (any cause), nonfatal MI, resuscitated cardiac arrest and worsening angina with new objective evidence requiring urgent rehospitalization.
ACS, acute coronary syndrome; MACE, major adverse cardiovascular events.

Schwartz GG, et al. JAMA. 2001 Apr 4;285(13):1711-8.

There were significantly greater reductions in LDL and CRP with atorvastatin -1

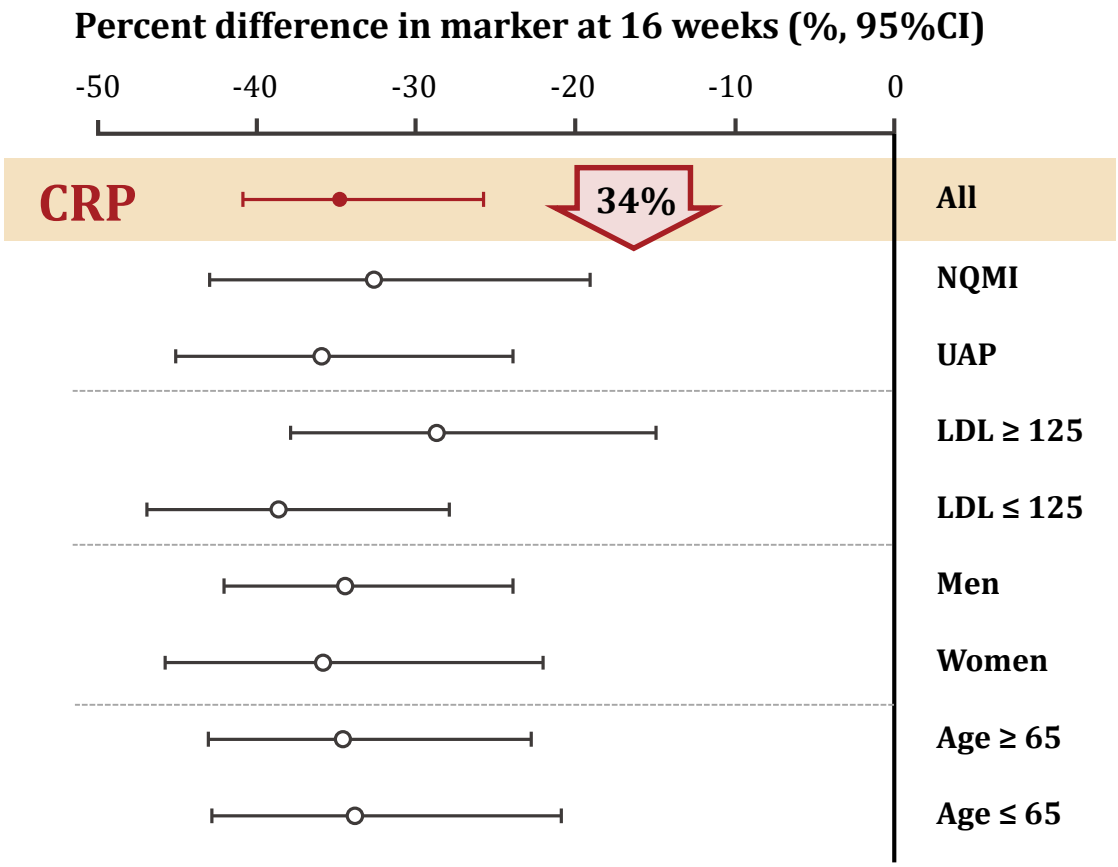
		Baseline mean	Final mean	Reduction %	*P* value
LDL-C (mg/dL)	**Atorvastatin 80 mg**	**124**	**72**	**-42%**	*P<0.0001*
	Placebo + diet	125	136	+9%	
CRP (mg/dL)	**Atorvastatin 80 mg**	11.5	1.9	**-83%**	*P<0.0001*
	Placebo + diet	11	2.9	-74%	

Adapted from Kinlay S, et al. 2003

LDL-C, low density lipoprotein cholesterol; CRP, C-reactive protein.

Kinlay S, et al. Circulation. 2003 Sep 30;108(13):1560-6.

There were significantly greater reductions in LDL and CRP with atorvastatin -2



LDL-C, low density lipoprotein cholesterol; CRP, C-reactive protein; NQMI, on–Q-wave myocardial infarction UAP, unstable angina pectoris.

Kinlay S, et al. Circulation. 2003 Sep 30;108(13):1560-6.

Conclusions

Patients with **acute coronary syndrome**

+

High intensity atorvastatin

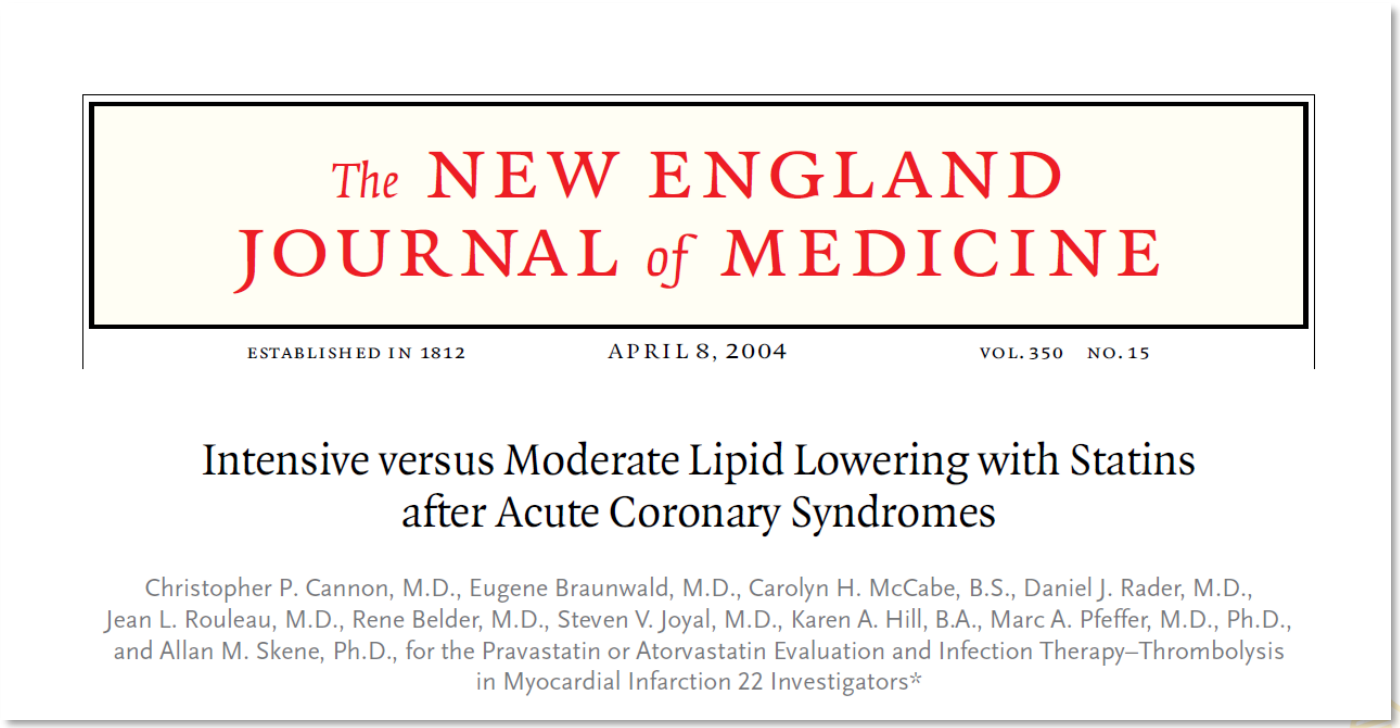
16%
MACE

34%
CRP

MACE, major adverse cardiovascular events; PCI, percutaneous coronary intervention; LDL-C, low density lipoprotein cholesterol; CRP, C-reactive protein.

1. Schwartz GG, et al. JAMA. 2001 Apr 4;285(13):1711-8. 2. Kinlay S, et al. Circulation. 2003 Sep 30;108(13):1560-6.

PROVE-IT*study



The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 8, 2004 VOL. 350 NO. 15

Intensive versus Moderate Lipid Lowering with Statins after Acute Coronary Syndromes

Christopher P. Cannon, M.D., Eugene Braunwald, M.D., Carolyn H. McCabe, B.S., Daniel J. Rader, M.D., Jean L. Rouleau, M.D., Rene Belder, M.D., Steven V. Joyal, M.D., Karen A. Hill, B.A., Marc A. Pfeffer, M.D., Ph.D., and Allan M. Skene, Ph.D., for the Pravastatin or Atorvastatin Evaluation and Infection Therapy–Thrombolysis in Myocardial Infarction 22 Investigators*

Pravastatin or Atorvastatin Evaluation and Infection Therapy–Thrombolysis in Myocardial Infarction 22

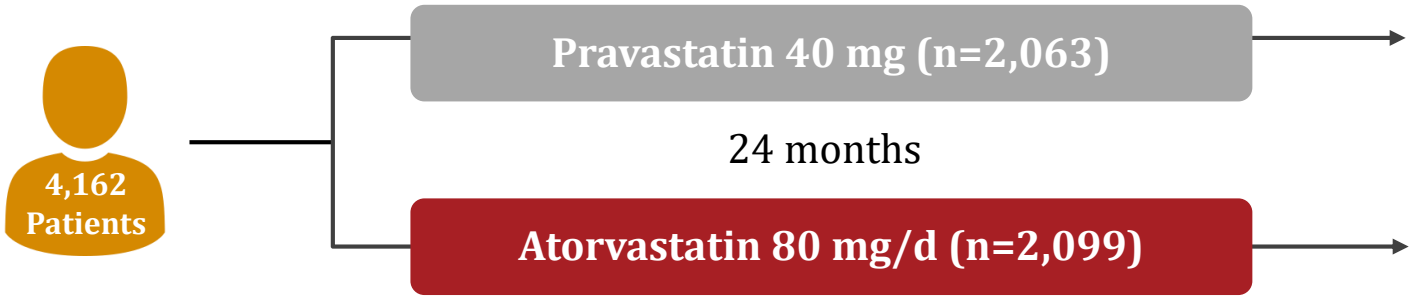
*sponsored by Bristol Myers Squibb and Sankyo

Cannon CP, et al. N Engl J Med. 2004 Apr 8;350(15):1495-504.

Study design

Randomized, double-blind trial

Patients who had been hospitalized for ACS (acute MI with or without ST-segment elevation or high-risk UA) within the preceding 10 days



Primary end point

Composite of:

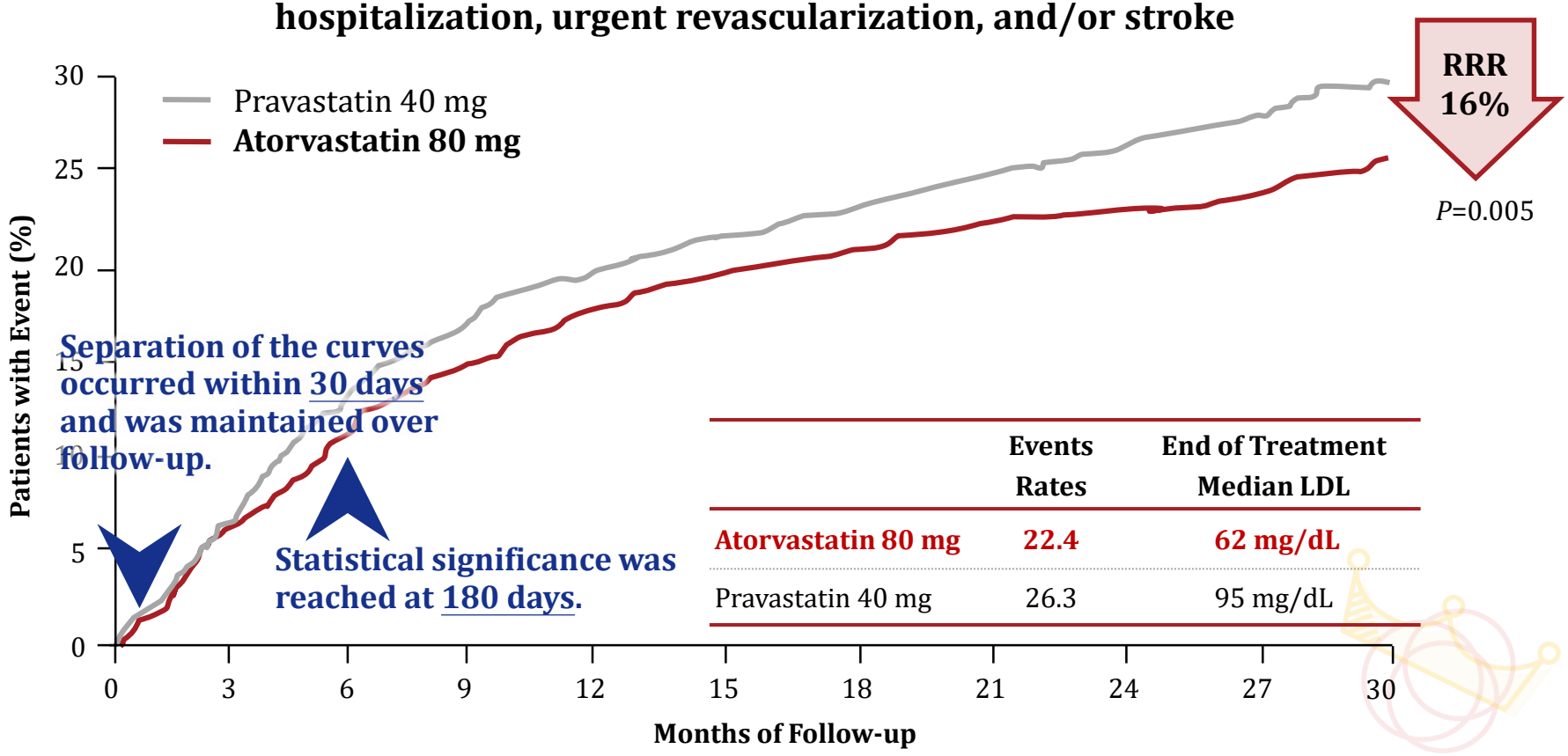
- Death from any cause
- Myocardial infarction
- Documented unstable angina requiring rehospitalization
- Revascularization (performed at least 30 days after randomization)
- Stroke

ACS, acute coronary syndrome; TC, total cholesterol; MI, myocardial infarction.

Cannon CP, et al. N Engl J Med. 2004 Apr 8;350(15):1495-504.

Atorvastatin 80 mg provided greater protection against death or major cardiovascular events vs standard regimen

All-cause death, non-fatal MI, unstable angina requiring hospitalization, urgent revascularization, and/or stroke



	Events Rates	End of Treatment Median LDL
Atorvastatin 80 mg	**22.4**	**62 mg/dL**
Pravastatin 40 mg	26.3	95 mg/dL

MI, myocardial infarction; RRR, relative risk reduction.

Cannon CP, et al. N Engl J Med. 2004 Apr 8;350(15):1495-504.

LDL and CRP were substantially reduced with atorvastatin

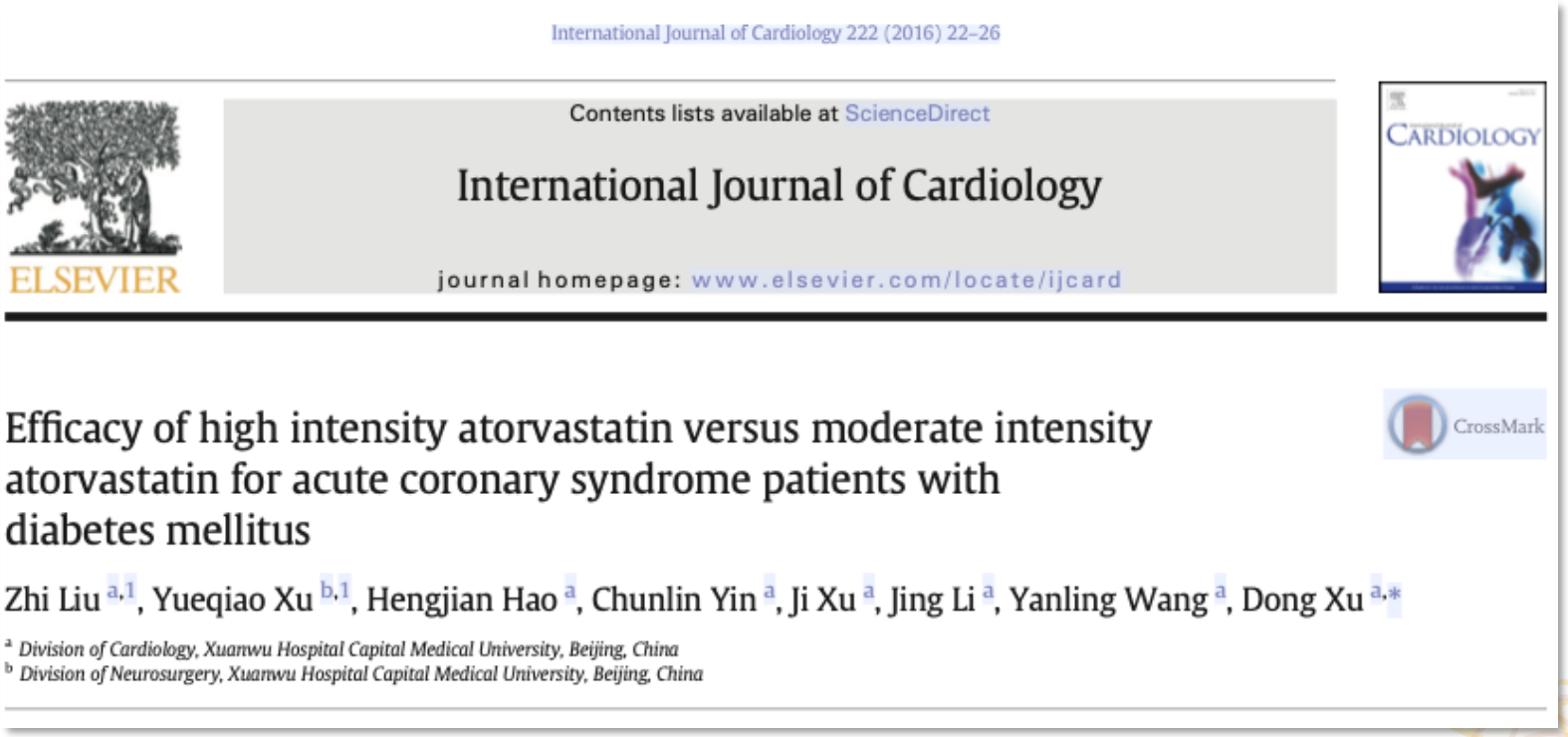
		Baseline mean	Final mean	Reduction %	*P* value
LDL-C (mg/dL)	**Atorvastatin 80 mg**	106	62	**-42%**	*P*<0.001
	Pravastatin 40 mg	106	95	-10%	
CRP (mg/dL)	**Atorvastatin 80 mg**	12.3	1.3	**-89%**	*P*<0.001
	Pravastatin 40 mg	12.3	2.1	-83%	

Adapted from Cannon CP, er al. 2004

LDL-C, low density lipoprotein cholesterol; CRP, C-reactive protein.

Cannon CP, et al. N Engl J Med. 2004 Apr 8;350(15):1495-504.

LIU Z, et al. (Asian study)



International Journal of Cardiology 222 (2016) 22–26

Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

Efficacy of high intensity atorvastatin versus moderate intensity atorvastatin for acute coronary syndrome patients with diabetes mellitus

Zhi Liu [a,1], Yueqiao Xu [b,1], Hengjian Hao [a], Chunlin Yin [a], Ji Xu [a], Jing Li [a], Yanling Wang [a], Dong Xu [a,*]

[a] Division of Cardiology, Xuanwu Hospital Capital Medical University, Beijing, China
[b] Division of Neurosurgery, Xuanwu Hospital Capital Medical University, Beijing, China

Long-term High Intensity Atorvastatin in
Acute Coronary Syndrome Patients with Diabetes Mellitus

Liu Z, et al. Int J Cardiol. 2016;222:22–26.

Study design

Randomized, controlled trial

ACS patients with type 2 diabetes mellitus who underwent primary or early PCI and aged ≤ 80 years

Primary end point

One-year incidence of MACE, including:

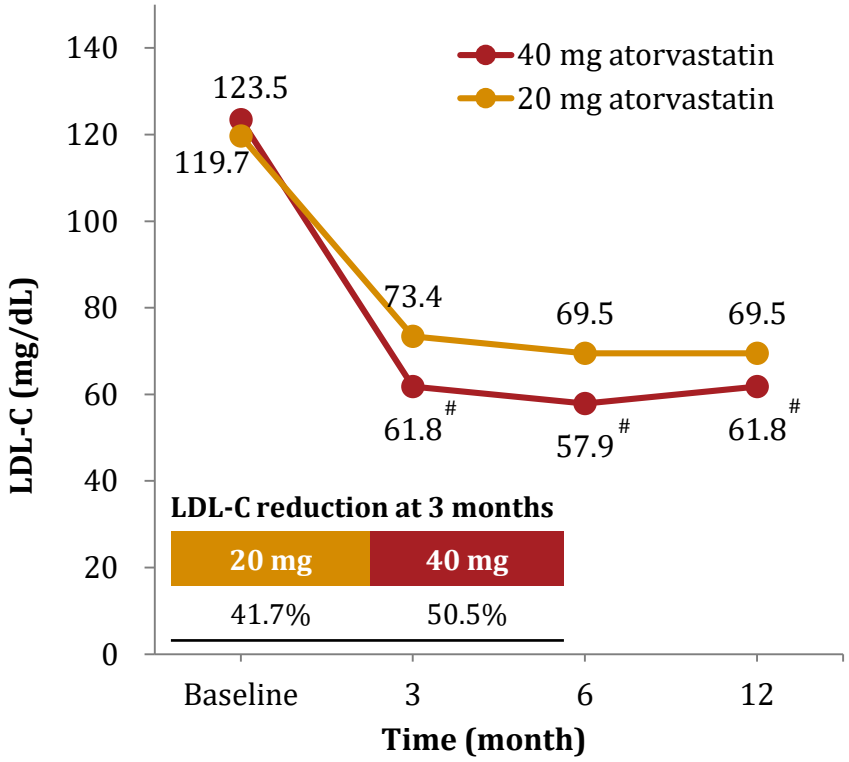
- Cardiovascular death
- Spontaneous myocardial infarction
- Unplanned revascularization
  (revascularization of stenosis <70% at the first time angiography)

ACS, acute coronary syndrome; MI, myocardial infarction; MACE, major adverse cardiovascular events.

Liu Z, et al. Int J Cardiol. 2016;222:22–26.

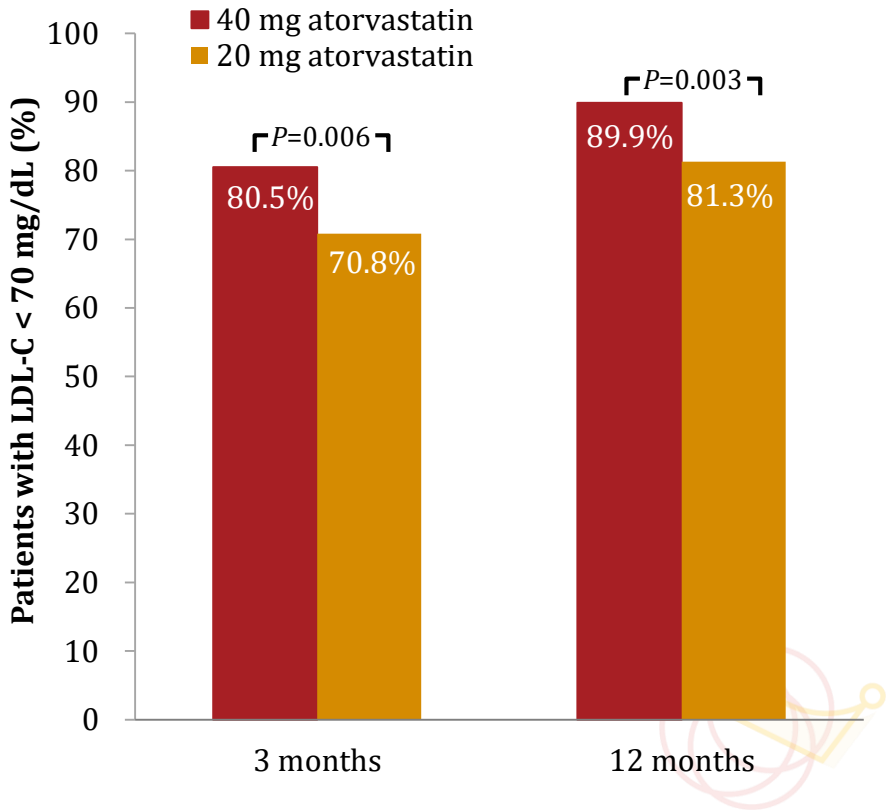
High-intensity atorvastatin significantly lower LDL-C, resulting more patients at goal

LDL concentration



Adapted from Table 3, Liu Z, et al. 2016

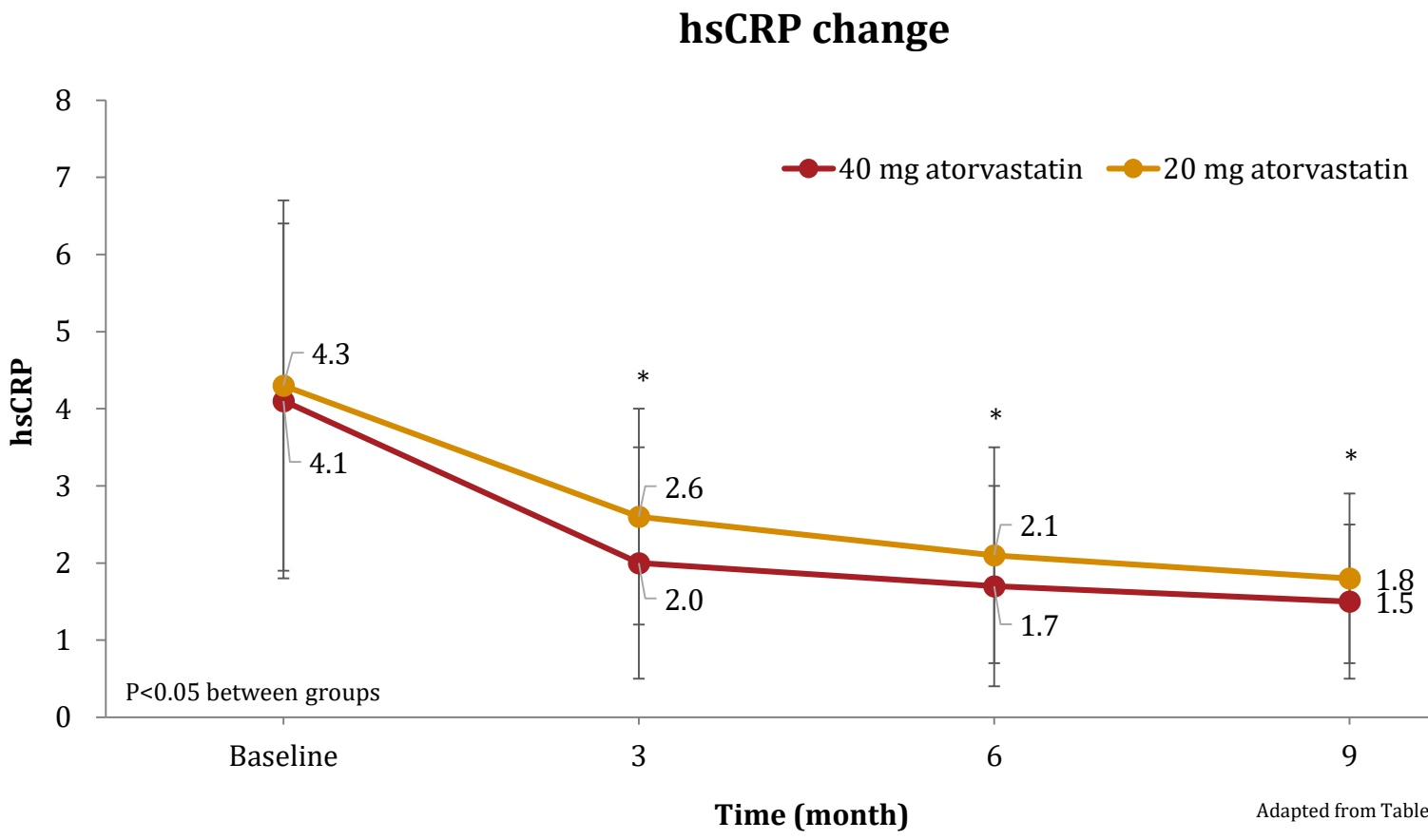
Patients at LDL-C goal



# $p < 0.05$ compared with 20 mg/day group.

Liu Z, et al. Int J Cardiol. 2016;222:22–26.

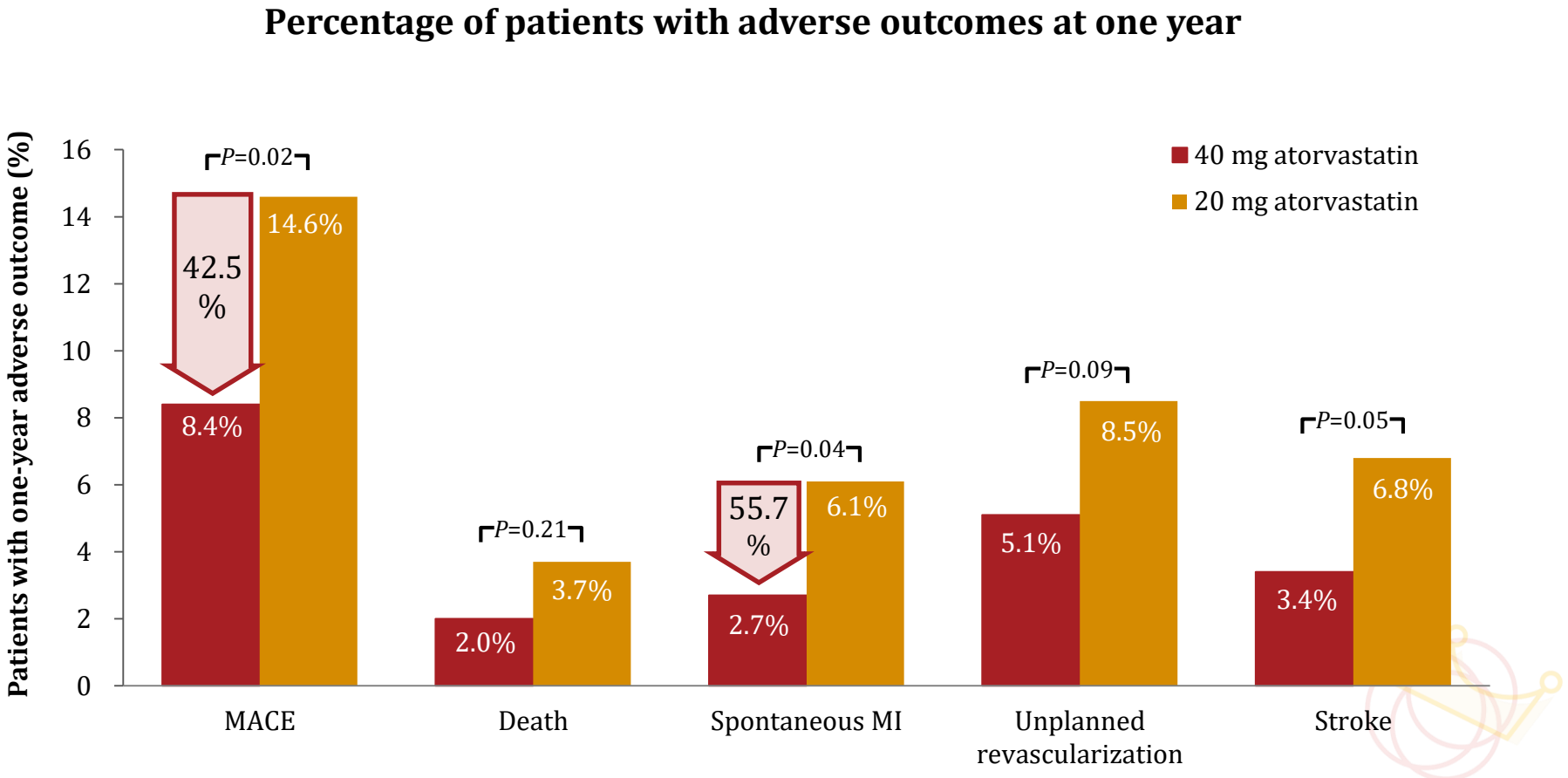
High-intensity atorvastatin constantly lowering hsCRP in first year



Adapted from Table 3, Liu Z, et al. 2016

Liu Z, et al. Int J Cardiol. 2016;222:22–26.

High-intensity atorvastatin significantly decreased adverse cardiovascular outcomes

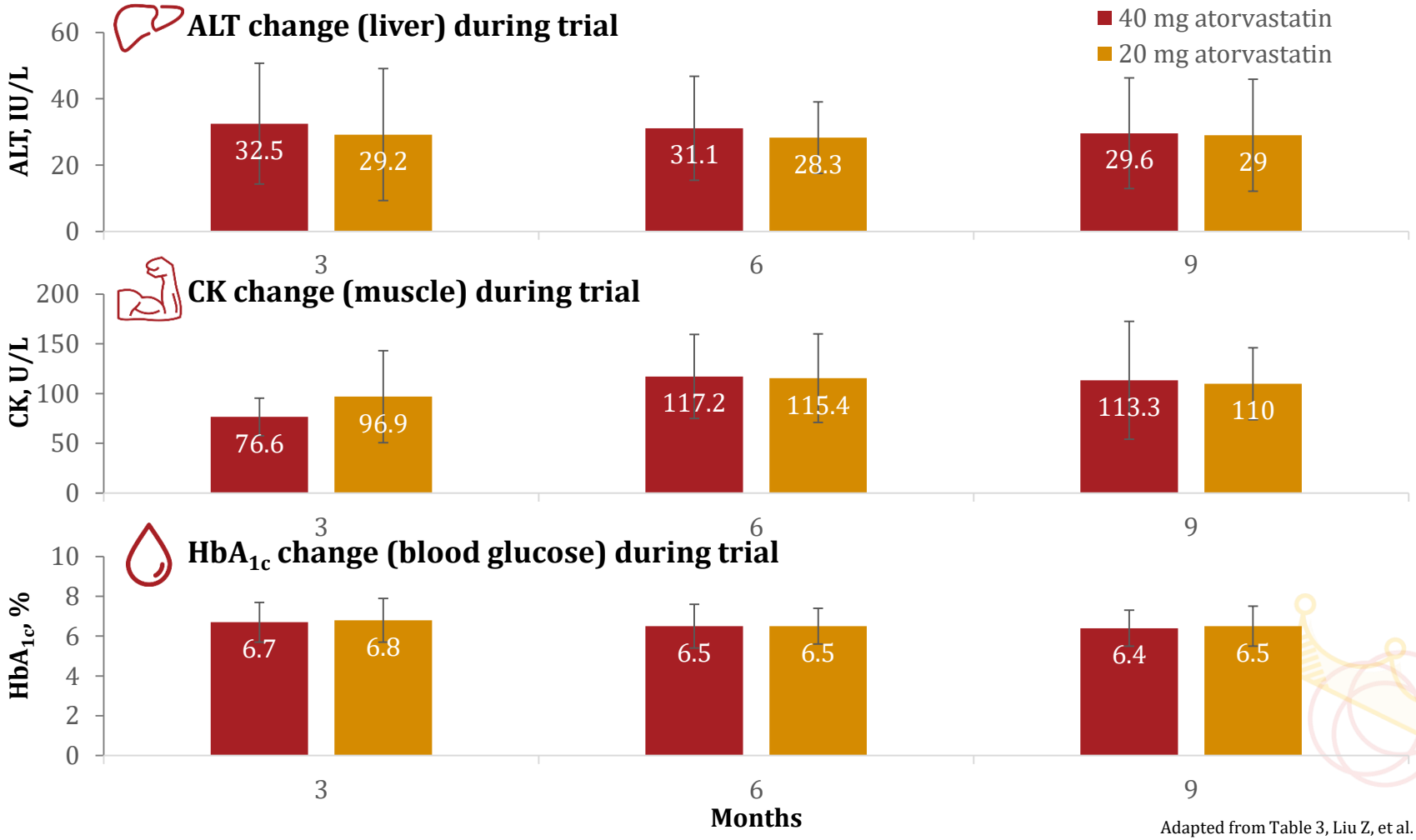


Adapted from Table 2, Liu Z, et al. 2016

MACE, major adverse cardiovascular events; MI, myocardial infarction.

Liu Z, et al. Int J Cardiol. 2016;222:22–26.

The rates of adverse events were no significantly different between 40mg and 20mg atorvastatin



Adapted from Table 3, Liu Z, et al. 2016

ALT, alanine aminotransferase; CK, creatine kinase;

Liu Z, et al. Int J Cardiol. 2016;222:22–26.

Conclusions

Patients with **ACS** and **diabetes mellitus**

+

Long-term high intensity atorvastatin

89.9 %
Treatment goal achievement
LDL-C < 70 mg/dL

42.5%
MACE
compared with moderate intensity atorvastatin

55.7%
Spontaneous MI
compared with moderate intensity atorvastatin

Safety


Liver ✓


Muscle ✓


Blood glucose ✓

High intensity atorvastatin not only can significant LDL-C lowering properties but also potent antioxidant and anti-inflammatory functions.

ACS, acute coronary syndrome; MACE, major adverse cardiovascular events; MI, myocardial infarction.

Liu Z, et al. Int J Cardiol. 2016;222:22–26.

ESC recommends LDL-C reduction ≥50% from baseline and a LDL-C goal of <55 mg/dL in very high-risk patients for secondary prevention

Definition of very-high risk patients

1

Documented ASCVD, either clinical or unequivocal on imaging

Documented ASCVD

- Previous ACS (MI or unstable angina)
- Stable angina
- Coronary revascularization (PCI, CABG, and other arterial revascularization procedures)
- Stroke and TIA
- Peripheral arterial disease

Unequivocally documented ASCVD

Findings that are known to be predictive of clinical events, such as significant plaque on:

- Coronary angiography
- CT scan (multivessel coronary disease with two major epicardial arteries having >50% stenosis)
- Carotid ultrasound

2

DM with target organ damage*, or at least three major risk factors, or early onset of T1DM of long duration (>20 years)

3

Severe CKD

(eGFR <**30** mL/min/1.73 m^2)

4

Calculated SCORE **>_10% for 10-year risk of fatal CVD**

5

FH with ASCVD or with another major risk factor

*Target organ damage is defined as microalbuminuria, retinopathy, or neuropathy.

Mach F, et al. Eur Heart J. 2019 Aug 31. pii: ehz455.

ESC recommends early initiation of high dose statin in all ACS patients, regardless of LDL-C level

EAS ESC European Society of Cardiology

Recommendations for lipid-lowering therapy in very high-risk patients with ACS

Recommendations	Class of recommendation	Level of evidence
In all **ACS patients without any contraindication or definite history of intolerance**, it is recommended that **high-dose statin therapy is initiated or continued as early as possible, regardless of initial LDL-C values**. [438,440,442.]	I	A

438-Early intensive vs a delayed conservative simvastatin strategy in patients with acute coronary syndromes: phase Z of the A to Z trial. JAMA 2004;292:1307-1316.
440-Early and late benefits of high dose atorvastatin in patients with acute coronary syndromes: results from the **PROVE IT-TIMI 22 trial.** J Am Coll Cardiol 2005;46:14051410.
442-Effects of atorvastatin on early recurrent ischemic events in acute coronary syndromes: the **MIRACL study**: a randomized controlled trial. JAMA 2001;285:17111718.

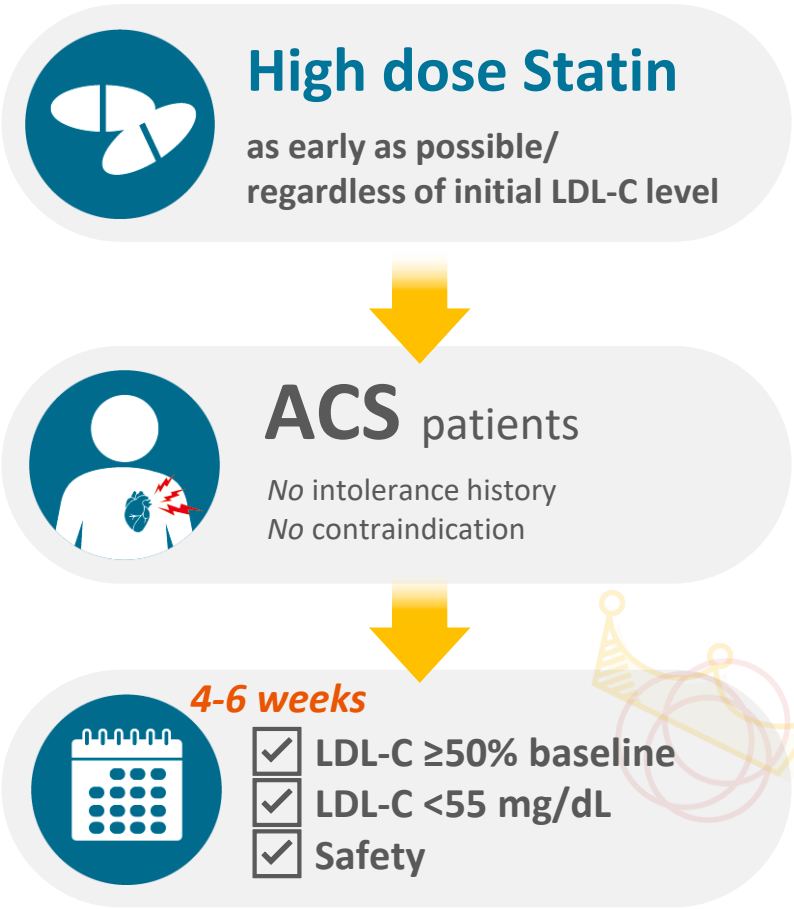
ACS. acute coronary syndromes.

Mach F, et al. Atherosclerosis. 2019 Aug 31. pii: S0021-9150(19)31459-5.

Patients with ACS (1/2)

Recommendations for lipid-lowering therapy in very-high-risk patients with ACS

Recommendations	Class	Level
In all ACS patients without any contraindication or definite history of intolerance, it is recommended that high-dose statin therapy is initiated or continued as early as possible, regardless of initial LDL-C values.	I	A
Lipid levels should be re-evaluated 4-6 weeks after ACS to determine whether a reduction of ≥50% from baseline and goal levels of LDL- C <55 mg/dL have been achieved. Safety issues need to be assessed at this time and statin treatment doses adapted accordingly.	IIa	C



ACS, acute coronary syndrome; LDL-C, low-density lipoprotein cholesterol.

Mach F, et al. Eur Heart J. 2019.

Patients with ACS (2/2)

Recommendations for lipid-lowering therapy in very-high-risk patients with ACS

Recommendations	Class	Level
If the LDL-C goal is not achieved after 4-6 weeks with the maximally tolerated statin dose, combination with ezetimibe is recommended.	I	B
If the LDL-C goal is not achieved after 4-6 weeks despite maximal tolerated statin therapy and ezetimibe, the addition of a PCSK9 inhibitor is recommended.	I	B

ACS, acute coronary syndrome; LDL-C, low-density lipoprotein cholesterol; PCSK9, proprotein convertase subtilisin/kexin type 9.

Mach F, et al. Eur Heart J. 2019.

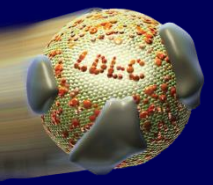
2017 Taiwan Lipid Guidelines for High Risk Patients

LDL-C targets in ACS, CAD, and PAD.

Disease category	LDL-C target
Primary target	
ACS	LDL-C < 70 mg/dL
ACS + DM	LDL-C < 55 mg/dL can be considered
Stable CAD	LDL < 70 mg/dL
PAD	LDL < 100 mg/dL
PAD + CAD	LDL < 70 mg/dL
Secondary target	
ACS, stable CAD, PAD with TG >200 mg/dL	Non-HDL-C < 100 mg/dL

LDL-C, low-density lipoprotein cholesterol; **ACS,** acute coronary syndrome; **CAD,** coronary artery disease; **PAD,** peripheral arterial disease; **DM,** diabetes mellitus; **HDL-C,** high-density lipoprotein cholesterol; **TG,** triglyceride.

Li YH, et al. J Formos Med Assoc. 2017 Apr;116(4):217-248.



2017 Taiwan Lipid Guidelines for High Risk Patients: LDL-C treatment algorithm for ACS patients

ACS

Start statin or statin/ezetimibe for all

LDL-C < 70 mg/dL ?

Yes

Keep treatment

DM ?

Yes

LDL-C < 55 mg/dL can be considered

No

Keep treatment

No

Consider patients clinical features

Intolerable

Use high intensity statin ± ezetimibe

Use non high intensity statin ± ezetimibe

LDL-C < 70 mg/dL ?

Yes

Keep treatment

No

Add PCSK9 inhibitor

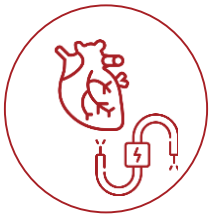
SATW.ALI.17.02.0028b

降血脂藥品給付規定修訂 - 民國 108 年 2 月 1 日修訂

健保降血脂藥物給付規定，針對 **高風險患者** 已放寬規定

急性冠狀動脈症候群病史

或



曾接受心導管介入治療

或

外科冠動脈搭橋手術之冠狀動脈粥狀硬化患者

起始藥物治療血脂值：

LDL-C ≥ **70** mg/dL

血脂目標值：

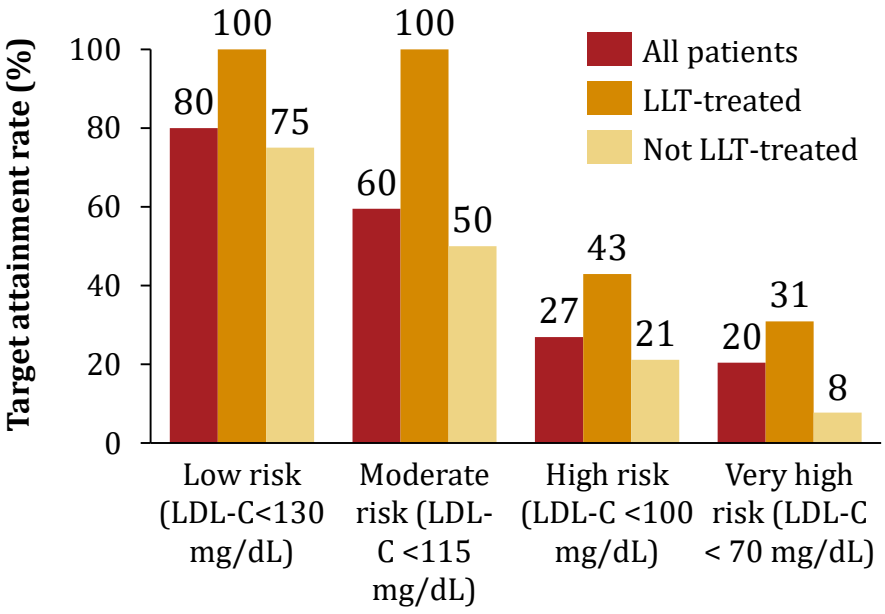
LDL-C < **70** mg/dL

中央健保署網站公告

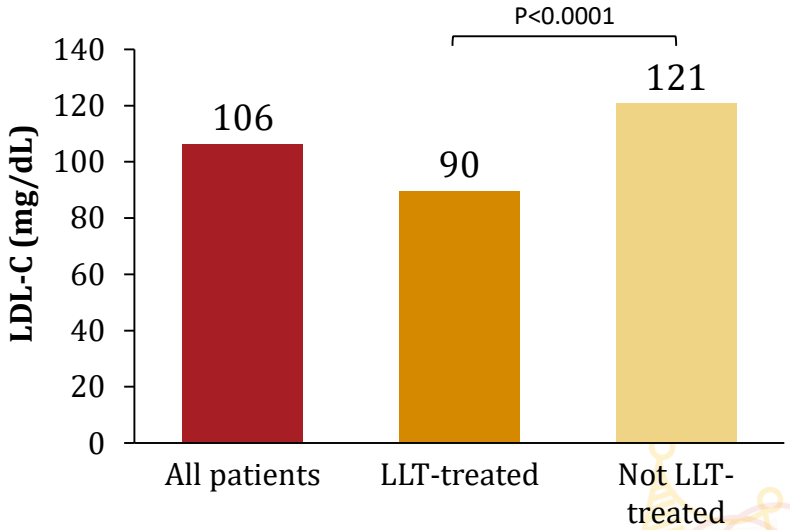
LDL-C target attainment rates were low in ACS patients

- The multinational, observational Dyslipidemia International Study (DYSIS) II included patients hospitalized for an ACS in Hong Kong and Taiwan.

LDL-C target attainment rate prior to admission



LDL-C profile at hospital admission

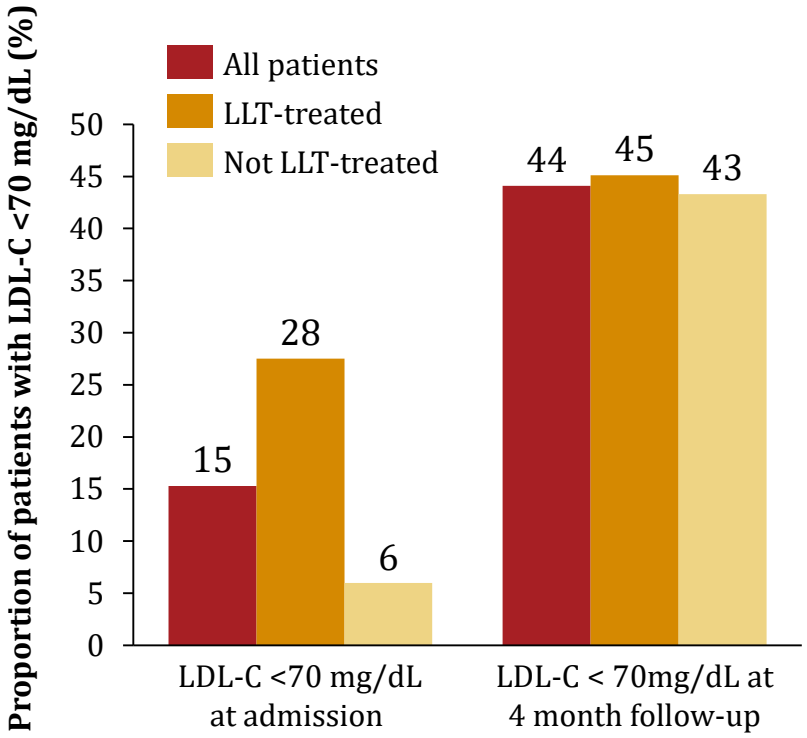


ACS, acute coronary syndrome; CV, cardiovascular; LDL-C, low-density lipoprotein cholesterol; LLT, lipid-lowering therapy

Yan BP, Chiang FT, Ambegaonkar B, et al. Int J Cardiol. 2018;265:1–5.

Low LDL-C target attainment may result from inadequate treatment

Target attainment rates were low in all patients regardless treatments



Statin dose remained low in treated patients

	Admission (N=270)	4-month follow-up (N=269)
LLT	46.3%	88.4%
Statin therapy	46.1%	87.6%
Statin daily dose in atorvastatin equivalent	**14 mg/day**	**18 mg/day**
Statin monotherapy	92.8%	96.5%
Non-statin monotherapy	0.8%	0.9%
Statin + ezetimibe	4.0%	1.3%
Statin + other non-statin	2.4%	1.3%

ACS, acute coronary syndrome; LDL-C, low-density lipoprotein cholesterol; LLT, lipid-lowering therapy

Yan BP, Chiang FT, Ambegaonkar B, et al. Int J Cardiol. 2018;265:1–5.

Case 1

- 68 y/o man, smoker
- HTN, dyslipidemia (LDL 181)
- 109.1 crescendo angina, ACS admit via ER
  3-V CAD, CTO of RCA, DES to LAD/Lcx
- Initial Rx Lipitor 20 mg 1# qd

累積報告查詢 <uIspGroupRpt>

病 歷 號 0035888938 袁松德 生日:0400710 男

查詢(Q) 預覽(P) 離開(X)

報告日期 1060116 ~ 1090716 全部 包含血糖One Touch

累積報告 預設 Y軸 報告日

血液 | 血液凝固 | 血液生化 | 心超 | 肺功能 | 其他

血液生化 報告日時:1090102 0712 *異常值 ★危險值 ●更改報告

報告日	BUN	CRE	GFR	CHOL	TG	LDL-C	HDL-C	CHOL/HDL	Na	K	CPK	CKMB mas	AST	ALT	Troponi	溶血	脂血	醫檢證號
1081225	15	0.87	87*						134*	3.7			17	17		0	0	019982
1081226				154	77	108.6	35.2*	4.38								0	0	020172
1081226											50							019630
1081226												1.8						019630
1081226															0.0302*			019630
1090102											83							020172
1090102												4.7						020172
1090102																		020172
1090330		0.90	84*			102.5				4.5				19		0	0	005171
1090427						85.7												
1090525						58.0								28				013069

Lipitor 20 mg 1# qd, LDL 181-109 (40%)

Lipitor 20 mg 2# qd, LDL 103-86 (17%)

Lipitor 20 mg 2# qd, ezetimibe 10 mg LDL 86-58 (33%)

基本 | web | 抽審 | Memo | 只看報告 | EEC | 療癒評估 1

病人自述無藥物過敏史

身份 40 負擔 A20 卡號 療程 0 類別 4 體重 健保

用藥史 | 重複原因 | 隱藏 | 詳細

近期用(抗凝血藥06/22)
院內及雲端藥歷 餘藥天數
Famotidine 20mg/Tab [4天]
Clopidogrel 75mg/Tab [4天]
Aspirin 100mg/Cap [4天]
Nicorandil 5mg/Tab [4天]
Losartan 50mg/Tab [4天]
AtorvaStatin 20mg/Tab…[4天]
Ezetimibe 10mg/Tab [4天]

診斷

402.00	I11.9	411.1	I20.0	272.4	E78.5		
Hypertensive heart disease without heart failure/高血壓性心臟病，無心臟衰竭(I11.9)		Unstable angina/不穩定心絞痛(I20.0)		Hyperlipidemia, unspecified/高血脂症(E78.5)			

徵候

BH:159.8cm, BW:63.4kg, BMI:24.8, BP:157/79mmHg, pulse:100/min, BH:160.1cm, BW:63.8kg, BMI:24.8, BP:178/83mmHg, pulse:101/min, BH:159.2cm, BW:65.4kg, BMI:25.8, BH:160cm, BW:63.6kg, BMI:24.8, 150/76 86, clear BS, RHB, Gr 2/6 systolic murmur over LSB; 109.1.6 BP:171/85mmHg, pulse:120/min, 109.2.3 BP:149/71mmHg, pulse:104/min, 109.3.30 BP:181/85mmHg, pulse:116/min, 109.4.27 BP:154/83mmHg, pulse:92/min, 109.6.22 BP:137/75mmHg, pulse:87/min,

歷史

BP: / mmHg Pulse: /min
BH: 估 cm BW: 估 kg
BT: ℃ 帶入 重載資料
腰 cm 頭 cm BMI:

診間訊息
(吸菸註記)

sort	醫令代碼	註	醫令學名及單位	部位/劑量	說明	每次	單位	用法	天	途徑	時間	1	重覆	候
1	TATORVA2		AtorvaStatin 20mg/Tab	[20mg]		1.00	Tab/Tat	QD	28	PO	PC	28.0	4天	B
2	TFAMOTI4		Famotidine 20mg/Tab	[20mg]		1.00	Tab/Tat	QD	28	PO	PC	28.0	4天	A
3	TCLOPID		Clopidogrel 75mg/Tab	[75mg]		1.00	Tab/Tat	QD	28	PO	PC	28.0	4天	B
	TASPI100		Aspirin 100mg/Cap	[100mg]		1.00	Cap/Cap	QN	28	PO	PC	28.0	4天	A
	TNICORA		Nicorandil 5mg/Tab	[5mg]		1.00	Tab/Tat	QN	28	PO	PC	28.0	4天	B
食	TLOSART		Losartan 50mg/Tab	[25mg]		0.50	Tab/Tat	QD	28	PO	PC	14.0	4天	B
	TEZETIM		Ezetimibe 10mg/Tab	[10mg]		1.00	Tab/Tat	QD	28	PO	PC	28.0	4天	B

- Lipitor 20 mg 1# qd
  LDL 181- 109 40%

- Lipitor 20 mg 2# qd
  LDL 103-86 16%

- Lipitor 20 mg 2#/ezetibime 10 mg
  LDL 86 -58 mg (33%)

Case 2

- 78 y/o man, ex-smoker
- HTN, dyslipidemia (Initial LDL 178)
- MK 100 chest pain visit ER

  ACS with unstable angina, 1-V CAD s/p DES to LAD

累積報告查詢 <dispGroup.pl>

病 歷 號 0019613935 吳俊明 生日:0310120 男

查詢(Q) 預覽(P) 離開(X)

報告日期 1020116 ~ 1090716 全部 包含血糖One Touch

累積報告 預設 Y軸 報告日

血液 | 血液生化 | 腫瘤標記與賀爾蒙 | 特殊生化 | 尿液 | 糞便 | 免疫 | 病毒 | 血庫 | 血糖 | 心超 | One Touch | 其他

血液生化 報告日時:1020228 1124 *異常值 ★危險值 ●更改報告

報告日	Glu-AC	BUN	CRE	GFR	UA	CHOL	TG	LDL	LDL-C	HDL-C	CHOL/HDL	Na	K	T-Bil.	D-Bil.	hsCRP	AST	CPK	CKMB mas	ALT	ALP	LDH	hCRP	Alb.BCG	Glo.	溶血	脂血	黃膽
1020228																			1.0									
1020228	125*	12	0.88	85								131*				0.40	20								0	0	0
1020228													3.0*												0	0	0
1020228																		79									
1030512			0.92	81*																					0	0	
1050108			0.76*	100								127*					40*								0	0	
1050108													3.4*												0	0	
1050804			0.91	81*								136	4.0												0	0	
1051206			1.04	70*																							
1060209			0.79	95					177.8*											28					0	0	
1060209	100																										
1060307									105.5											29							
1060508	104*																										
1060508			0.83	90		162	97	91.00		51.6	3.14		3.8							24					0	0	
1060824												133*	4.1												0	0	
1061211			0.86	86*					94.9				4.0												0	0	
1070328			0.86	86*					91.6			127*	3.7							22					0	0	
1070504												136													0	0	
1070601	100																										
1070601			0.87	85*					82.1			135	4.0							18					0	0	
1071114	99																										
1071114			0.85	87*					85.6				4.3												0	0	
1080311		15	0.90	82*	5.1	168	115		100.0								21			21					0	0	
1080311	94																										
1080725			0.78	96																							
1081017	103*																										
1081017		7	0.85	87*	4.6	185	131		104.9	57.0	3.25			0.79	0.15		20	125		21	51	142	0.09	4.4	2.5*	0	0	
1081021									72.9											17								
1081212									35.3											19								
1090529									53.3											24								

- 102-2 Lipitor 20 mg 1# qd LDL 178
- 105-12 Lipitor 20 mg 1.5# qd
- 106-2 Lipitor 20 mg 2# qd LDL 105
- 108-10 Lipitor 20 mg/Ezetimibe 10 mg LDL 73
- 108-11/12 Plus Praluent (PCSK9) LDL 35

- 109-5 Lipitor 20 mg/Ezetimibe 10 mg LDL 53

基本 | web | 抽番 | Memo | 只看報告 上次 連3慢箋未回院 | EEC | 病人自述無藥物過敏史

身份 40 負擔 A12 卡號 療程 0 類別 4 體重 健保 修改率 0.0 %

診斷

411.1	I20.0	R/O	272.4	E78.4	R/O	535.400	K29.60	R/O	401.9	I11.9	R/O
Unstable angina/不穩定心絞痛(I20.0)			Other hyperlipidemia/其他高血脂症(E78.4)			Other gastritis without bleeding/其他胃炎未伴有出血(K29.60)			Hypertensive heart disease without heart failure/高血壓性心臟病，無心臟衰竭(I11.9)		

780.52	G47.00	R/O	300.00	F41.9	R/O
Insomnia, unspecified/非特定的失眠症(G47.00)			Anxiety disorder, unspecified/非特定的焦慮症(F41.9)		

用藥史 | 重複原因 | 隱藏 | 詳細

近期用(抗凝血藥06/19)
院內及雲端藥歷 篩藥天數
Doxazosin 4mg/Tab [42天]連
Oxybutynin E.R 5mg/Ta…[42天]連
Dutasteride 0.5mg/Cap…[42天]連
Desmopressin acetate丑[42天]連
Mosapride 5mg/Tab [39天]連
Amtrel Tab複方Amlodip…[39天]連
AtorvaStatin 20mg/Tab…[39天]連
Ezetimibe 10mg/Tab [39天]連
Zolpidem F.C. 10mg/T…[39天]連

病史

[Lacin study] 97.5.20 Dyslipidemia, ex-smoker for 1 year; dizziness when turning head; TCVGH/Chung-Shan ENT follow up [normal told]; insomnia on Rx 0.25# hs; chol 192 chol 227; depression on anxiety Rx; HR 40-60 bpm sBP 140, LDL 104; insomnia; 100.6.21 110-140/70-80 40-60, LDL 97 640 MD:CT: Ca 5, PUD -; 100.10.27 1-V CAD, LAD s/p PTCA with stenting (DES x 1), LDL 98; edema avoid CCB; Holter 2100 APCs; HR 33 at night; insomnia; BZD from psychiatrist; theophylline to increase HR mosapride; LDL 116, 2nd hand-smoker 101.11.6 cath: no ISR; LDL 89, 140+ at home; K 3.0; 102.4.11 LDL 100; K 4.2; LDL 105; avoid much egg; bil legs edema; [CMUH: doxaben 4 mg], intermittent claudication; echo: vein insufficiency, suggest elastic stocking; 120-140; BPH want to hold aspirin; BPH on doxaben at CMUH; LDL 85; [ativan-ineffective] insomnia; LDL 86; acid regurgitation 104.1.22 sBP 140-150, LDL 87; preterax 1# bid 1 108.6.3 keloid over prior bx site/left breast; sBP 110-130; LDL 100; 108.8.26 Ca 13, 25% stenosis, r/o S7 stent filling defect with 50% ISR [confirmed by radiologist]; bilateral nipple pain; hold aldactone first; f/u echo, recath if necessary (abnormal wall motion, angina..etc) 108.9.23 no angina; echo pending; sBP 110-130; nipple pain after holding aldactone; 108.10.21 higher am BP 140+; LDL 105; 108.11.18 sBP 110-130; 108.12.16 sBP 110-140; LDL 105-73-35; higher am BP; 109.2.10 ditto; stent cell therapy; LDL 35 after PCSK9, discontined; 109.4.6 ditto; 109.6.1 LDL 53; sBP 120; int claudication;

歷史

BP: / mmHg Pulse: /min

BH: 估 cm BW: 估 kg

BT: ℃ 帶入 重載資料

腰 cm 頭 cm BMI:

診間訊息

sort	醫令代碼	註	醫令學名及單位	部位/劑量	說明	每次	單位	用法	天	途徑	時間	1	重覆	候
1	TATORVA2		AtorvaStatin 20mg/Tab	[40mg]		2.00	Tab/Tat	QD	28	PO	PC	56.0	39天	B
2	TCLOPID	自	Clopidogrel 75mg/Tab	[75mg]		1.00	Tab/Tat	QD	28	PO	PC	28.0		B
3	TZOLPI2		Zolpidem F.C. 10mg/Tab	[10mg]	病情需	1.00	Tab/Tat	HS	28	PO	PC	28.0	39天	A
	TESOMEP	自	Esomeprazole(錠劑) 40mg/Tab	[40mg]		1.00	Tab/Tat	QD	28	PO	PC	28.0		B
	TMOSAPR1		Mosapride 5mg/Tab	[5mg]		1.00	Tab/Tat	QD	28	PO	PC	28.0	39天	A
食	TAMTREL		Amtrel Tab複方Amlodipine5/Benazepril10mg	[1Tab]	1# qd, 1	1.00	Tab/Tat	BID	28	PO	PC	56.0	39天	A
	TEZETIM		Ezetimibe 10mg/Tab	[10mg]		1.00	Tab/Tat	QD	28	PO	PC	28.0	39天	B

Case 3

- 65 woman (298490)
- Endometrial cancer s/p C/T, R/T, DM (initial HbA1c 14.6%), dyslipidemia (LDL 371), CAD, CHF (EF 50%) PAOD, Rutherford 4 ABI 0.46/0.79
- MK 104 PAOD s/p BMS to RSFA, POBA to BTK
- MK 104 ACS admit from ER

  3-V CAD, CTO of Lcx/RCA s/p DES to RCA,

  DES to LM-LAD, failed PCI to Lcx

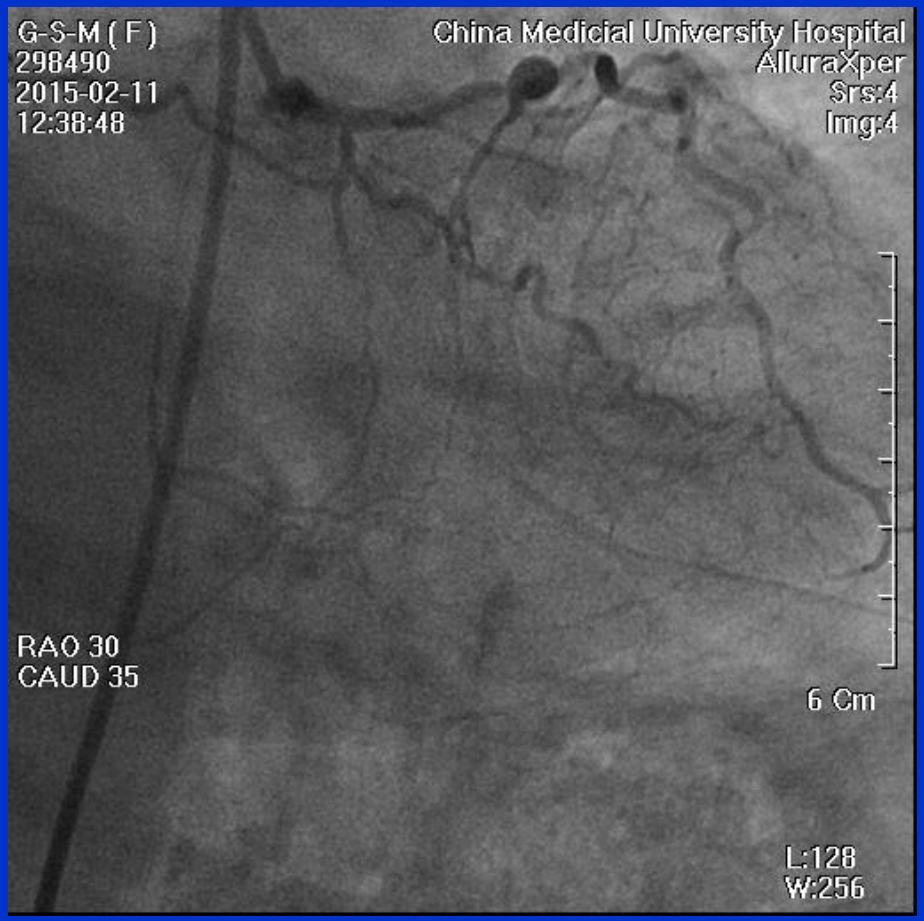
Medication

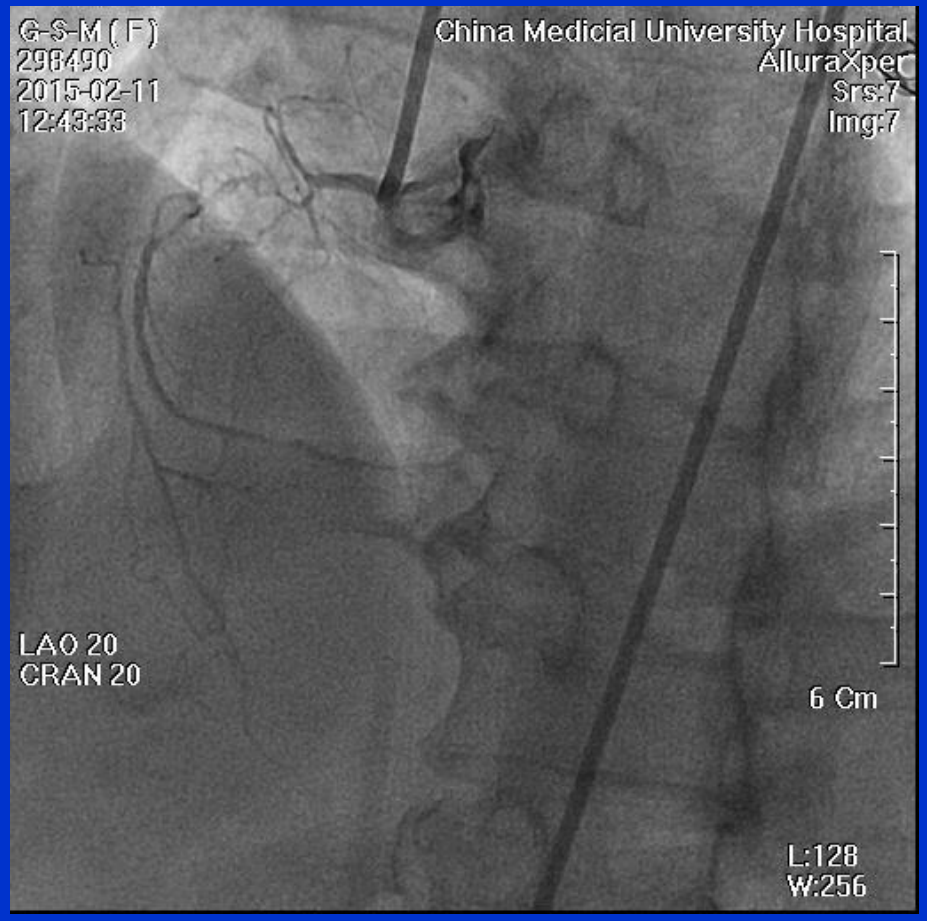
Aspirin 1# qd, Plavix 1# qd,
Inderal 1# bid, furosemide 1# qd,
amaryl-M 1# tid, vytorin 2# hs,
alirocumab 1# q2w

Taiwan FH diagnostic criteria

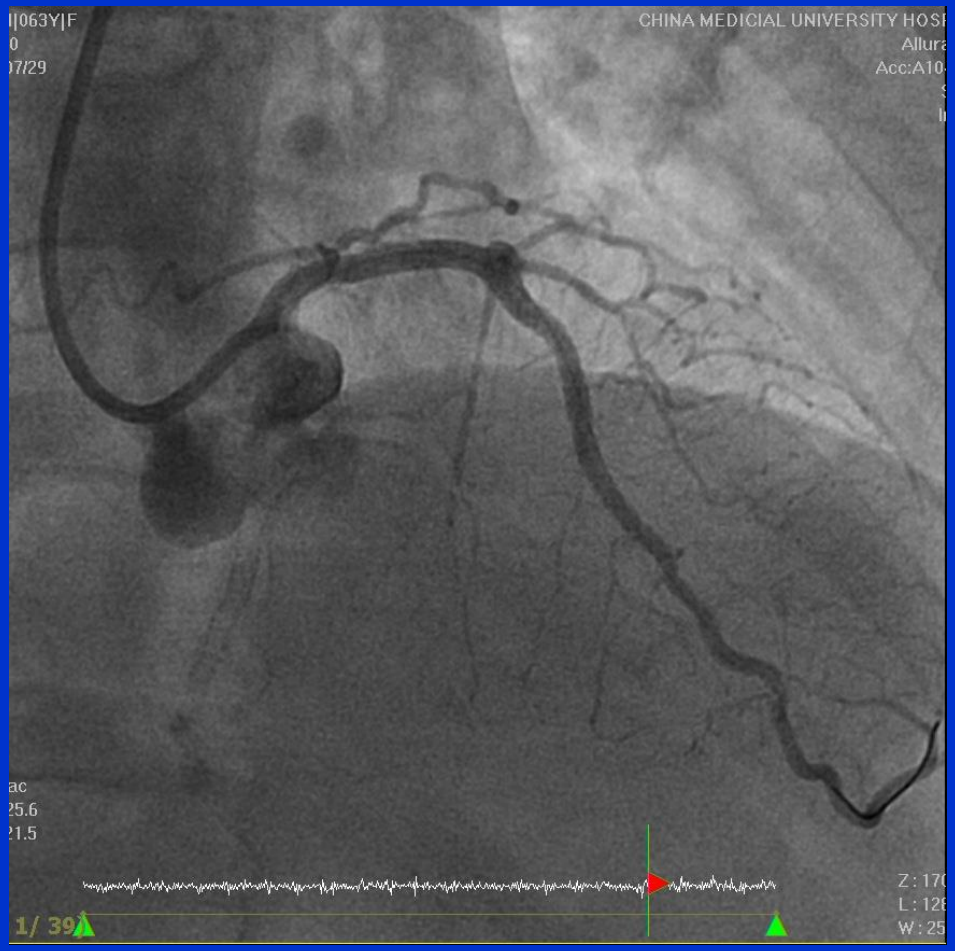
Parameter	Points
Familial history	
First-degree relative with early vascular/coronary disease (male < 45 years, female < 55 years) OR	1
Adult first-degree relative with LDL-C > 160mg/dL	
First-degree relative with xanthoma and/or corneal arcus OR	2
First-degree relative <18 years with LDL-C > 130 mg/dL	
Clinical history	
Patient with early coronary artery disease (male < 45 years, female < 55 years)	2
Patient with early cerebral or peripheral arterial disease (male < 45 years, female < 55 years)	1
Physical exam	
Xanthoma	6
Corneal arcus (<45 years)	4
Level of LDL-C (mg/dL)	
≥ 330	8
250 - 329	5
190 - 249	3
155 - 189	1
Genetic Testing	
Presence of functional mutation of *LDL-R*, *ApoB-100* or *PCSK9* gene	8
Diagnostic of FH	
Definite FH	> 8 points
Probable FH	6 - 8 points
Possible FH	3 - 5 points

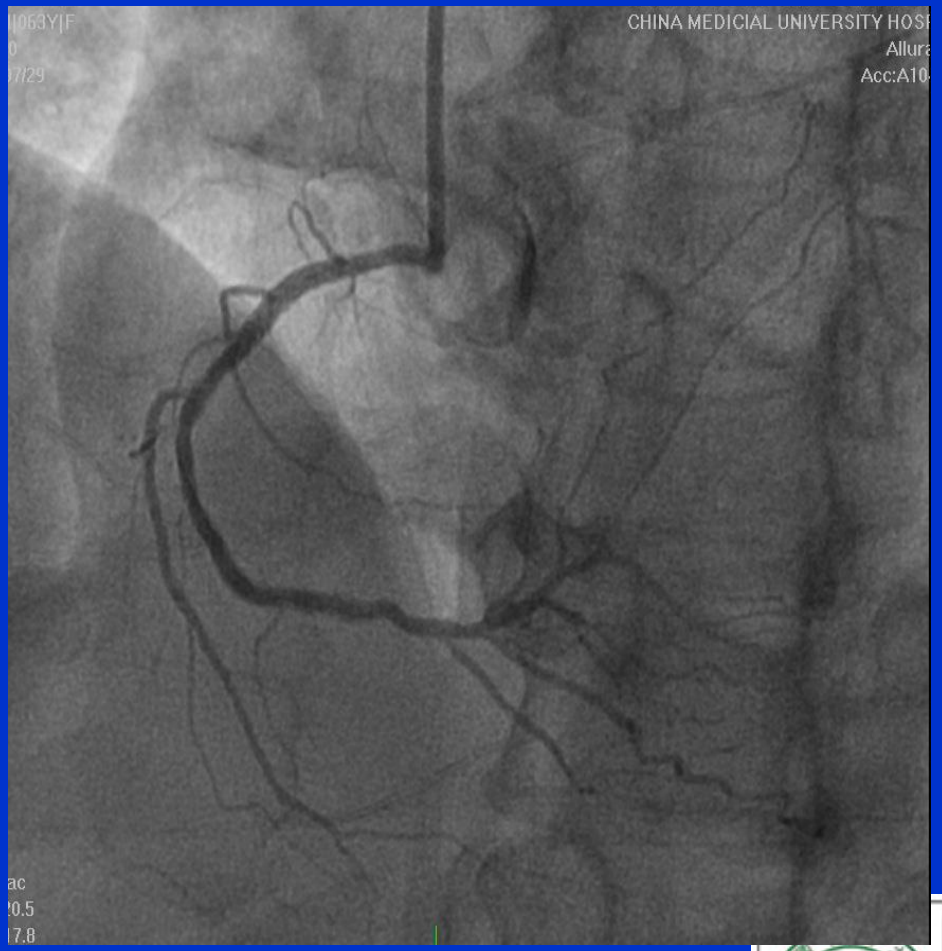
3-V CAD, CTO of Lcx/RCA





DES to LM/LAD, RCA





報告日	Glu-AC	BUN	CRE	GFR	CHOL	TG	LDL	LDL-C	HDL-C	CHOL/HDL	Na	K	AST	ALT	hCRP
1031031														18	
1031031	327*														
1031031			1.14	48*	462*	244*	371.00		42.2	10.95					
1031211	76														
1031211								201.8*						20	
1040108	72														
1040202		25	0.97	58*									18	17	
1040210	211*														
1040210		24	0.93	61*							140	4.4	14	16	
1040211	184*														
1040211					215*	132	142.70	147.7*	45.9	4.68					
1040211	187*														
1040212	190*														
1040212	314*														
1040212															3.40*
1040212			1.38*	39*											
1040213	238*														
1040213	297*														
1040213	297*														
1040214	144*														
1040309			1.00	56*								4.0			
1040309	96														
1040309								144.5*						14	

Vytorin 1# hs

雙擊滑鼠左鍵查看該張報告內容
滑鼠右鍵可查看曲線圖

報告日		Glu-AC	Glu-PC	BUN	CRE	GFR	UA	CHOL	TG	LDL	LDL-C	HDL-C	CHOL/HDL	Na	K	hCRP	AST
1040608	1040608										140.3*						
1040622	1040622			22	1.03	54*											22
1040728	1040728			28*	1.28	42*								136	4.5		19
1040728	1040728	414*															
1040729	1040729	248*															
1040729	1040729							196	143	132.80	137.3*	4.6*	5.66				
1040729	1040729	404*															
1040730	1040730	293*															
1040730	1040730																
1040730	1040730																
1040730	1040730																
1040902	1040902										135.7*						
1040902	1040902	112*															
1040902	1040902				0.95	59*											
1041102	1041102	213*															
1041102	1041102										138.7*						
1041102	1041102			21													19
1041130	1041130	118*															
1041130	1041130				1.26*	43*		195	173*	122.80	124.0	7.6	5.19				
1050125	1050125	160*															
1050222	1050222	94															
1050222	1050222				1.06	52*											
1050222	1050222										255.4*						
1050222	1050222																16
1050321	1050321										132.9*						
1050321	1050321	112*															
1050516	1050516	92															
1050516	1050516										125.7						
1050715	1050715				1.09	50*											
1050802	1050802	144*															
1050802	1050802				1.09	50*					126.0						
1050802	1050802							204*	265*	115.80		5.2	5.80				

Vytorin 1.5# hs

Diarrhea hold Vytorin

Vytorin 2 # hs

檢驗日	Glu-AC	BUN	CRE	GFR	CHOL	TG	LDL	LDL-C	HDL-C	CHOL/HDL	Na	K	AST	ALT
10500803	144*													
10500823			1.09	50*				126.0						
10500825					204*	265*	115.80		55.2	5.80				
10510103	183*													
10510103		33*	1.10	50*									29	20
10511123	152*													
10511123			0.94	60*	194	241*	106.50	120.6	59.3	4.94				17
10601231	144*													
10602171	77													
10602171			1.05	53*				53.3						
10602171					112*	118	48.40		40.0	2.80				19
10603091														
10604201		25	1.08	51*							142	4.9		
10604231	152*													

Vytorin 2# hs

Alirocumab 1# q2w

	LDL	Rx
103.10.31	371	Vytorin 1#hs
103.12.11	202	
104.2.11	148	RSFA BMS
104.3.9	145	RCA DES
104.6.8	140	(63%)
104.7.29	137	DES LM/LAD Failed PCI Lcx
104.9.2	135	Vytorin 1.5# hs

	LDL	Rx
104.9.2	135	Vytorin 1.5# hs
104.11.2	139	
104.11.30	124	
105.2.22	255	Diarrhea, hold Rx
105.3.21	133	Vytorin 2# hs
105.5.16	126	
105.8.2	126	(8%)

	LDL	Rx
105.11.23	121	Vytorin 2# hs
106.1.23		Alirocumab/vytorin
106.2.17	53	
106.4.28	48	(60%)

Case 4

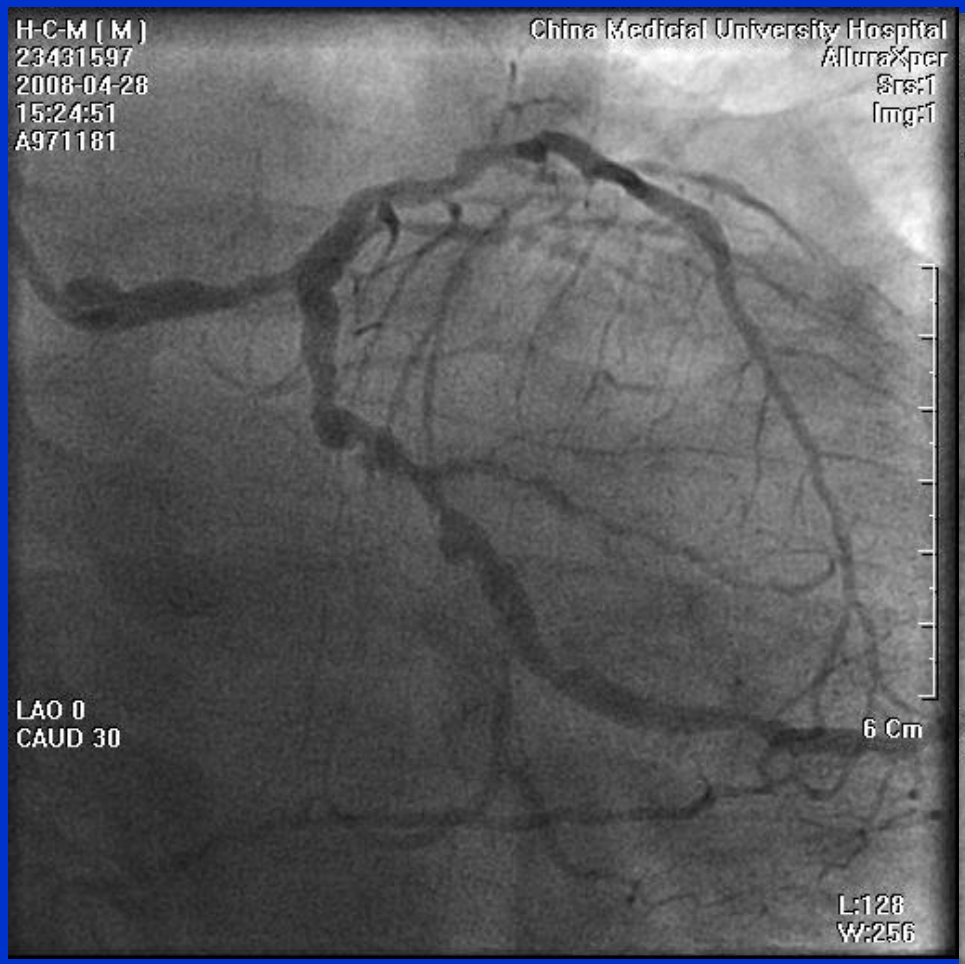
- 57 man (23431597), smoker
- DM, dyslipidemia (LDL 207, already on Lipitor 10 mg), IHD with CHF (EF 44%), CRF (Cr 2.5-3.0), PAOD
- MK 94 AMI, inf wall s/p PCI at other hospital, then staged PCI twice
- MK 97 failed PCI, refuse CABG, referred for PCI; LM-3-V CAD s/p DES to LM-LAD, Lcx; failed PCI to RCA
- MK 98 LM ostial DES

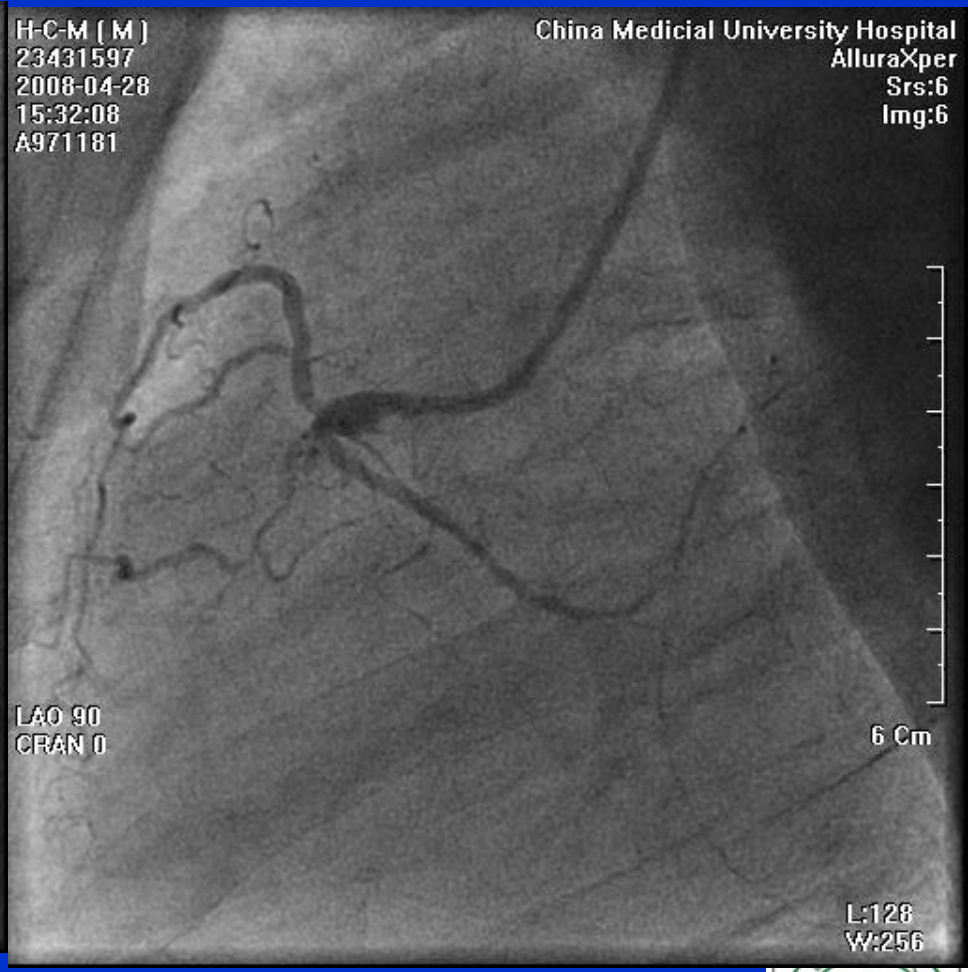
- MK 102 AMI with ISR of Lcx s/p POBA
- Rx: aspirin 1# qd, carvedilol 25 mg 0.5# qd, cilostazol 50 mg 1# qd, nicorandil 5 mg 0.5# bid, losartan 1# qd, insulin, vytorin 2# hs, alirocumab 1# q2w

Taiwan FH diagnostic criteria

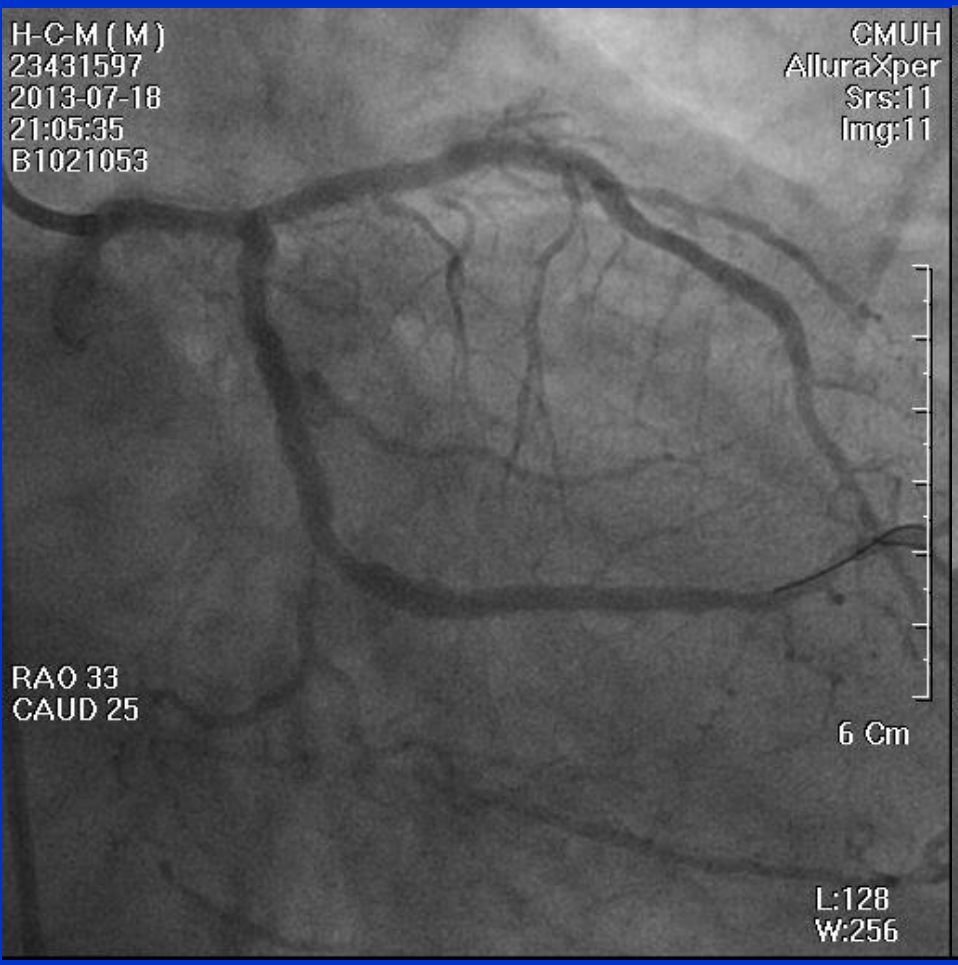
Parameter	Points
Familial history	
First-degree relative with early vascular/coronary disease (male < 45 years, female < 55 years) OR	1
Adult first-degree relative with LDL-C > 160mg/dL	
First-degree relative with xanthoma and/or corneal arcus OR	2
First-degree relative <18 years with LDL-C > 130 mg/dL	
Clinical history	
Patient with early coronary artery disease (male < 45 years, female < 55 years)	2
Patient with early cerebral or peripheral arterial disease (male < 45 years, female < 55 years)	1
Physical exam	
Xanthoma	6
Corneal arcus (<45 years)	4
Level of LDL-C (mg/dL)	
≥ 330	8
250 - 329	5
190 - 249	3
155 - 189	1
Genetic Testing	
Presence of functional mutation of *LDL-R*, *ApoB-100* or *PCSK9* gene	8
Diagnostic of FH	
Definite FH	> 8 points
Probable FH	6 - 8 points
Possible FH	3 - 5 points

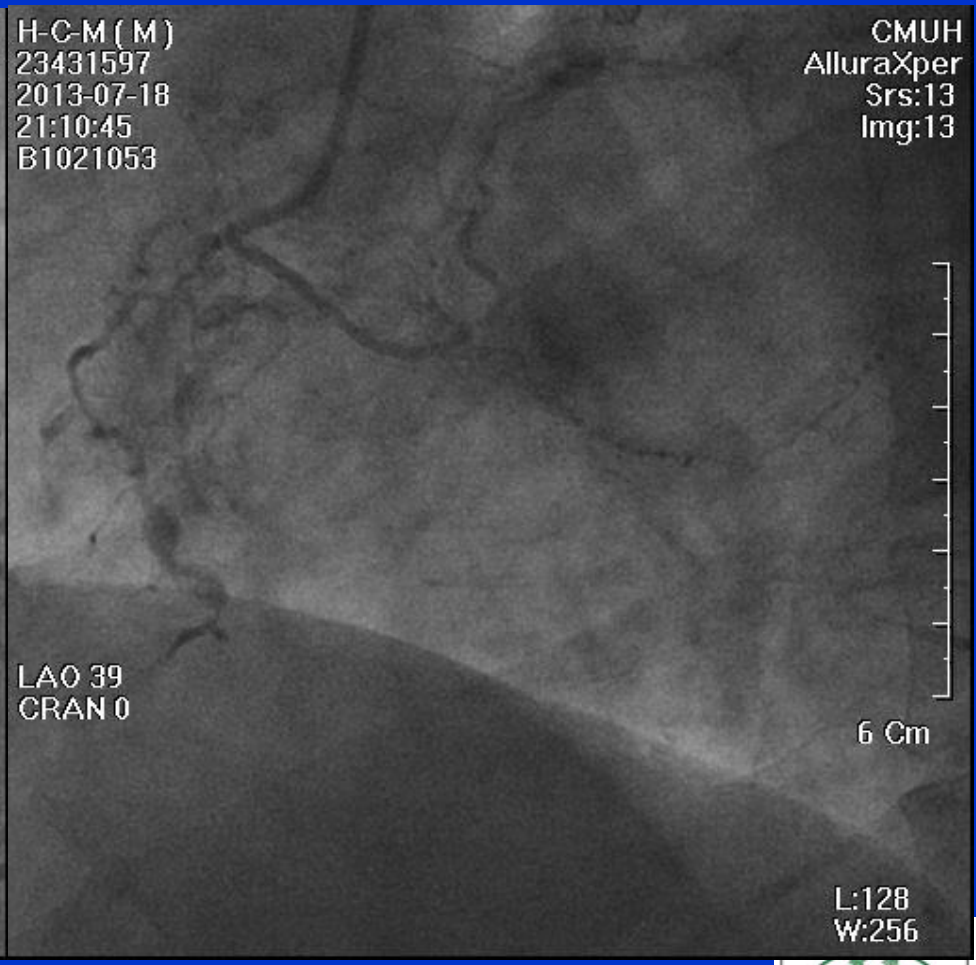
MK 97 LM, 3V CAD, CTO RCA



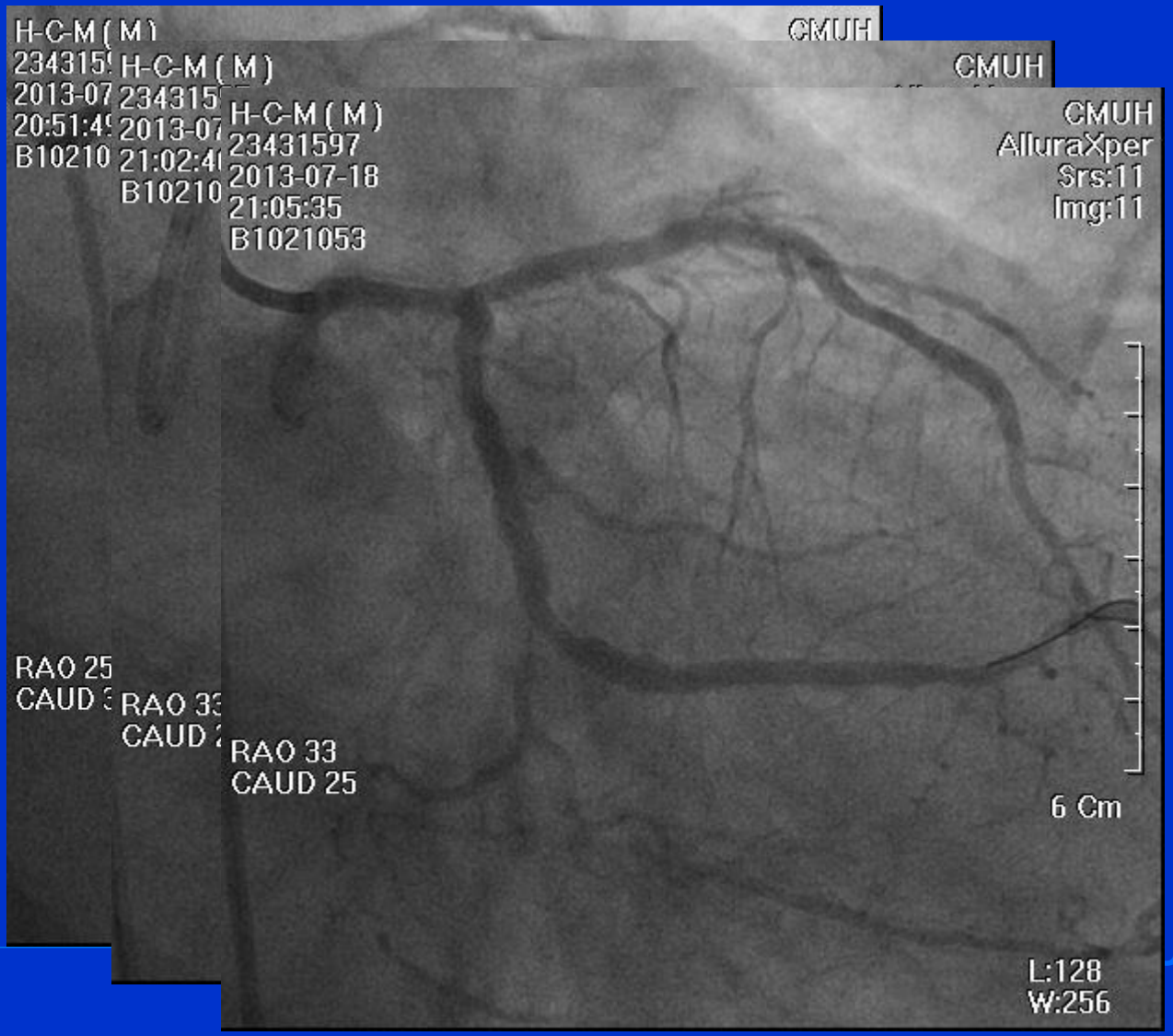


DES to LM/LAD/Lcx; failed PCI to CTO of RCA

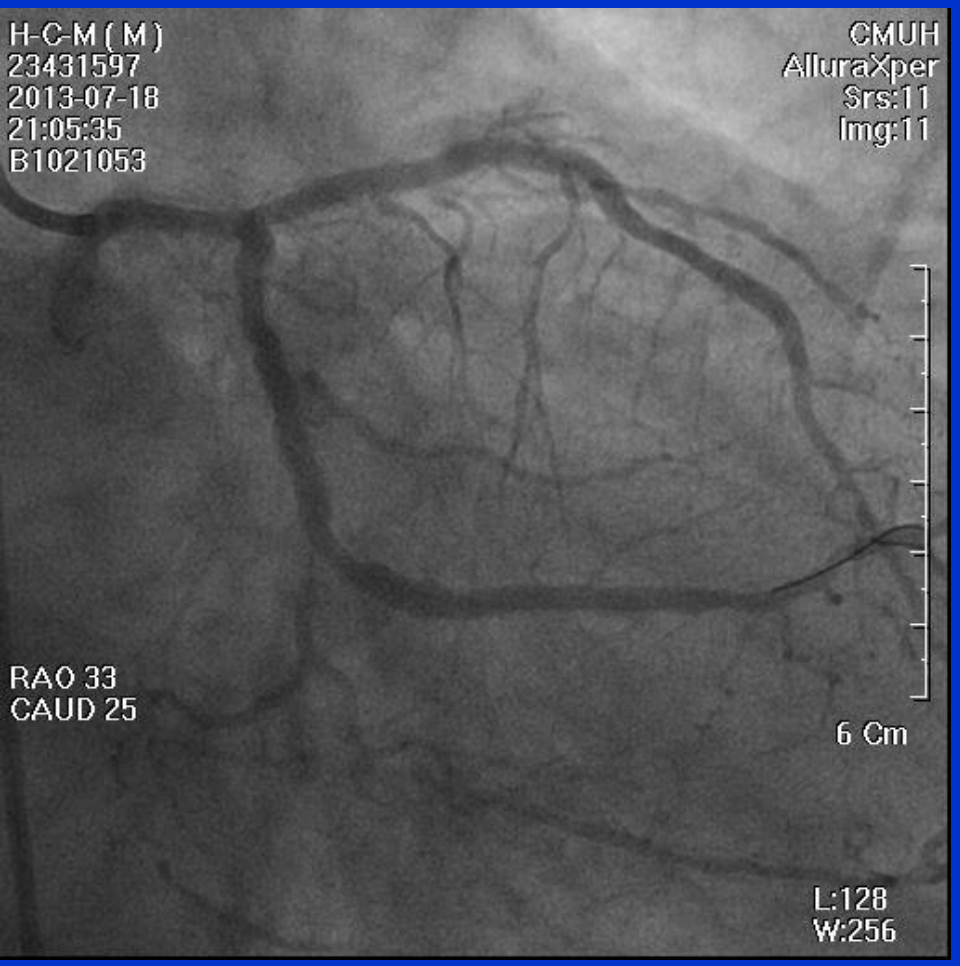


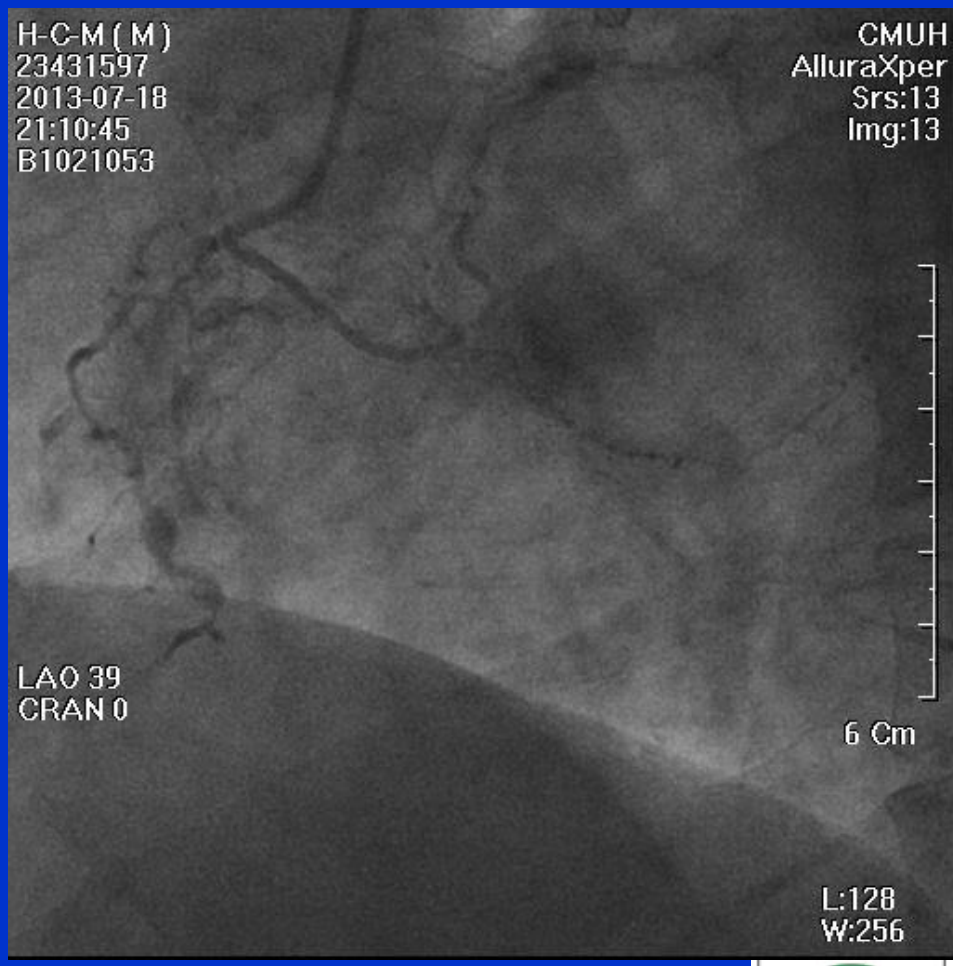


MK 102 ISR of Lcx s/p POBA



Follow up Angio





	TC/LDL/TG	Rx
97.4.2	304/207/329	Lipitor 10 mg 1#
97.9.17	307/-/435	Failed PCI to RCA
97.11.3	276/-/281	DES to LM/LAD/Lx
98.2.23	-/146/179	
98.7.31	249/-/-	DES to LM
98.12.1	237/-/241	Vytorin 1# hs (33%)
99.1.14	203/-/-	Vytorin 2# hs

	TC/LDL/TG	Rx
99.1.14	203/-/-	Vytorin 2# hs
99.2.20	182/95/-	(10%)
99.10.26	247/-/-	
100.1.21	137	
100.4.8	96	
100.8.2	89	
100.10.29	113	

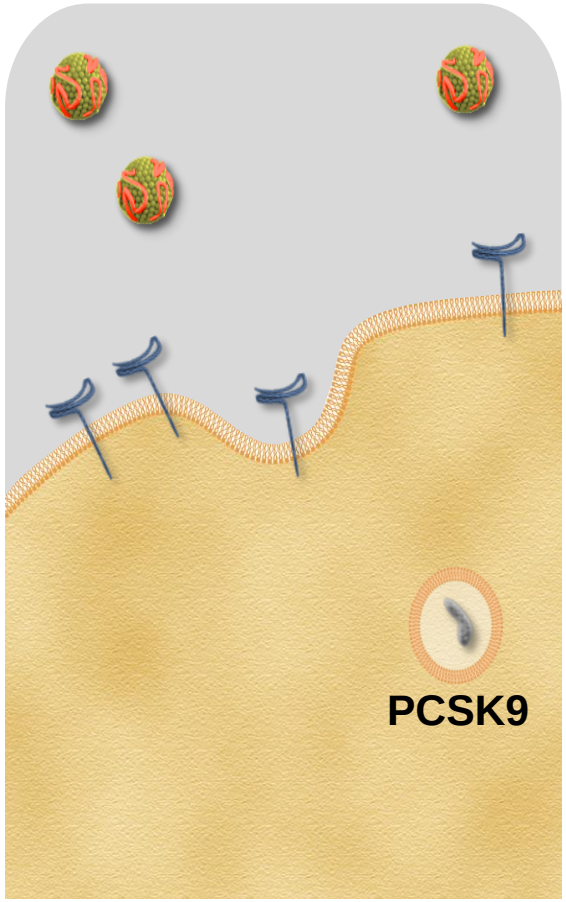
	TC/LDL/TG	Rx
100.11.24	186/-/-	Vytorin 2# hs
101.4.7	185/-/698	
101.5.21	100	
101.10.8	94	
102.3.25	135	
102.7.19	101	AMI, ISR Lx POBA
102.8.13	117	

	LDL	Rx
102.10.25	113	Vytorin 2# hs
103.7.29	83	
103.12.12	124	
104.3.16	110	
104.12.21	127	
105.2.22	140	
105.6.13	109	

	LDL	Rx
105.8.30	117	Vytorin 2# hs
105.10.11	102	Vytorin/Alirocumab
105.11.28	43	
106.2.13	28	(73%)
106.3.11	60	
106.5.8	44	

Emerging Dyslipidemia Treatment – PCSK9 inhibitor

PCSK9 Physiology and Inhibition by PCSK9 mab Injection



PCSK9=proprotein convertase subtilisin/kexin type 9.

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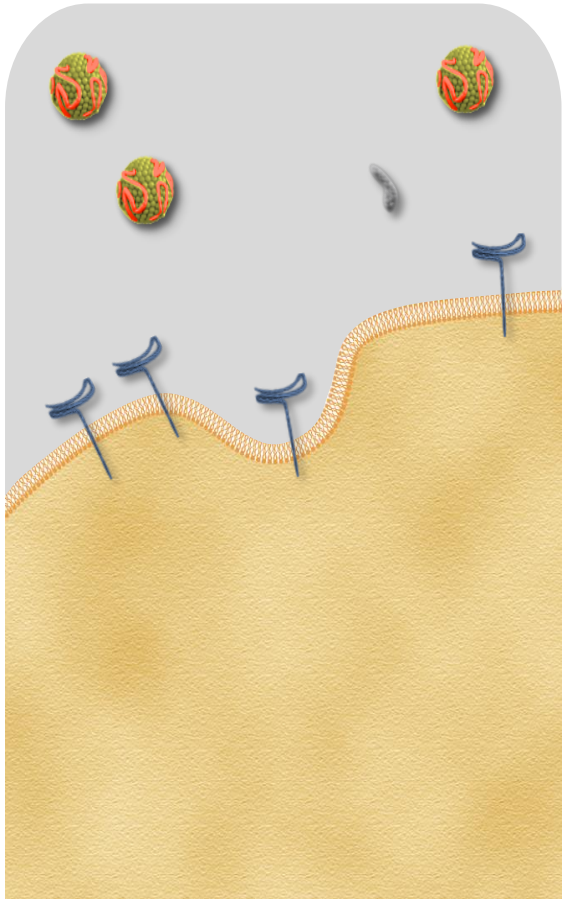
PCSK9 Physiology and Inhibition by PCSK9 mab Injection



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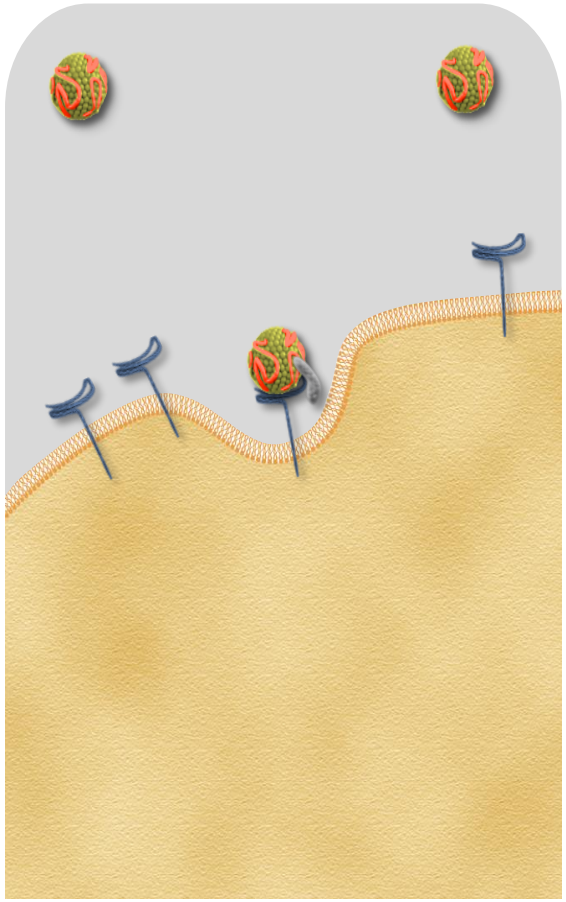
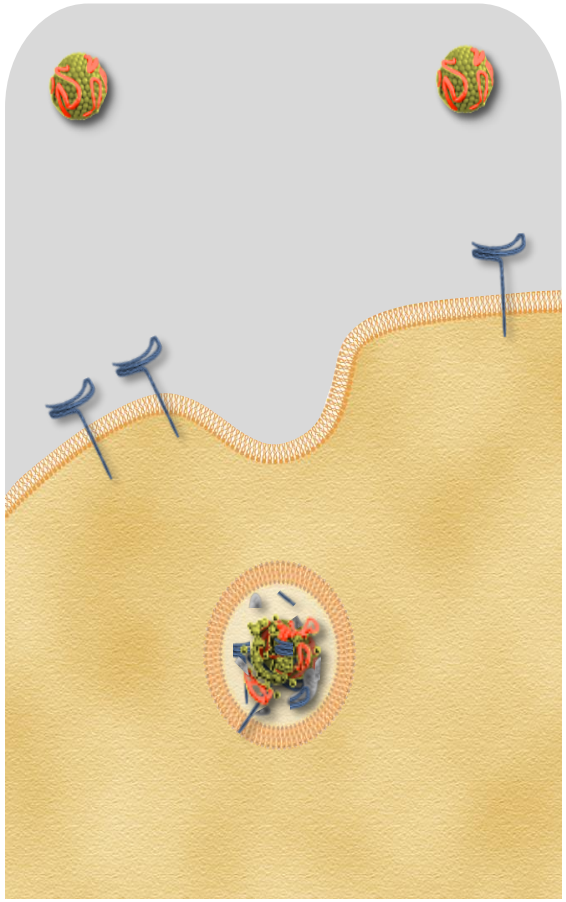
PCSK9 Physiology and Inhibition by PCSK9 mab Injection



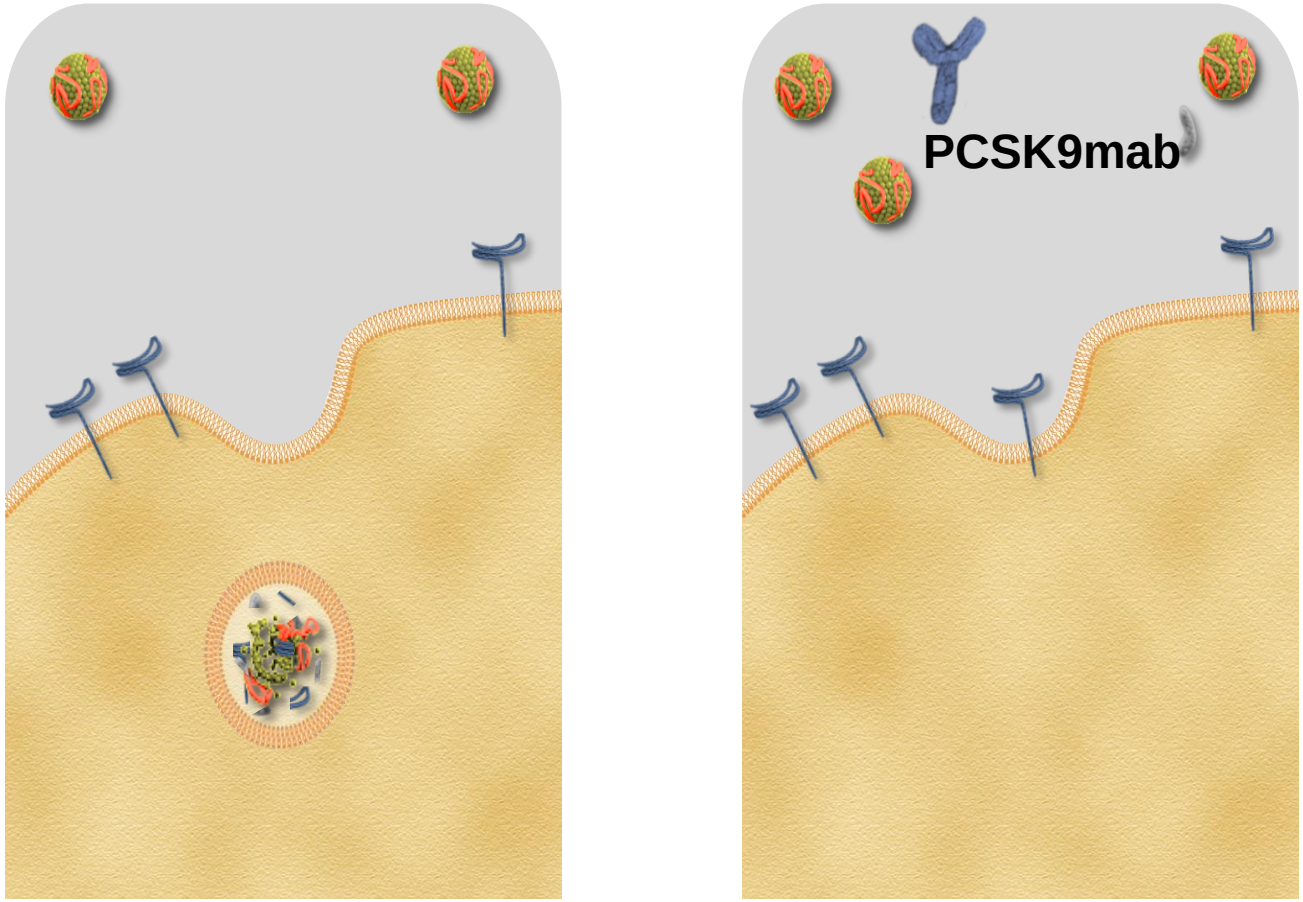
PCSK9=proprotein convertase subtilisin/kexin type 9.

PCSK9 Physiology and Inhibition by PCSK9 mAb Injection



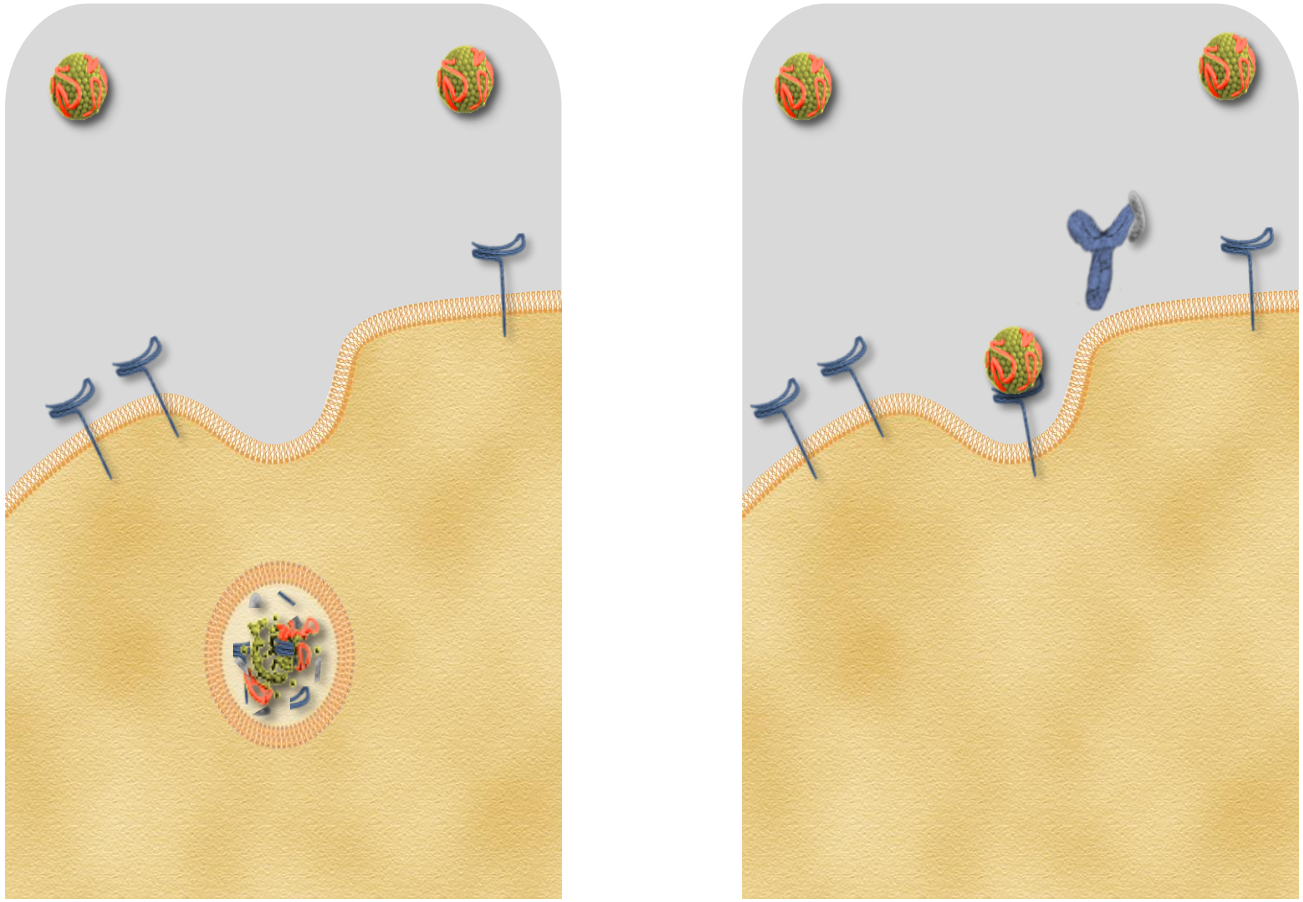
PCSK9=proprotein convertase subtilisin/kexin type 9.

PCSK9 Physiology and Inhibition by PCSK9 mAb Injection



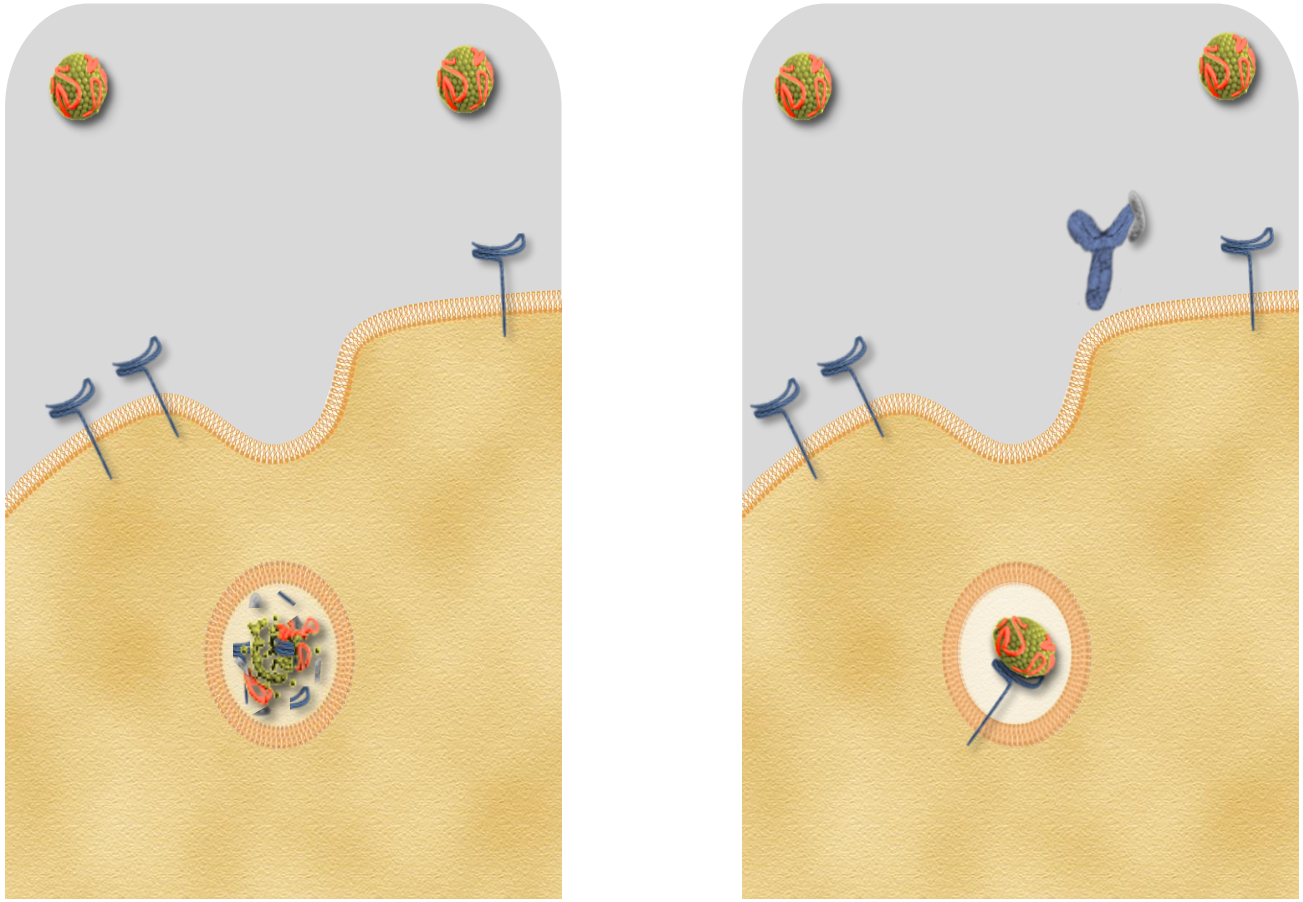
PCSK9=proprotein convertase subtilisin/kexin type 9.

PCSK9 Physiology and Inhibition by PCSK9 mAb Injection



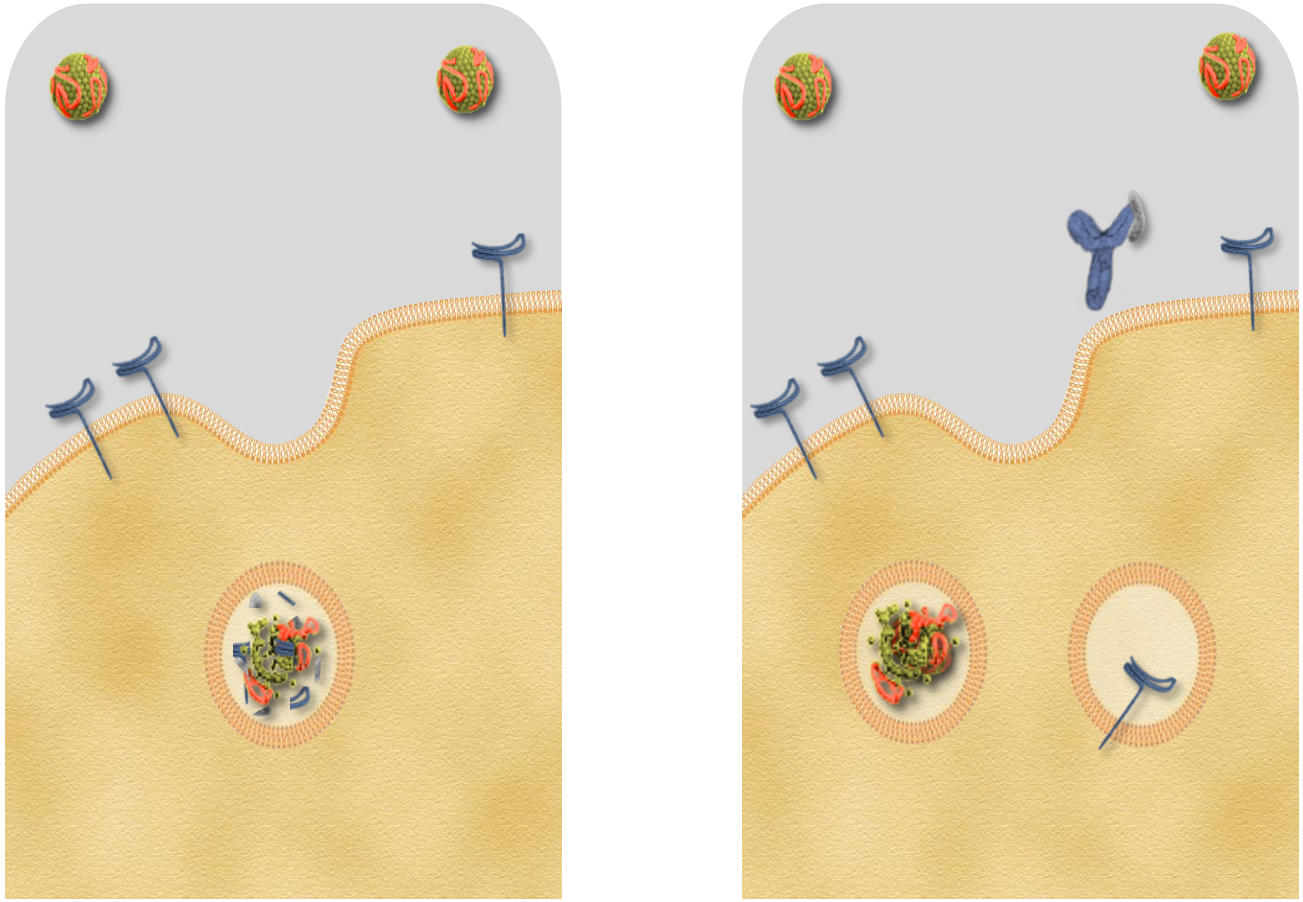
PCSK9=proprotein convertase subtilisin/kexin type 9.

PCSK9 Physiology and Inhibition by PCSK9 mAb Injection



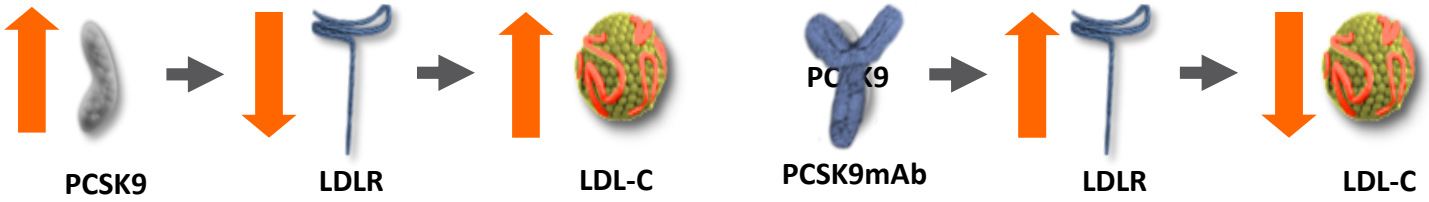
PCSK9=proprotein convertase subtilisin/kexin type 9.

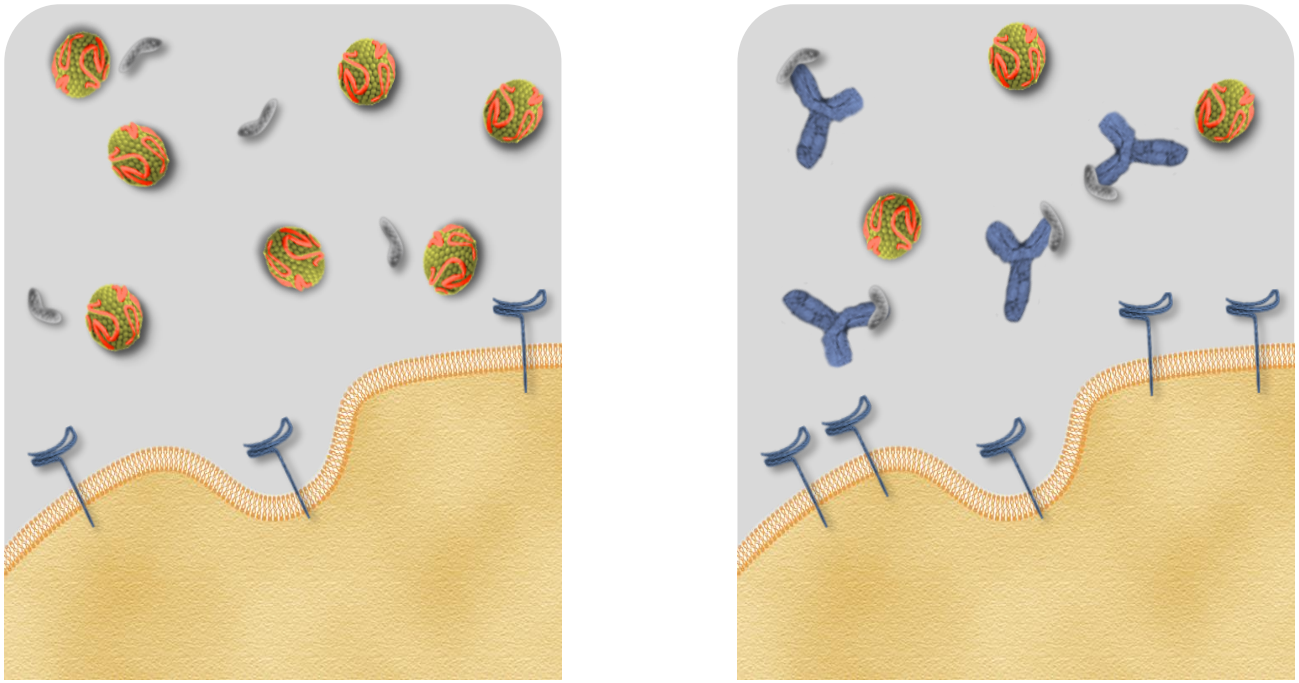
PCSK9 Physiology and Inhibition by PCSK9 mAb Injection



PCSK9=proprotein convertase subtilisin/kexin type 9.

PCSK9 Physiology and Inhibition by PCSK9 mAb





LDL-C=low-density lipoprotein cholesterol; LDLR=low-density lipoprotein receptor; PCSK9=proprotein convertase subtilisin/kexin type 9.

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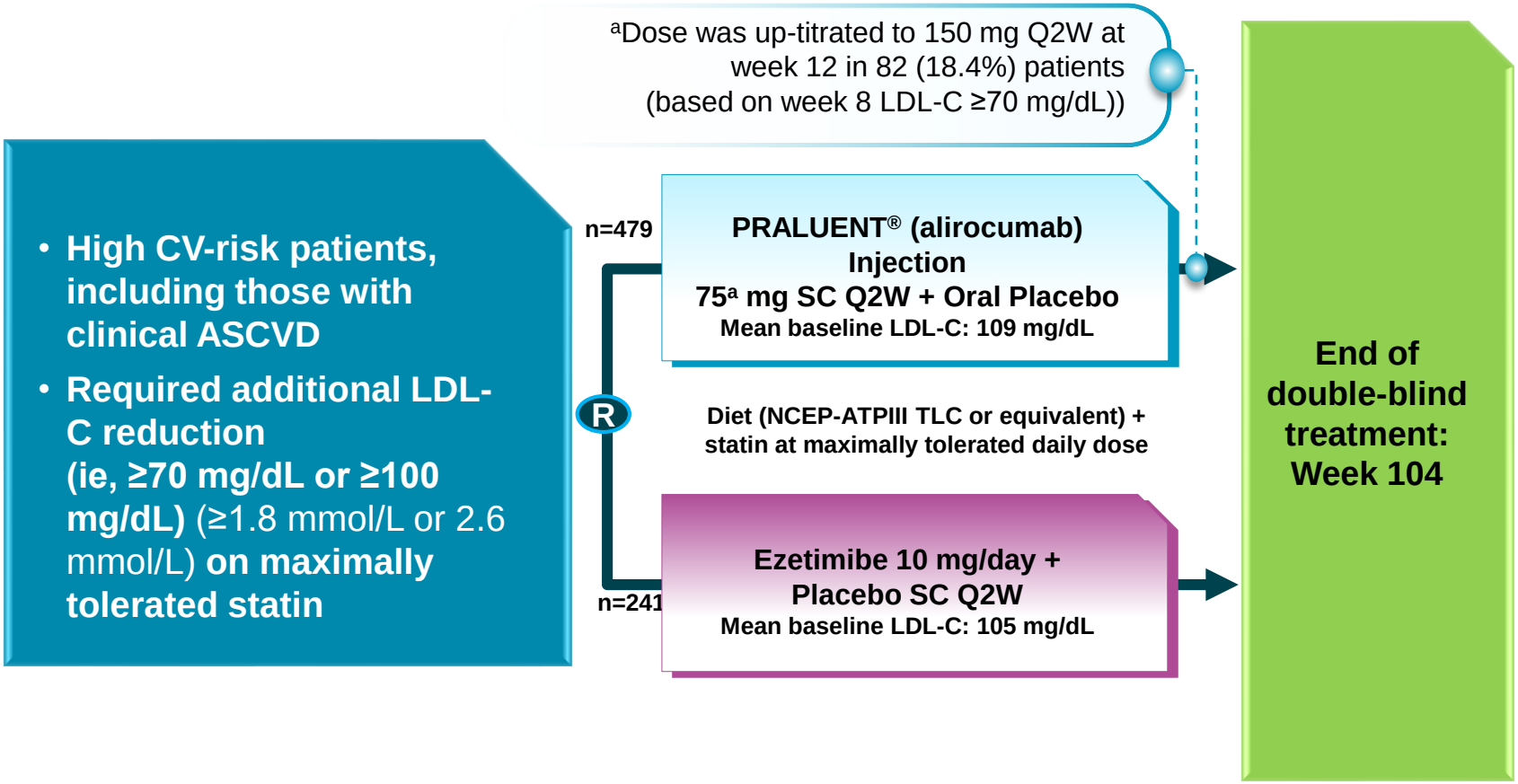
ODYSSEY COMBO II Study: Study Design[1,2]



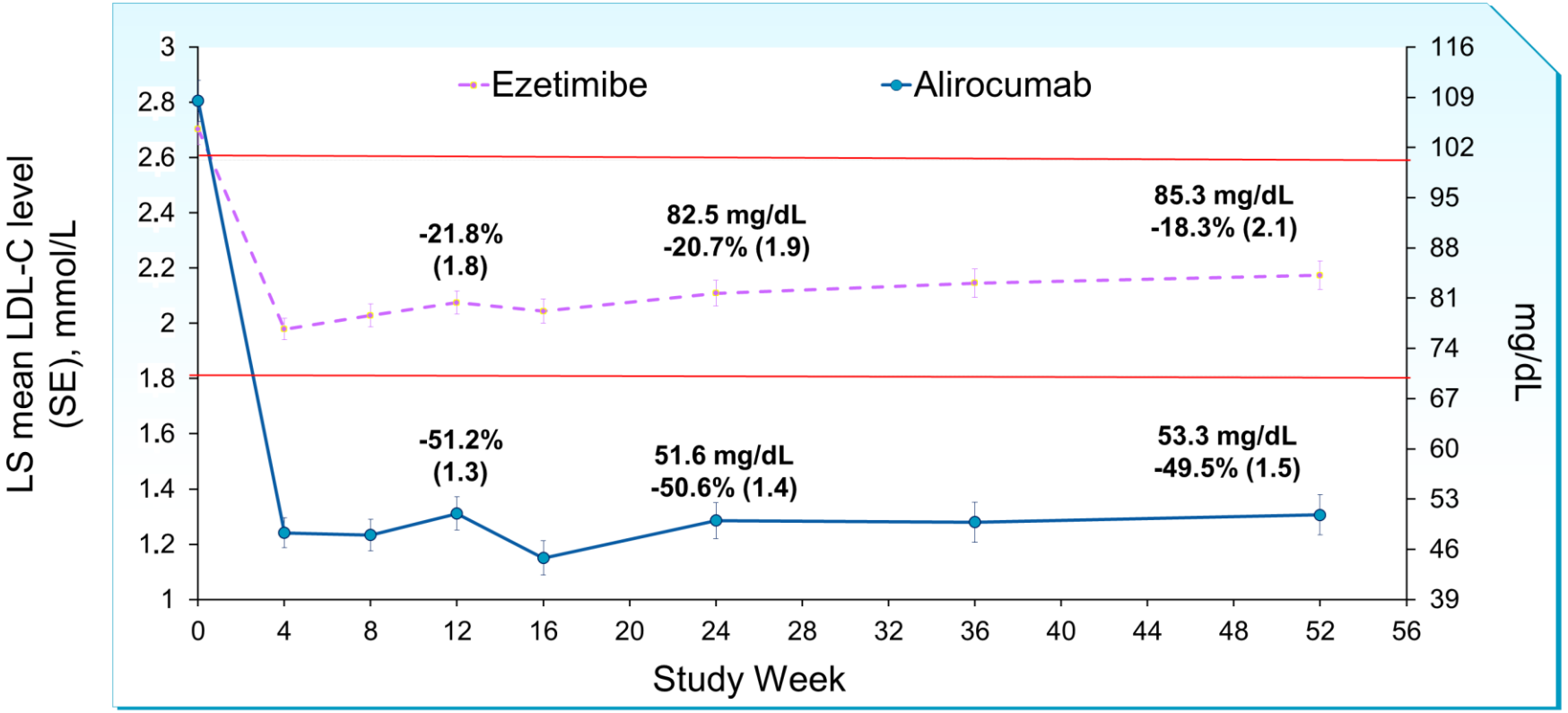
Primary endpoint: Mean LDL-C change from baseline at week 24.

CV=cardiovascular; LDL-C=low-density lipoprotein cholesterol; NCEP-ATPIII TLC=National Cholesterol Education Program Adult Treatment Panel III therapeutic lifestyle changes; Q2W=every 2 weeks; SC=subcutaneous.

1. Colhoun HM, et al. *BMC Cardiovasc Disord*. 2014;14:121; 2. Cannon CP, et al. *Eur Heart J*. 2015;36(19):1186-1194.

SATW.ALI.17.02.0028a SANOFI REGENERON

COMBO II: LDL-C Reduction Over 52 Weeks



At 24 weeks, the results did not differ qualitatively with regard to patient demographics (race, ethnicity, gender, age, BMI), region, moderate CKD, medical history, baseline total/free PCSK9 concentration, diabetes (personal history), intensity of statin treatment, or baseline lipid values.

In COMBO II, adverse reactions occurring in ≥5% of PRALUENT ® -treated patients and more frequently than with ezetimibe (at 52 weeks) were upper respiratory tract infection.

Adapted from Cannon CP, et al. *Eur Heart J*. 2015;36(19):1186-1194.

A Randomized, Double-Blind, Placebo-Controlled, Parallel Group Study to Evaluate the Efficacy and Safety of Alirocumab in High Cardiovascular Risk Patients with Hypercholesterolemia Not Adequately Controlled with Their Lipid-Modifying Therapy in South Korea and Taiwan (ODYSSEY KT Study)

- 199 Taiwanese and Korean patients with **high CV risks**
- Patients were required to have hypercholesterolemia that was not adequately controlled on stable max-tolerated statin therapy with or without other LLT

ODYSSEY KT Trial: Koh, Kwang K., et al. Journal of the American College of Cardiology, 2017, 69.11 Supplement: 1664

ODYSSEY KT Trial: Koh, Kwang K., et al. Journal of the American College of Cardiology, 2017, 69.11 Supplement: 1664.

ODYSSEY KT - Patients

Maximally Statin Therapy	Main Inclusion Criteria	Exclusion Criteria
Atorvastatin 40-80 mg daily	Hypercholesterolemia	Familial hypercholesterolemia • Homozygous • Heterozygous
Rosuvastatin 20 mg daily	Coronary heart disease (CHD) or CHD risk equivalents	
Simvastatin 40 mg daily	Not adequately controlled with a maximally tolerated daily dose of statin for at least 4 weeks	

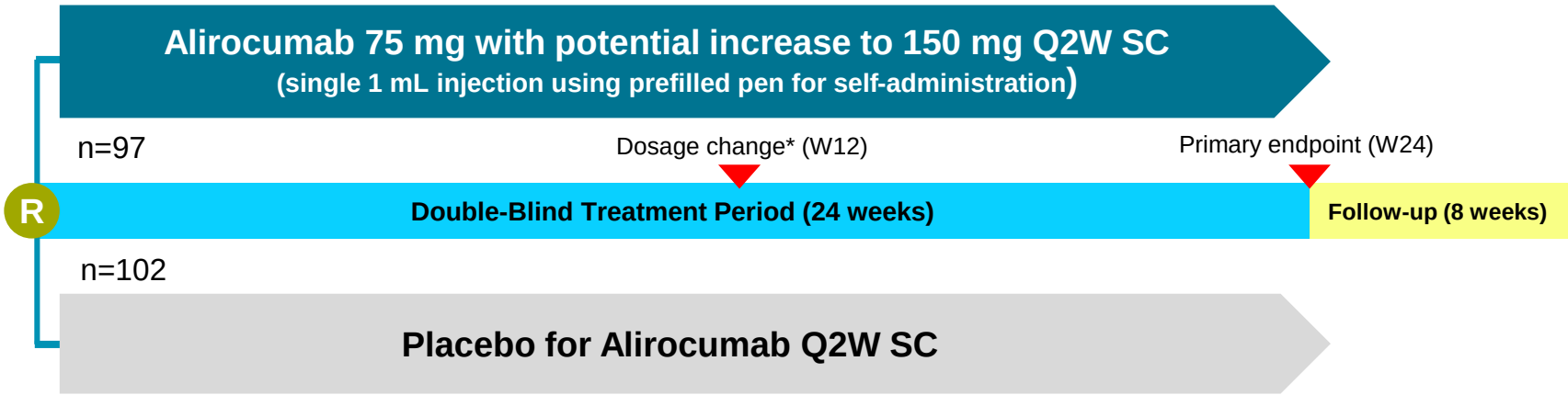
ODYSSEY KT Trial: Koh, Kwang K., et al. *Journal of clinical lipidology*, 2017.

ODYSSEY KT - Study Design

Randomized | **Double-blind** | **Placebo-controlled** | **Parallel-group** | **Multicentre study**

199 patients from 25 sites
- Taiwan (n=116 pts, 12 sites)
- South Korea (n=83 pts, 15 sites)

High CV-risk patients on max tolerated statin ± other LMT
- LDL-C ≥1.81 mmol/L [70 mg/dL] (history of CVD), or
- LDL-C ≥2.59 mmol/L [100 mg/dL] (no history of CVD)

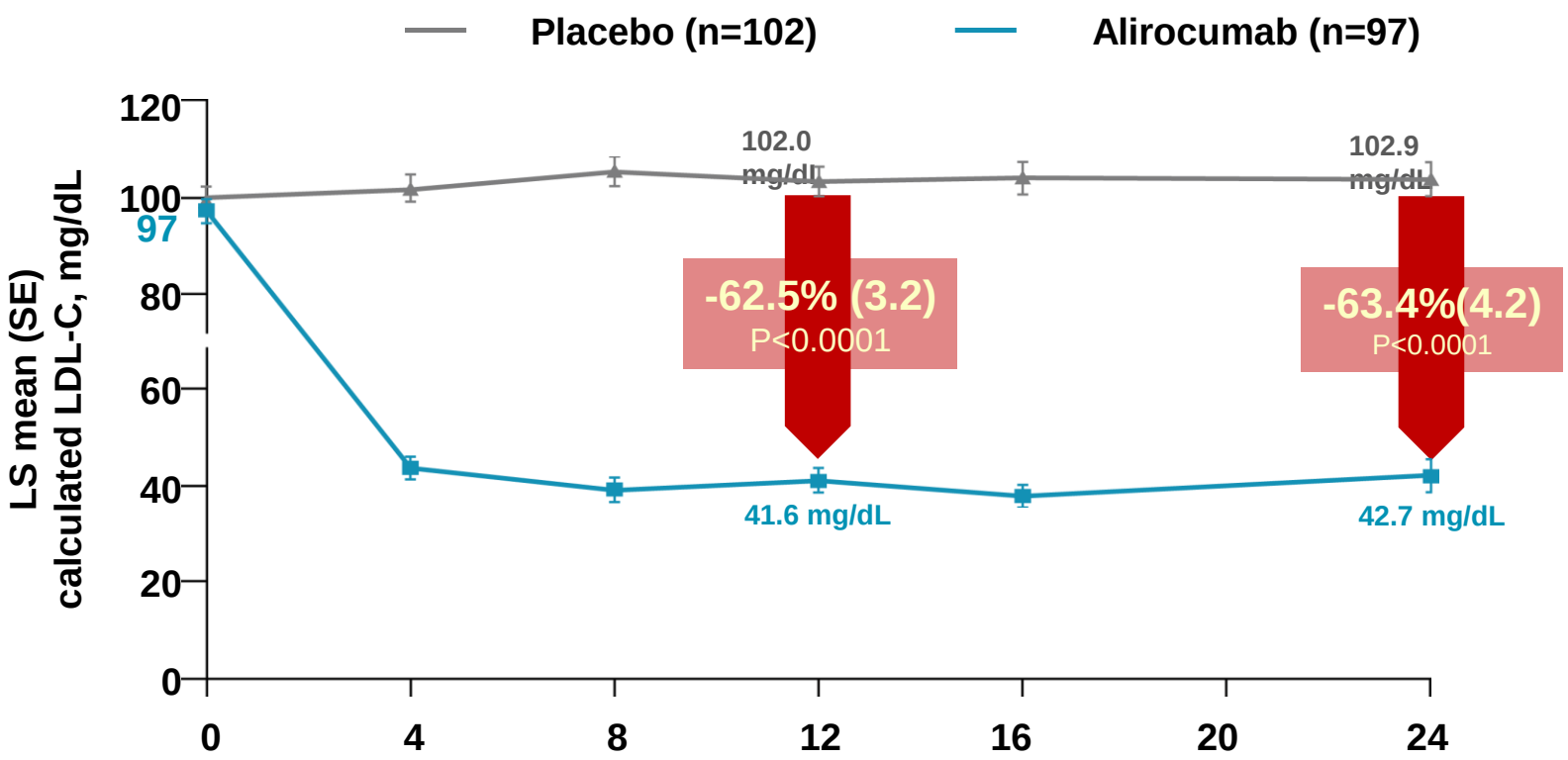


Primary endpoint: % change in calculated LDL-C from baseline to Week 24

*Increase the treatment dosage at W12 if LDL-C ≥ 1.81 mmol/L (70 mg/dL) at W8

ODYSSEY KT Trial: Koh, Kwang K., et al. *Journal of clinical lipidology*, 2017.

ODYSSEY KT - LDL-C Change from Baseline



- Primary endpoint results: at Week 24, alirocumab reduced LDL-C levels by 57.1% (placebo: 6.3% increase)

Note: LS means and SE taken from mixed-effect model with repeated measures analysis. The model includes the fixed categorical effects of treatment group, randomization strata as per IWRS, time point, treatment-by-time point interaction, strata-by-time point
ITT, intent-to-treat; **LS**, least-squares; **SE**, standard error

ODYSSEY KT Trial: Koh, Kwang K., et al. *Journal of clinical lipidology*, 2017.

健保署公告：增訂心臟血管及腎臟藥物PCSK9 血脂調節劑Alirocumab(如Praluent)」之部分規定（自109年1月1日生效）

修訂後給付規定	原給付規定
2.6.4.PCSK9 血脂調節劑 2.6.4.1.Evolocumab (如Repatha)：(107/3/1、108/5/1)(略) 2.6.4.2 Alirocumab(如Praluent) (109/1/1)： 限使用於發生重大心血管事件之病人： 1.須經事前審查核准後使用，每次申請得核准使用 6 個月，再次申請須檢附評估報告，若血中 LDL-C較本藥物開始使用前下降程度未達 30%，即屬療效不佳，則不再給付。 2.限給付於發生重大心血管事件之後一年內且使用最大耐受劑量statin之病人，如心肌梗塞、接受冠狀動脈或其他動脈血管再通術(revascularization)、動脈硬化相關之缺血性腦中風等之動脈粥狀硬化心血管疾病之成人病人，且符合下列條件之一者： (1)經使用高強度statin (如 rosuvastatin 20mg 或atorvastatin 40 mg(含)以上)或病人可耐受之最大劑量的statin三個月(含)以上且之後再合併使用ezetimibe 10 mg 三個月(含)以上，LDL-C 仍高於 135 mg/dL者。 (2)對statin有禁忌症或確診為對statin不耐受之病人，經其他降血脂藥物(至少需有ezetimibe 10 mg)持續治療3個月，LDL-C仍高於 135 mg/dL者。 3.最高劑量為每兩週使用 1 支。 4.不可同時使用其他PCSK9 血脂調節劑。	2.6.4.Evolocumab (如Repatha)：(107/3/1、108/5/1) (略)

備註：劃線部分為新修訂之規定。

使用健保給付 PCSK9 血脂調節劑事前審查申請表

修訂日期：109/4/1

一、申請者資料

申請醫院：_____醫院代碼：_____

填表日期：_____年_____月_____日 填表人員：_____聯絡電話：_____

申請醫師：_____（醫師證書字號_____）

本次申請日期：_____年_____月_____日 首次申請日期：_____年_____月_____日

二、病人資料

姓名：_____ 性別：□男 □女 身分證（護照）字號：_____

出生日期：_____年_____月_____日 保險身分：□健保 □非健保 醫院病歷號碼：_____

聯絡電話：_____、_____、_____

居住地址：(縣市：_____)_____

三、申請使用 PCSK9 血脂調節劑原因

3.1 重大心血管疾病（必要條件）

以下診斷至少需符合一項，首次申請限給付於在發病後一年內開始使用最大耐受劑量 statin 之病人

□心肌梗塞

□動脈硬化相關之缺血性腦中風發作

□接受冠狀動脈或其他動脈血管再通術（Revascularization）

發病日期：_____年_____月_____日

3.2 符合 PCSK9 血脂調節劑原因 以下條件至少需符合一項 （必要條件）

□ **(1) 經使用高強度 statin （如 rosuvastatin 20mg 或 atorvastatin 40 mg（含）以上）或病人可耐受之最大劑量的 statin 三個月（含）以上且之後再合併使用 ezetimibe 10 mg 三個月（含）以上，LDL-C 仍高於 135 mg/dL 之成人病人**

甲、所使用最大耐受劑量之 statin 三個月（含）以上，之後加上 ezetimibe 三個月（含）以上

□ **Rosuvastatin 20 mg** □ **Atorvastatin 40 mg（含）以上**

治療期間：_____年_____月_____日 ~_____年_____月_____日

如未達上述劑量，請詳述最大耐受劑量之 statin 和原因_____

乙、Ezetimibe 治療期間：_____年_____月_____日 ~_____年_____月_____日

□ **(2) 病人有下列 statin 禁忌症且持續使用 Ezetimibe 治療三個月，LDL-C 仍高於 135mg/dL**

□ 藥物過敏，請說明使用之成分名稱、藥品名稱及健保代碼，和所提報之過敏反應及其發病過程佐證資料_____

□ 活動性肝病變，請詳附佐證資料_____

Ezetimibe 治療期間：_____年_____月_____日 ~ _____年_____月_____日

□ **(3) 診斷為對 statin 不耐受之患者，且持續使用 Ezetimibe 治療三個月，LDL-C 仍高於 135mg/dL**

甲、 Statin 之副作用為何？

□確認為嚴重橫紋肌溶解症，只需一種 statin 即可以診斷 statin 不耐受（請詳附佐證資料）

□肌肉或肝臟相關副作用或疾病（需符合中華民國血脂及動脈硬化學會 2019 年之共識規定[1]，Myalgia score for statin intolerance 需大於 8 分，請附相關佐證資料）

□其他_____

乙、 同時是否有確認對“兩種” statin 產生上述副作用（檢附病歷紀錄），其中一種是在最低有效劑量[2]下均有不耐受之情況？ (須註明藥品成分、藥品名稱及健保代碼)

第 1 種 statin_____劑量_____。

第 2 種 statin_____劑量_____。

備註：

1.中華民國血脂及動脈硬化學會 2019 年之共識規定: Chien S-C et al., 2019 Taiwan Society of Lipids and Atherosclerosis expert consensus statement on statin intolerance, Journal of the Formosan Medical Association, https://doi.org/10.1016/j.jfma.2018.11.017

2.每日最低有效劑量之定義依 2019 臺灣 statin intolerance 共識會議為仿單上最低劑量，定義為 rosuvastatin 5 mg, atorvastatin 10 mg, pravastatin 10 mg, lovastatin 20 mg, fluvastatin 20 mg, pitavastatin 1 mg, simvastatin 5 mg。另最低有效劑量可採每週累積之最低劑量計算結果。reference: J Formos Med Assoc. 2018 doi: 10.1016/j.jfma.2018.11.017.

3.3 申請前一年內所有 LDL-C 之報告（首次申請者填寫）

第一次 LDL-C 為_____mg/dL，檢測日期為_____年_____月_____日。

第二次 LDL-C 為_____mg/dL，檢測日期為_____年_____月_____日。

第三次 LDL-C 為_____mg/dL，檢測日期為_____年_____月_____日。

第四次 LDL-C 為_____mg/dL，檢測日期為_____年_____月_____日。

3.4 首次使用 PCSK9 調節劑治療前之 LDL-C 報告及前次治療期間所有 LDL-C 之報告（再次申請者填寫）

首次使用前 LDL-C 為_____mg/dL，檢測日期為_____年_____月_____日。

治療後：第一次 LDL-C 為_____mg/dL，檢測日期為_____年_____月_____日。

第二次 LDL-C 為_____mg/dL，檢測日期為_____年_____月_____日。

四、申請使用 PCSK9 血脂調節劑種類

因上述原因得申請 PCSK9 血脂調節劑治療，最高劑量為每兩週使用 1 支。本類藥品不可同時使用，僅得擇一申請。申請藥物為

■ Repatha® 瑞百安 （Evolocumab），兩週限使用 1 支

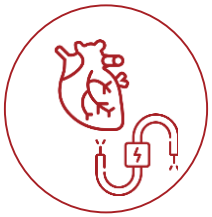
□ Praluent® 保脂通 （Alirocumab），兩週限使用 1 支

Take Home Message

健保降血脂藥物給付規定，針對 **高風險患者** 已放寬規定 (108.2.1)

急性冠狀動脈症候群病史

或



曾接受心導管介入治療

或

外科冠動脈搭橋手術之冠狀動脈粥狀硬化患者

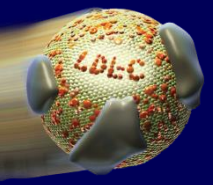
起始藥物治療血脂值：

LDL-C ≥ **70** mg/dL

血脂目標值：

LDL-C < **70** mg/dL

中央健保署網站公告



2017 Taiwan Lipid Guidelines for High Risk Patients: LDL-C treatment algorithm for ACS patients

ACS

Start statin or statin/ezetimibe for all

LDL-C < 70 mg/dL ?

Yes

Keep treatment

DM ?

Yes

LDL-C < 55 mg/dL can be considered

No

Keep treatment

No

Consider patients clinical features

Intolerable

Use high intensity statin ± ezetimibe

Use non high intensity statin ± ezetimibe

LDL-C < 70 mg/dL ?

Yes

Keep treatment

No

Add PCSK9 inhibitor

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Thanks For Your Attention