#### **Presenter Disclosures**

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#### When the art of medicine is in the way of practice of medicine

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# **Problem in need of solution**

- There is a care gap between the actual care (the art) and evidence-based (guidelines recommended) care.
- The observed care gap, as it relates to physicians, may result from relative lack of knowledge or from treatment inertia.
- Solution: empower and support physicians in optimizing their management.



#### Discordance Between Physicians' Estimation of Patient Cardiovascular Risk and Use of Evidence-Based Medical Therapy

Jennifer L.Y. Tsang, MD<sup>a</sup>, Aurora Mendelsohn, PhD<sup>c</sup>, Mary K.K. Tan, BSc<sup>c</sup>, Daniel G. Hackam, MD<sup>d,e,f</sup>, Lawrence A. Leiter, MD<sup>b</sup>, David Fitchett, MD<sup>a,c</sup>, Peter J. Lin, MD<sup>c,g</sup>, Etienne Grima, BSc<sup>c</sup>, Anatoly Langer, MD, MSc<sup>a,c</sup>, and Shaun G. Goodman, MD, MSc<sup>a,c,\*</sup>, for the Vascular Protection Registry and Guidelines Oriented Approach to Lipid Lowering Registry Investigators

Despite clinical trial evidence supporting the use of antiplatelets, angiotensin-converting enzyme inhibitors, and statins for cardiovascular risk reduction in high-risk patients, use of such therapies in real-world outpatients in the prospective Vascular Protection Registry and the Guidelines Oriented Approach to Lipid Lowering Registry was suboptimal (78%, 55%, and 75%, respectively). The most frequent reason physicians cited for nonprescription of statins (33%) was that patients were not high risk enough and/or current guidelines did not support statin use. In conclusion, outpatients at high cardiovascular risk continue to be undertreated as a result of a combination of physician underestimation of cardiovascular risk (knowledge gap) and barriers to implementation of evidence-based therapy (practice gap). © 2008 Elsevier Inc. All rights reserved. (Am J Cardiol 2008;102:1142–1145)





# Performance Matters! Relationship between Process and Outcome

#### **In-hospital Mortality**





## Performance Matters! Changes in Hospital Non-ST ACS Guideline Adherence and Patient Outcomes

#### **Relative Change in Hospital Mortality**



Hospital Quartiles: 1 (N=78) 2 (N=79) 3 (N=79) 4 (N=79) Absolute Change in Guideline Adherence:

(JSA/

-4.6% (worse)+1.8% (better) +6.8% (better) +15.6% (better)

Peterson et al Circulation 2004;110:III-785

#### **RISK ASSESSMENT, STRATIFICATION & TREATMENT CONSIDERATION**

Calculate risk (unless statin-indicated condition) using the <u>Framingham Risk Score (FRS)</u><sup>+</sup> or <u>Cardiovascular Life Expectancy Model (CLEM)</u><sup>+</sup> Repeat screening every 5 years for FRS <5% or every year for FRS ≥5% CANADIAN HEART

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**No Pharmacotherapy** Statin-indicated Conditions **Primary Prevention Conditions** Low Risk **Intermediate Risk High Risk** ·Clinical atherosclerosis LDL-C ≥5mmol/L FRS 10-19% FRS <10% FRS ≥20% Abdominal aortic aneurysm (genetic dyslipidemia) and or Most diabetes including: LDL-C ≥3.5 mmol/L alternative •Age ≥40y or method Age ≥30y & 15y duration Non-HDL-C ≥4.3 mmol/L (type 1 DM) or Microvascular disease ApoB ≥1.2 g/L Chronic kidney disease or Men ≥50 and women ≥60 with one additional risk factor: low HDL-C, impaired fasting glucose, high waist circumference, smoker, hypertension Discuss behavioural modifications **Health Behavioural** Initiate Statin Treatment: Treat to Target Approach Modifications Confirm adherence and barriers to use Smoking cessation LDL-C <2.0 mmol/L or >50% reduction or LDL-C >50% · Diet: apoB <0.8 g/L or non-HDL-C <2.6 mmol/L reduction It is recommended all individuals adopt a health dietary pattern." Target achieved on maximally tolerated dose? YES • Exercise: It is recommended NO NO NO adults should accumulate at least 150 minutes per week Discuss add-on therapy with patient:<sup>¶</sup> of moderate-vigorous **NO ADD-ON** intensity aerobic Evaluate reduction in CVD risk vs. additional cost & side ffects physical activity ADD-ON ADD-ON ADD-ON Monitor **Add-on Therapy**  Response to statin Rx Health behaviours Ezetimibe 1st line Ezetimibe as 1st line (BAS as alternative) Ezetimibe (or BAS) (BAS as alternative) PCSK9 inhibitors as 2nd line or PCSK9 inhibitors (add on to other drugs)\*\*

# GUIDANCE Ezetimibe in LDL-C Care gap

#### Inclusion Criteria: Visit 1: Screening/Baseline (LDL-C > 2.0 mmol/L) 1. High Risk (60% DM) **Optimize Strategy Recommendations:** Calculate LDL-C Target Gap Week 0 2. On stable statin dose already Visit 1: OPTIMIZE i) < 10%: increase statin dose (unless already on atorvastatin 80 mg or rosuvastatin 40 mg, in which 3. LDL not at target case add cholesterol absorption inhibitor (CAI) ii) 10-20%: maximize statin dose if patient is at least Additional visits if necessar 2 dose titrations from the maximum OR initiate combination therapy with statin and CAI Algorithm: iii) > 20%: add CAI 1. Optimize Statin 2. Add CAI (ezetimibe) Visit 2 Week 4-12 $\overline{\text{If LDL}}$ -C > 2.0 mmol/L: Visit 2: FINALIZE 10% 20% 30% 40% 50% **Finalize Strategy Recommendations** Recalculate LDL-C Target Gap 5 mg Rosuvastatin 10 mg 20 mg 40 mg i) < 10%: if on combination therapy already, Atorvastatin 40 mg 80 mg 10 mg 20 mg maximize statin dose OR switch to a high dose of more effective statin. If not on combination Additional visits if necessar therapy, add CAI. Simvastatin 10 mg 20 mg 40 mc ii) > 10%: patient should be on maximal tolerable dose of more effective statin and CAI unless Pravastatin 10 mg 20 mg 40 mg already done, in which case intensify lifestyle interventions further. Lovastatin 20 mg 40 mg 80 mg Visit 3: **Final Observation** Fluvastatin 20 mg 40 mg Week 18-26

Visit 3. END OF STUDY

Katz et al GUIDANCE Can J Cardiol 2011 (27): 138–145

www.chrc.net



#### Ezetimibe was started or continued on top of statin (100%)



### **Physician and Patient Distribution**





### Impact of the implementation science: LDL-C reduction





### **Care Gap: Lipid Modifying Therapy**



	%
Atorvastatin (10/20/40/80 mg)	28 (4/5/8/11)
Rosuvastatin (5/10/20/40 mg)	40 (5/11/12/12)
Pravastatin (10/20/40 mg)	5 (1/1/2)
Simvastatin (5/10/20/40/80 mg)	3 (<1/1/<1/1/<1)
Fluvastatin (20/40 mg)	1 (<1/1)
Lovastatin (20/40 mg)	<1 (<1/<1)
No statin	24
Ezetimibe	26
Bile Acid Sequestrant	5
Fibrate	3
Niacin	<1



### **Additional Lipid Modifying Therapy**

Centre





### % of Patients Achieving LDL-C Target\*



\* ≤2.0 mmol/L by Canadian Cardiovascular Society Guideline Recommendations





#### **Care Gap: Reasons for not prescribing**



			10.30	6.10*10.100%	THE AM I	11.110-3-14-244
	PCSk9 inhibitor			Ezetimibe		
Reasons "why not"	Visit 1 /	Visit 2	Visit 3	Visit 1 /	Visit 2	Visit 3
	Baseline	(N=811)	(N=671)	Baseline	(N=583)	(N=461)
	(N=947)			(N=915)		
Not needed	27.1	20.7	18.9	22.1	20.4	22.1
Patient refused	24.8	41.2	44.1	32.5	40.5	39.9
Will prescribe	18.4	10.9	6.9	14.0	8.4	5.7
next visit						
Cost	26.2	23.9	24.9	9.3	5.8	3.9
Co-morbidities	1.1	0.7	2.2	1.2	1.4	1.5
Patient intolerant	1.5	2.2	3.0	20.5	23.2	26.5
Social constraint	0.6	0.4	0	0.1	0	0.2
Believe management	0.3	0	0	0.3	0.3	0.2
is appropriate						

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#### **CV Medications based on LDL target**



#### achievement

	Overall (N=2009)	LDL-C target not achieved at last available visit (N=1138)	LDL-C target achieved at last available visit (N=871)	р
ACE Inhibitor	38.2%	34.1%	43.5%	<.0001
Angiotensin receptor blockers	22.4%	22.9%	21.8%	0.58
Beta-blocker	39.1%	33.6%	46.4%	<.0001
Calcium Channel Blocker	22.4%	21.1%	24.0%	0.12
Diuretic	19.0%	20.3%	17.2%	0.08
Antiplatelet therapy	61.3%	55.5%	68.8%	<.0001
Anticoagulant therapy	7.2%	7.2%	7.2%	0.98



#### Langer et al, Can J Card Open 2020 (in press)

# Summary: To treat is to be burdened with the care gap (Langer May 2nd, 2020 :) The care gap is universal.

- Most physicians are open minded to addressing the care gap but require support: education, standing orders, reminders, and physician assistants.
- Patient engagement is needed outside of physician visit: public campaigns (the cost of undertreatment and misinformation), sharing of the treatment plan and therapeutic journey.
- Better medications with better compliance: injectables over pills.



# Thank you!

