Ottawa Cardiovascular Centre

USE OF THE LIPID OPTIMIZATION TOOL (LOT) TO ACHIEVE VARIOUS LDL TARGETS IN COMMUNITY PRACTICE

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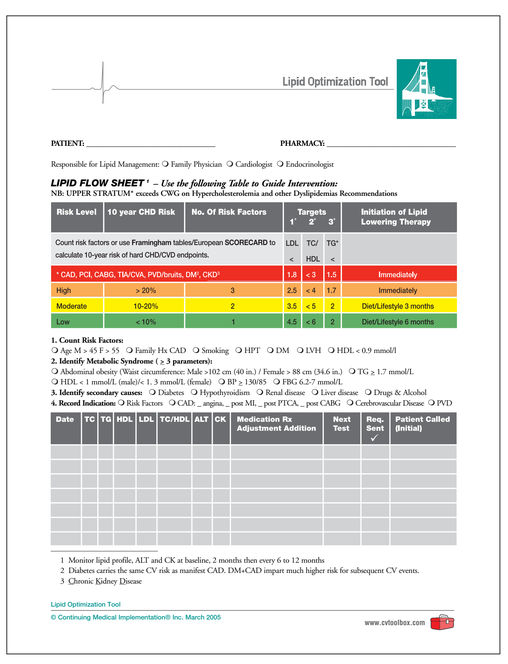
Background (Objectives)

Lipid optimization has the potential to significantly reduce cardiovascular events and CHD death in various at risk populations. Failure to reach LDL target is commonplace and compromises cardiovascular outcomes. Our objective was to audit the effectiveness of the **Lipid Optimization Tool** as available on www.cvtoolbox.com, in achieving dyslipidemia control measured as LDL target achievement, in the high volume community practice at OCC.

Methods

OCC provides comprehensive follow-up to approximately 27,000 cardiovascular patients and structured lipid management and Telemonitoring for approximately 7000 dyslipidemia patients. The LOT has been used to guide lipid management at OCC since 1999. LOT flow sheets for patients of the 9 OCC specialists (6 cardiologists and 3 internists) were sequentially analyzed from July to December 2005. LDL control rates were calculated for the current Canadian Working Group (CWG) targets of 4.5 mmol/L for low risk (LR), 3.5 mmol/L for moderate risk (MR) and 2.5 mmol/L for high risk (HR) patients as well as the anticipated revised CWG LDL HR target of 2.0 mmol/L and the optional very high risk (VHR) NCEP ATP-III LDL target of 1.8 mmol/L.



Lipid Optimization Tool

PATIENT: _____ PHARMACY: _____

Responsible for Lipid Management: ❍ Family Physician ❍ Cardiologist ❍ Endocrinologist

LIPID FLOW SHEET [†] *– Use the following Table to Guide Intervention:*
NB: UPPER STRATUM* exceeds CWG on Hypercholesterolemia and other Dyslipidemias Recommendations

Risk Level	10 year CHD Risk	No. Of Risk Factors	Targets 1˚ LDL <	2˚ TC/ HDL <	3˚ TG* <	Initiation of Lipid Lowering Therapy
Count risk factors or use **Framingham** tables/European **SCORECARD** to calculate 10-year risk of hard CHD/CVD endpoints.						
* CAD, PCI, CABG, TIA/CVA, PVD/bruits, DM[1], CKD[3]			1.8	< 3	1.5	Immediately
High	> 20%	3	2.5	< 4	1.7	Immediately
Moderate	10-20%	2	3.5	< 5	2	Diet/Lifestyle 3 months
Low	< 10%	1	4.5	< 6	2	Diet/Lifestyle 6 months

1. Count Risk Factors:
❍ Age M > 45 F > 55 ❍ Family Hx CAD ❍ Smoking ❍ HPT ❍ DM ❍ LVH ❍ HDL < 0.9 mmol/l
2. Identify Metabolic Syndrome (≥ 3 parameters):
❍ Abdominal obesity (Waist circumference: Male >102 cm (40 in.) / Female > 88 cm (34.6 in.) ❍ TG ≥ 1.7 mmol/L
❍ HDL < 1 mmol/L (male)/< 1. 3 mmol/L (female) ❍ BP ≥ 130/85 ❍ FBG 6.2-7 mmol/L
3. Identify secondary causes: ❍ Diabetes ❍ Hypothyroidism ❍ Renal disease ❍ Liver disease ❍ Drugs & Alcohol
4. Record Indications: ❍ Risk Factors ❍ CAD: _ angina, _ post MI, _ post PTCA, _ post CABG ❍ Cerebrovascular Disease ❍ PVD

Date	TC	TG	HDL	LDL	TC/HDL	ALT	CK	Medication Rx Adjustment Addition	Next Test	Req. Sent ✓	Patient Called (Initial)

1 Monitor lipid profile, ALT and CK at baseline, 2 months then every 6 to 12 months
2 Diabetes carries the same CV risk as manifest CAD. DM+CAD impart much higher risk for subsequent CV events.
3 Chronic Kidney Disease

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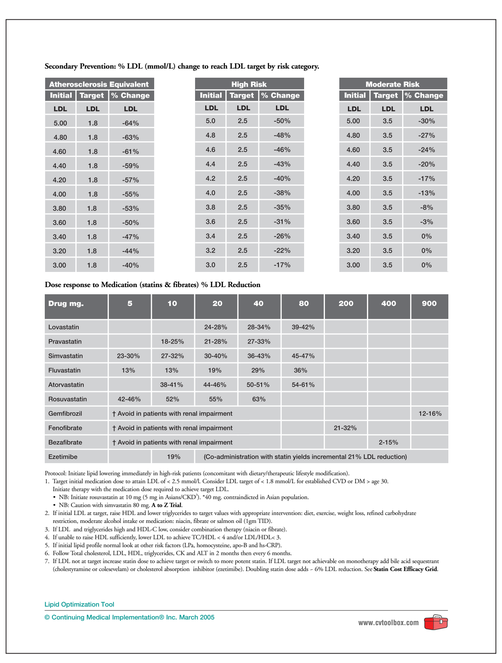

Secondary Prevention: % LDL (mmol/L) change to reach LDL target by risk category.

Atherosclerosis Equivalent			High Risk			Moderate Risk		
Initial	Target	% Change	Initial	Target	% Change	Initial	Target	% Change
LDL	LDL	LDL	LDL	LDL	LDL	LDL	LDL	LDL
5.00	1.8	-64%	5.0	2.5	-50%	5.00	3.5	-30%
4.80	1.8	-63%	4.8	2.5	-48%	4.80	3.5	-27%
4.60	1.8	-61%	4.6	2.5	-46%	4.60	3.5	-24%
4.40	1.8	-59%	4.4	2.5	-43%	4.40	3.5	-20%
4.20	1.8	-57%	4.2	2.5	-40%	4.20	3.5	-17%
4.00	1.8	-55%	4.0	2.5	-38%	4.00	3.5	-13%
3.80	1.8	-53%	3.8	2.5	-35%	3.80	3.5	-8%
3.60	1.8	-50%	3.6	2.5	-31%	3.60	3.5	-3%
3.40	1.8	-47%	3.4	2.5	-26%	3.40	3.5	0%
3.20	1.8	-44%	3.2	2.5	-22%	3.20	3.5	0%
3.00	1.8	-40%	3.0	2.5	-17%	3.00	3.5	0%

Dose response to Medication (statins & fibrates) % LDL Reduction

Drug mg.	5	10	20	40	80	200	400	900
Lovastatin			24-28%	28-34%	39-42%			
Pravastatin		18-25%	21-28%	27-33%				
Simvastatin	23-30%	27-32%	30-40%	36-43%	45-47%			
Fluvastatin	13%	13%	19%	29%	36%			
Atorvastatin		38-41%	44-46%	50-51%	54-61%			
Rosuvastatin	42-46%	52%	55%	63%				
Gemfibrozil	† Avoid in patients with renal impairment							12-16%
Fenofibrate	† Avoid in patients with renal impairment					21-32%		
Bezafibrate	† Avoid in patients with renal impairment						2-15%	
Ezetimibe		19%	(Co-administration with statin yields incremental 21% LDL reduction)					

Protocol: Initiate lipid lowering immediately in high-risk patients (concomitant with dietary/therapeutic lifestyle modification).
1. Target initial medication dose to attain LDL of < 2.5 mmol/l. Consider LDL target of < 1.8 mmol/l, for established CVD or DM > age 50.
   Initiate therapy with the medication dose required to achieve target LDL.
   • NB: Initiate rosuvastatin at 10 mg (5 mg in Asians/CKD!), *40 mg. contraindicated in Asian population.
   • NB: Caution with simvastatin 80 mg, **A to Z Trial.**
2. If initial LDL at target, raise HDL and lower triglycerides to target values with appropriate intervention: diet, exercise, weight loss, refined carbohydrate restriction, moderate alcohol intake or medication: niacin, fibrate or salmon oil (1gm TID).
3. If LDL and triglycerides high and HDL-C low, consider combination therapy (niacin or fibrate).
4. If unable to raise HDL sufficiently, lower LDL to achieve TC/HDL < 4 and/or LDL/HDL< 3.
5. If initial lipid profile normal look at other risk factors (Lp, homocysteine, apo-B and hs-CRP).
6. Follow Total cholesterol, LDL, HDL, triglycerides, CK and ALT in 2 months then every 6 months.
7. If LDL not at target increase statin dose to achieve target or switch to more potent statin. If LDL target not achievable on monotherapy add bile acid sequestrant (cholestyramine or colesevelam) or cholesterol absorption inhibitor (ezetimibe). Doubling statin dose adds ~ 6% LDL reduction. See **Statin Cost Efficacy Grid**.

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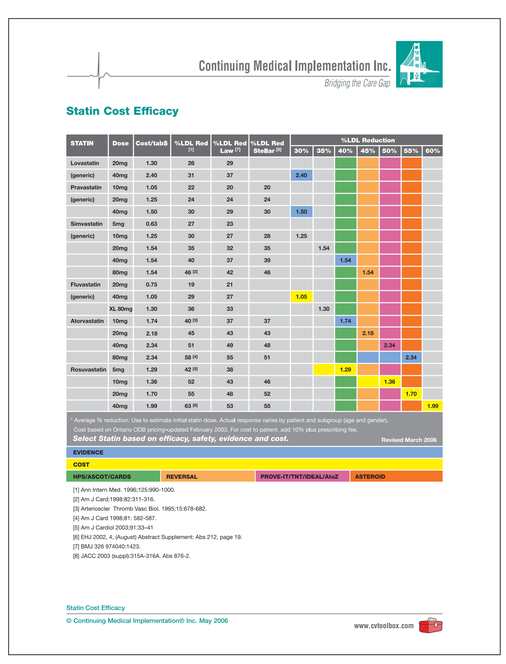

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Bridging the Care Gap

Statin Cost Efficacy

STATIN	Dose	Cost/tab$	%LDL Red [1]	%LDL Red Low [7]	%LDL Red StelBar [8]	%LDL Reduction 30%	35%	40%	45%	50%	55%	60%
Lovastatin	20mg	1.30	26	29								
(generic)	40mg	2.40	31	37		2.40						
Pravastatin	10mg	1.05	22	20	20							
(generic)	20mg	1.25	24	24	24							
	40mg	1.50	30	29	30	1.50						
Simvastatin	5mg	0.63	27	23								
(generic)	10mg	1.25	30	27	28	1.25						
	20mg	1.54	35	32	35		1.54					
	40mg	1.54	40	37	39			1.54				
	80mg	1.54	46 [R]	42	46				1.54			
Fluvastatin	20mg	0.75	19	21								
(generic)	40mg	1.05	29	27		1.05						
	XL 80mg	1.30	36	33			1.30					
Atorvastatin	10mg	1.74	40 [R]	37	37			1.74				
	20mg	2.18	45	43	43				2.18			
	40mg	2.34	51	49	48					2.34		
	80mg	2.34	58 [R]	55	51						2.34	
Rosuvastatin	5mg	1.29	42 [R]	38				1.29				
	10mg	1.36	52	43	46					1.36		
	20mg	1.70	55	48	52						1.70	
	40mg	1.99	63 [R]	53	55							1.99

^ Average % reduction: Use to estimate initial statin dose. Actual response varies by patient and subgroup (age and gender).
Cost based on Ontario ODB prices updated February 2020. For cost to patient, add 10% plus prescribing fee.
Select Statin based on efficacy, safety, evidence and cost. Revised March 2006

EVIDENCE				
COST				
HPS/ASCOT/CARDS	REVERSAL	PROVE-IT/TNT/IDEAL/A to Z	ASTEROID	

[1] Ann Intern Med. 1996;125:990-1000.
[2] Am J Card.1998;82:311-316.
[3] Arterioscler Thromb Vasc Biol. 1995;15:678-682.
[4] Am J Card 1998;81: 582-587.
[5] Am J Cardiol 2003;91:33-41
[6] EHJ 2002, 4, (August) Abstract Supplement: Abs 212, page 19.
[7] BMJ 326 9740;40:1423.
[8] JACC 2003 (supp);315A-316A. Abs 876-2.

Statin Cost Efficacy
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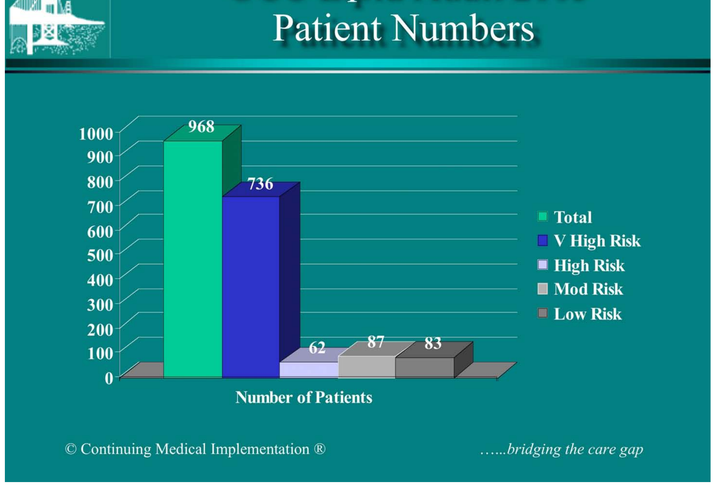
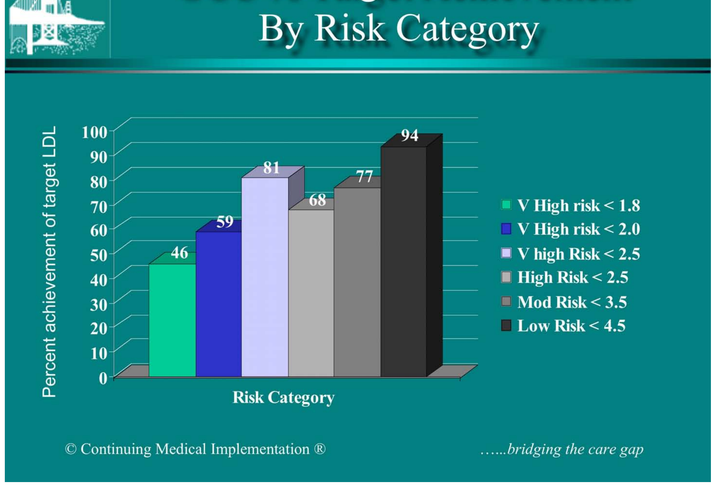
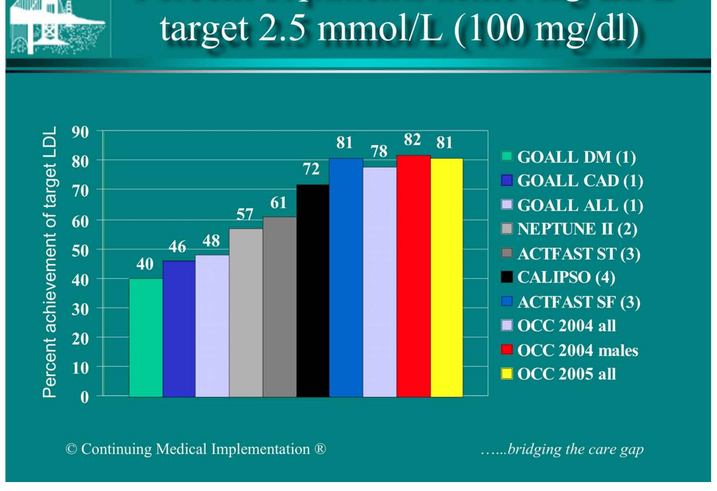
Results

Data was collected on 963 patients; 78 LR, 87 MR, 62 HR and 736 VHR. LDL control rates were LR 94% (target < 4.5 mmol/L), MR 77% (target < 3.5 mmol/L), HR 68% (target < 2.5 mmol/L) and VHR 81% (target < 2.5 mmol/L), 59% (target < 2.0 mmol/L) and 46% (target 1.8 mmol/L).







1) RT Yan et al. Guideline Oriented Approach in Lipid Lowering (GOALL)Rregistry data presented at CCC Symposium Oct 2005.
2) MH Davidson et al. Results of the National Cholesterol Education (NCEP) Program Evaluation Project Utilizing Novel e-Technology (NEPTUNE) II Survey and Implications for Treatment Under the Recent NCEP Writing Group Recommendations. Am J Cardiol 2005 Aug 15;96(4):556-63.
3) A Langer et al. Targeted Dosing of Atorvastatin Achieves Cholesterol Targets Quickly in Subjects with Diabetes or the Metabolic Syndrome (The ACTFAST Studies). Can J Cardiol 2005; Vol 21 Suppl C: Abstract 826, 253C.
4) C Bourgault et al. Stain Therapy in Canadian Patients with Hypercholesterolemia: The Canadian Lipid Study – Observational (CALIPSO). Can J Cardiol 2005; 21(13):1187-1193.

Conclusions

Use of the LOT management protocol in contempory community practice at OCC achieves amongst the best lipid control rates in the world.

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