

LIPID OPTIMIZATION TOOL (LOT) DATABASE TO ACHIEVE LDL **CONTROL IN A COMMUNITY CARDIOLOGY GROUP PRACTICE**

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Purpose: Lipid optimization to newer more aggressive targets has the potential to reduce cardiovascular events significantly. Despite well-established benefits of lipid-lowering therapies, lipid targets are underachieved. At the OCC we have developed a structured physician supervised, nurse managed lipid protocol and applied it via a paper based program. We have audited our practice over the last three years and developed a database capable of ongoing decision support and quality control measurement.

Methods: We have previously reported the use of the LOT to guide LDL control in approximately 7000 patients at the OCC. For our 2006 practice audit, a database version of the LOT was developed. This database is designed to risk stratify, to calculate LDL percent reduction to achieve to CCS, ATP III or user defined targets, to provide therapeutic decision support and to track sequential control rates to specified targets. Reports including risk factors, risk modifiers, coronary heard disease (CHD) equivalents and LDL control rates are generated automatically. Parameters from 1002 sequential patients managed with the LOT by 9 OCC physicians were entered into the database.

Results: Of the 1002 patients audited in 2006, LDL control rates were 92% to an LDL of 3.0 mmol/L, 84% to an LDL of 2.5 mmol/L, 61 % to an LDL of 2.0 mmol/L and 47% to an LDL of 1.8 mmol/L. Eighty % of patients were high or very high risk for cardiovascular events and 87% of these were on a statin. Control rates in statin treated patients were 95% to an LDL of 3.0 mmol/L, 89% to an LDL of 2.5 mmol/L, 66% to an LDL of 2.0 mmol/L and 52% to an LDL of 1.8 mmol/L. Ten percent of patients were on combination therapy with statin + ezetimibe and 5% on combination therapy with statin + fenofibrate. Comparable Vascular Protection (VP)/Guideline Oriented Approach to Lipid Lowering (GOALL) registry control rates were 51%, 22% and 20.8 to LDL's of 2.5, 2.0 and 1.8 mmol/L respectively and Canadian Lipid Study-Observational (CALIPSO) control rates of 64% to an LDL of 2.5 and 19% to an LDL of 1.8 mmol/L.

Conclusion: Although achieved LDL control rates at the OCC utilizing the LOT are among the best reported in the world literature, increased use of combination therapy might result in even better control rates. Further testing of this hypothesis in real time clinical practice using the LOT protocol and database is warranted.



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.

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Lipid Optimization Tool



Lipid Optimization Tool

Patient:

Pharmacy:

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

LIPID FLOW SHEET' - Use the following Table to Guide Intervention: NB*: UPPER STRATUM Exceeds CCS Recommendations for the Dx & Tx of Dyslipidemia and Prevention CVD 2006 / NCEP ATP III Guidelines 2004

Contracting the branching and the branching and the branching and the branching branch											
Risk Level	10 year CHD Risk	No. Of Risk	Targets 1°2°3°			Initiation of Lipid Lowering Therapy					
Count risk facto calculate 10-yea	LDL <	TC/ HDL	TG* <								
* CAD, PCI, CA	* CAD, PCI, CABG, TIA/CVA, PVD/bruits, DM ² , CKD ³						Immediately				
High	> 20%	3	Rx to <	2.0	< 4	1.7	Immediately				
Moderate	10 - 20%	2	Rx if ≥	3.5	< 5	2	Diet/Lifestyle 3 months				
Low	< 10%	≤1	Rx if ≥	5.0	< 6	2	Diet/Lifestyle 6 months				

1) Count Risk Factors:

O Age M > 45 F > 55 O Family Hx CAD O Smoking O HPT O DM O LVH O HDL < 0.9 mmol/l 2) Identify Metabolic Syndrome (> 3 parameters):

O Abdominal obesity (Waist circumference: Male >102 cm (40 in.) / Female > 88 cm (34.6 in.) O TG > 1.7 mmol/L O HDL < 1 mmol/L (male)/< 1. 3 mmol/L (female) O BP > 130/85 O FBG 6.2-7 mmol/L

3) Identify secondary causes: O Diabetes O Hypothyroidism O Renal disease O Liver disease O Drugs & Alcohol



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



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

ATP	III Very H	igh Risk	C	CS High I	Risk
Initial	Target	% Change	Initial	Target	% Change
LDL	LDL <	LDL	LDL	LDL <	Min.↓50%
5.00	1.8	-64%	5.0	2.0	-60%
4.80	1.8	-63%	4.8	2.0	-58%
4.60	1.8	-61%	4.6	2.0	-57%
4.40	1.8	-59%	4.4	2.0	-55%
4.20	1.8	-57%	4.2	2.0	-52%
4.00	1.8	-55%	4.0	2.0	-50%
3.80	1.8	-53%	3.8	1.9	-50%
3.60	1.8	-50%	3.6	1.8	-50%
3.40	1.8	-47%	3.4	1.7	-50%
3.20	1.8	-44%	3.2	1.6	-50%
3.00	1.8	-40%	3.0	1.5	-50%

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	Gemfibrozil † Avoid in patients with renal impairment							12 - 16%
Fenofibrate	† Avoid in pa	tients with rena	al impairment			21-32%		
Bezafibrate	† Avoid in pa	† Avoid in patients with renal impairment					2-15%	
Ezetimibe		19%	(Co-admini	stration with st	atin yie l ds incre	ementa l 21% L	DL reduction)	

Protocol: Initiate lipid lowering immediately in high-risk patients (concomitant with dietary/therapeutic lifestyle modification). 1) Target initial medication dose to ULDL by 40% for Moderate Risk or ULDL by 50% to minimum < 2.0 mmol/L for High Risk. Consider target LDL < 1.8 mmol/L for ATP III Very High Risk patients. Initiate therapy with dose required to achieve target LDL. NB: Initiate rosuvastatin at 10-20 mg (5 mg in Asians/CKD). *40 mg. contraindicted in Asian population.

- NB: Caution with simvastatin 80 mg. A to Z Trial and max dose statin in populations at risk for myositis.
- Ifinitial 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: fibrate, Niaspan® or salmon oil/omega-3 supplements (1am OD-TID).
- If LDL and triglycerides high and HDL-C low, consider combination therapy (fibrate or Niaspan[®]). 4) If unable to raise HDL sufficiently, lower LDL to achieve TC/HDL< 4 and/or LDL/HDL< 3.
- Ifi nitial lipid profile normal look at other risk factors (LPa, homocysteine, apo-B and hs-CRP).
 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 cholesterol absorption inhibitor (ezetimibe) or bile acid sequestrant (cholestyramine or colesevelam). Doubling statin dose adds ~ 6 % LDL reduction. See Statin Cost Efficacy Grid. 8) Feedback results to patent to improve compliance.

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Lipid Optimization Tool

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Statin Cost Efficacy

The Statin Cost Efficacy Grid details the cost and LDL lowering efficacy of all currently available statins. Statins and doses are highlighted based on evidence or cost efficacy. The green column highlights the minimum therapeutic bar for treatment of low and moderate risk patients. The orange column highlights the minimum therapeutic bar to halt atherosclerotic progression. The pink column highlights the minimum therapeutic bar for treatment of high risk patients or patients with atherosclerotic risk equivalents. The bright orange column highlights the minimum therapeutic bar to induce atherosclerotic regression. See the Lipid Optimization Tool for the therapeutic protocol.

STATIN	Dose	Cost/tab\$	%LDL Red	%LDL Red Law ^[7]	%LDL Red Stellar ^[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	0.45	27	23								
(generic)	10mg	0.89	30	27	28	0.89						
	20mg	1.10	35	32	35		1.10					
	40mg	1.10	40	37	39			1.10				
	80mg	1.10	46 [2]	42	46				1.10			
Fluvastatin	20mg	0.75	19	21								
(generic)	40mg	1.05	29	27		1.05						
	XL 80mg	1.30	36	33			1.30					
Atorvastatin	10mg	1.66	40 [3]	37	37			1.66				
	20mg	2.08	45	43	43				2.08			
	40mg	2.24	51	49	48					2.24		
	80mg	2.24	58 [4]	55	51						2.24	
Rosuvastatin	5mg	1.29	42 [5]	38				1.29				
	10mg	1.36	52	43	46				1.36			
	20mg	1.70	55	48	52					1.70		
	40mg	1.99	63 [6]	53	55						1.99	
			pdated Februar icacy, safet				us prescr	ibing fee		vised Fe	bruary :	2007
HPS/ASCOT	CARDS	B	EVERSAL		PROVE-IT/TN	IT/IDEAL	/AtoZ/S	PARCL	ASTE	ROID		
] Ann Intern Med. 195] Am J Card;1998:82: I] Arterioader Thromb I] Am J Card 1998;81:	6;125:990-100 311-316 Vasc Biol. 199	0.	[5] Am J Caro [6] EHJ 2002, [7] BMJ 326 9		Bupplement: Abs 212, p							
Statin Cost E	fficacy											Pag