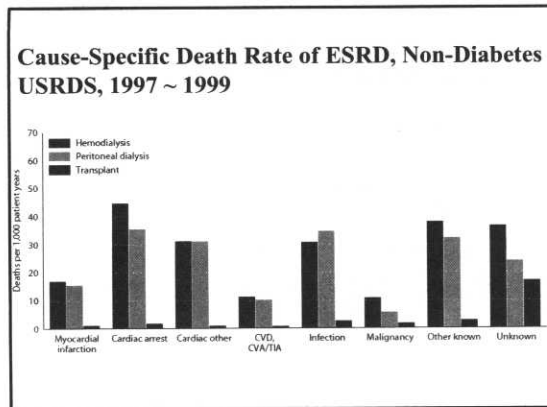
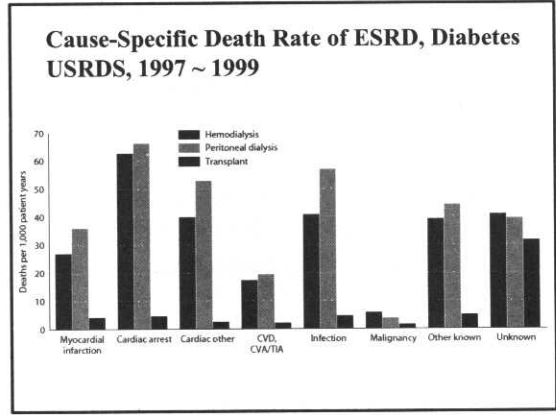
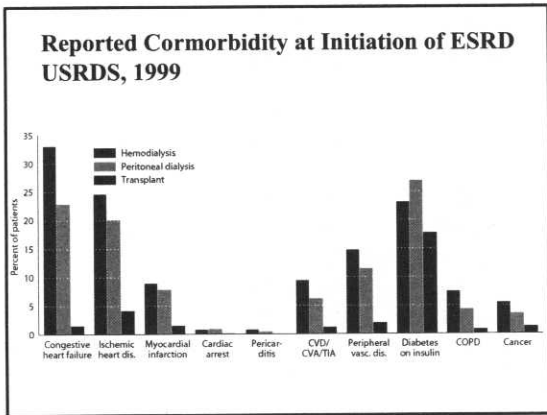


# Management of Lipid in ESRD Patients

성균관대학교 의과대학 내과학교실

김 대 중



**SPECIAL REPORT**

**Controlling the Epidemic of Cardiovascular Disease in Chronic Renal Disease: What Do We Know? What Do We Need to Learn? Where Do We Go From Here?**

Andrew S. Levey, MD, Judith A. Beto, PhD, RD, Borja E. Coronado, MD, Garabed Eknoyan, MD, Robert N. Foley, MSc, MB, Bertram L. Kasiske, MD, Michael J. Klag, MPH, MD, Lionel U. Mailloux, MD, Connie L. Manske, MD, Klemens B. Meyer, MD, Patrick S. Parfrey, MD, Marc A. Pfeffer MD, PhD, Nanette K. Wenger, MD, Peter W.F. Wilson, MD, and Jackson T. Wright, Jr, MD, PhD

***The patients with Chronic Renal Disease Should be Considered in the Highest Risk Group for Subsequent Cardiovascular Disease Events!!!***

- Risk Factors of CV Disease in CRD Patients**
- Hypertension
  - Hyperglycemia
  - Physical inactivity
  - Homocysteine
  - Anemia
  - Hyperlipidemia
  - Tobacco use
  - Menopause
  - Thromobogenic Factors

- Risk Factors of CV Disease in CRD Patients**
- Hypertension
  - Hyperglycemia
  - Physical inactivity
  - Homocysteine
  - Anemia
  - Hyperlipidemia
  - Tobacco use
  - Menopause
  - Thromobogenic Factors

**Prevalence of Hyperlipidemia in CRD Patients**

	TC >240	LDL >130	HDL <35	TG >200	Lp(a) >30
General	20	40	15	15	15
CRI and NS	90	85	50	60	60
CRI without NS	30	10	35	40	45
ESRD-HD	20	30	50	45	30
ESRD-PD	25	45	20	50	50
RTR	60	60	15	35	25

**Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)**

**The Guidelines**

ATP III Executive Summary  
ATP III Full Report

**Related Tools**

- [\\*New! ACC/AHA/ASAP/BSA/CE Clinical Laboratory on Statistics](#)
- [ATP III Risk Calculator: Quick Check \(online version\)](#)
- [ATP III Risk Calculator](#)
- [Exam CSE Interactive Tool](#)
- [20-year Risk Calculator \(online version\)](#)
- [20-year Risk Calculator \(downloadable version\)](#)
- [NCEP/ATP III Conference Webcast](#)

**Information for Patients**

[Lipid Update: Lipid Update Web site \(updated based on ATP III\)](#)  
[High Blood Cholesterol: What You Need to Know](#)  
[20-year Risk Calculator For Patients](#)  
[All Cholesterol Health Information](#)

Community Feedback  
NCEP | AHA | ASAP | BSA | CE | NHLBI

Please send us your feedback, comments, and questions by using the appropriate link on the page, located here: 12-3-02

**Three Categories of Risk that Modify LDL-Cholesterol Goals**

Risk Category	LDL Goal (mg/dL)
CHD and CHD risk equivalents	<100
Multiple (2+) risk factors	<130
Zero to one risk factor	<160

### CHD Risk Equivalents

- Other clinical forms of atherosclerotic disease (peripheral arterial disease, abdominal aortic aneurysm, and symptomatic carotid artery disease)
- Diabetes
- Multiple risk factors that confer a 10-year risk for CHD >20%

### Major Risk Factors (Exclusive of LDL Cholesterol) That Modify LDL Goals

- Cigarette smoking
- Hypertension (BP ≥140/90 mmHg or on antihypertensive medication)
- Low HDL cholesterol (<40 mg/dL)<sup>†</sup>
- Family history of premature CHD
  - CHD in male first degree relative <55 years
  - CHD in female first degree relative <65 years
- Age (men ≥45 years; women ≥55 years)

<sup>†</sup> HDL cholesterol ≥60 mg/dL counts as a "negative" risk factor; its presence removes one risk factor from the total count.

### Three Categories of Risk that Modify LDL-Cholesterol Goals

Risk Category	LDL Goal (mg/dL)
CHD and CHD risk equivalents	<100
Multiple (2+) risk factors	<130
Zero to one risk factor	<160

**NATIONAL CHOLESTEROL EDUCATION PROGRAM**  
Third Report of the Expert Panel on the Diagnosis and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)


**Download our ATP III Cholesterol Management Implementation Tool for Palm OS**

The Palm OS (Operating System) program for application of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) is now available.

This interactive guideline tool will assist the clinician in implementing the ATP III Cholesterol Guidelines at the point of care.

The program also contains usable information from ATP III including:

- ATP III classification of lipid levels.
- ATP III CHD risk assessment.
- Therapeutic Lifestyle Changes (TLC).
- Drug therapy for lipid lowering.
- Information on the metabolic syndrome.
- Issues for special populations.



It is recommended that the clinician be thoroughly familiar with the ATP III Guidelines prior to using this reference tool in patient care. The ATP III Executive Summary is available online.

### LDL Cholesterol Goals and Cutpoints for Therapeutic Lifestyle Changes (TLC) and Drug Therapy in Different Risk Categories

Risk Category	LDL Goal (mg/dL)	LDL Level at Which to Initiate Therapeutic Lifestyle Changes (TLC) (mg/dL)	LDL Level at Which to Consider Drug Therapy (mg/dL)
CHD or CHD Risk Equivalents (10-year risk >20%)	<100	≥100	≥130 (100-129: drug optional)
2+ Risk Factors (10-year risk ≤20%)	<130	≥130	10-year risk 10-20%: ≥130 10-year risk <10%: ≥180
0-1 Risk Factor	<160	≥160	≥190 (160-189: LDL-lowering drug optional)

#### ACC/AHA/NHLBI CLINICAL ADVISORY ON STATINS

#### ACC/AHA/NHLBI Clinical Advisory on the Use and Safety of Statins

##### WRITING COMMITTEE MEMBERS

RICHARD C. PASTERNAK, MD, FACC, FAHA  
 SIDNEY C. SMITH, Jr, MD, FACC, FAHA  
 C. NOEL BAIREY-MERZ, MD, FACC

SCOTT M. GRUNDY, MD, PhD, FAHA  
 JAMES I. CLEEMAN, MD  
 CLAUDE LENFANT, MD, FACC (Hon), FAHA

### Therapeutic Doses of Statins

	Starting	Maximum
Lovastatin	20mg	80mg
Pravastatin	20mg	80mg
Simvastatin	20mg	80mg
Fluvastatin	20mg	80mg
Atorvastatin	10mg	80mg

### Adverse Events due to Statins

- *Transaminase elevation in 0.5 ~ 2.0 %*
- *Trus hepatotoxicity not determined*
- *Progression to liver failure exceedingly rare*
- *Reversal with dose reduction is common*
- *Cholestasis, hepatitis, contraindication of statins*
- *But do not worsen chronic B, C hepatitis*
- *May improve fatty liver*

### Adverse Events due to Statins

#### *Withdrawal of cerivastatin due to fatal rhabdom*

- *Non specific muscle of joint pain without CK ↑*
- *Severe myopathy 0.08 % with simv and lovastatin*
- *If CK > 10 x baseline CK, then D/C statins*
- *With 10 > CK > 3, or myalgia, monitor carefully*

### A placebo-controlled trial examining atorvastatin in dyslipidemic patients undergoing CAPD

KEVIN P.G. HARRIS, DAVID C. WHEELER, CAMILLA C. CHONG, and the ATORVASTATIN IN CAPD STUDY INVESTIGATORS<sup>1</sup>

Department of Nephrology, Leicester General Hospital, Leicester, Centre for Nephrology, Royal Free and University College Medical School, London, and Pfizer Pharmaceuticals Group, Sandwich, Kent, England, United Kingdom

### Safety and Efficacy of Simvastatin in Hypercholesterolemic Patients Undergoing Chronic Renal Dialysis

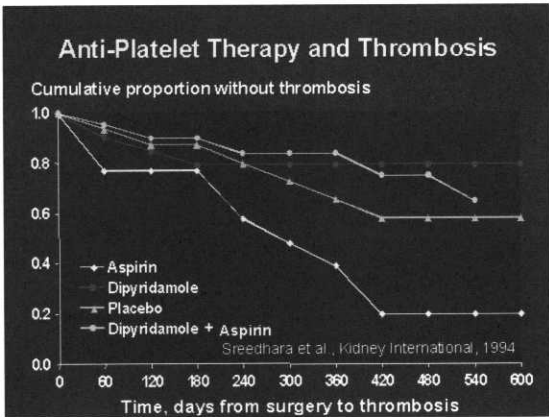
David Saltissi, MBBS, FRCP, MD, Colleen Morgan, RN, Russell J. Rigby, MBBS, FRACP, and Justin Westhuyzen, PhD

### Risk Factors of CV Disease in CRD Patients

- *Hypertension*
- *Hyperlipidemia*
- *Hyperglycemia*
- *Tobacco use*
- *Physical inactivity*
- *Menopause*
- *Homocysteine*
- *Thromobogenic Factors*
- *Anemia*

*The USPSTF found good evidence that aspirin decreases the incidence of coronary heart disease in adults who are at increased risk for heart disease. They also found good evidence that aspirin increases the incidence of gastrointestinal bleeding and fair evidence that aspirin increases the incidence of hemorrhagic strokes. The USPSTF concluded that the balance of benefits and harms is most favorable in patients at high risk of CHD (5-year risk of greater than or equal to 3 percent) but is also influenced by patient preferences*

**Very few study about antiplatelet agents in ESRD patients !!**



### Pharmacologic Trial: PTFE Grafts

Sreedhara et al, *KI* 1994

84 Patients 18 month follow-up

Drug	Dose	Relative Risk	p
Dipyridamole	75 TID	0.35	0.02
ASA	325 QD	1.99	0.18

### Combination aspirin plus clopidogrel in the prevention of hemodialysis access graft thrombosis

- 2001 ASN presentation
- Financial Support by Sanofi
- Aspirin 325 mg + Clopidogrel 75 mg vs. Placebo
- Premature termination due to bleeding risk
- Bleeding 45.2% vs. 28.1% (p = 0.013)
- Major bleeding 7 (/104) vs. 1 (/96) (p=0.067)

*J Am Soc Nephrol* 13: 2331-2337, 2002

### Low-Intensity Warfarin Is Ineffective for the Prevention of PTFE Graft Failure in Patients on Hemodialysis: A Randomized Controlled Trial

MARK A. CROWTHER,\* CATHERINE M. CLASE,\* PETER J. MARGETTS,\* JIM JULIAN,<sup>1</sup> KIM LAMBERT,\* DENISE SNEATH,<sup>2</sup> RYUTA NAGAI,<sup>2</sup> SARAH WILSON,\* and ALISTAIR J. INGRAM\*

\*Department of Medicine and <sup>1</sup>Department of Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, Canada; and <sup>2</sup>Division of Nephrology, Hotel Dieu Hospital, St. Catharines, Ontario, Canada