

# Proprotein Convertase Subtilisin/Kexin Type 9 Inhibitors: an Emerging Chapter in the Field of Clinical Lipidology

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## Abstract

The role of low-density lipoprotein cholesterol (LDL-C) in the pathophysiology of atherosclerosis is well recognized, and statin therapy represents the standard of care for LDL-C lowering and reduction of cardiovascular risk. However, many patients fail to achieve LDL-C goals, while others are intolerant to statins due to side effects. Unfortunately, until recently, the efficacy of other non-statin LDL-C-lowering agents was limited, achieving an LDL-C reduction of no more than 20%. Proprotein Convertase Subtilisin/Kexin Type 9 (PCSK9) Inhibitors represent a new class of LDL-lowering agents, producing large reductions in LDL-C. The present review aims to provide the current clinical and scientific data pertaining to this promising new class of LDL-C-lowering agents.

**Keywords:** Hypercholesterolemia; LDL receptors; Statins; PCSK9 inhibitors

The role of low-density lipoprotein cholesterol (LDL-C) in the pathophysiology of atherosclerosis is well recognized, and statin therapy represents the standard of care for LDL-C lowering and reduction of cardiovascular risk. However, many patients fail to achieve LDL-C goals, while others are intolerant to statins due to side effects. Unfortunately, until recently, the efficacy of other non-statin LDL-C-lowering drugs was limited, achieving an LDL-C reduction of no more than 20%. Thus, extensive research is being carried out to identify new LDL-C-lowering agents with an acceptable side effect profile, which, used alone or in combination with statins, would improve our ability to achieve LDL-C goals and reduce cardiovascular risk [1].

It has been more than a decade since Seidah et al. [2] identified the ninth member of the proprotein convertase family, PCSK9. Proprotein Convertase Subtilisin/Kexin Type 9 is a serine protease, mainly expressed in the liver but also in the intestine and kidneys, located in the human chromosome 1p32.3 that encodes a 692 amino acid inactive glycoprotein [3]. It promotes the degradation of LDL receptors (LDLR) by reducing their recycling and targeting the receptors for lysosomal destruction, thus decreasing the rate of removal of LDL-C from the circulation. This was demonstrated in vitro and in mouse models and inferred by genetic studies in patients with PCSK9 mutations [4-6].

Abifadel, et al. [7] first reported that a specific heterozygous PCSK9 missense mutation caused autosomal dominant hypercholesterolemia. Because loss of a single allele is usually functionally inconsequential, the authors immediately raised the possibility that PCSK9 missense mutations might increase plasma cholesterol levels via a gain-of-function mechanism. This has actually been shown in several clinical and experimental studies [7-10].

Since PCSK9 is a key regulator for LDLR activity, and given the fact that statins upregulate PCSK9 with consequent attenuation of their LDL-C-lowering effect [11], its inhibition seems an attractive target for the treatment of hypercholesterolemia. So far, several therapeutic strategies have been developed in order to reduce circulating PCSK9; however, monoclonal antibodies have emerged as the new class of drugs that very effectively lower LDL-C levels [12].

To date, the humanized monoclonal antibodies designated AMG 145 or Evolocumab, REGN727/SAR236553 or Alirocumab, and RN316 or Bococizumab have mostly been studied in the last few years.

In two studies named Open-Label Study of Long-Term Evaluation against LDL Cholesterol 1 (OSLER-1) and 2 (OSLER-2), a randomized, open-label design was used in a total of 4,465 patients with various degrees of cardiovascular risk. Evolocumab, administered subcutaneously at a dose of 140 mg every 2 weeks or 420 mg monthly, was added to standard therapy and compared with standard therapy alone over a period of approximately 1 year [13].

The results of these two studies, which were analyzed and reported together, showed that after 12 weeks evolocumab, as compared with standard therapy, reduced the LDL cholesterol level by 61% (95% confidence interval [CI], 59 to 63;  $P < 0.001$ ), and this reduction remained consistent over time. Evolocumab raised levels of HDL cholesterol and apolipoprotein A1 by 7.0% and 4.2%, respectively ( $P < 0.001$  for both comparisons) [13].

The adverse events included some non-specific ones, such as arthralgias, headache, limb pain and fatigue, although some neurocognitive adverse events were found to be more frequent in the evolocumab group compared to the standard-therapy group. The rate of cardiovascular events at 1 year was reduced from 2.18% in the standard-therapy group to 0.95% in the evolocumab group (hazard ratio in the evolocumab group, 0.47; 95% confidence interval, 0.28 to 0.78;  $P = 0.003$ ) [13].

Long-Term Safety and Tolerability of Alirocumab in High Cardiovascular Risk Patients with Hypercholesterolemia Not Adequately Controlled with Their Lipid Modifying Therapy (ODYSSEY LONG TERM), was a double-blind, randomized, controlled trial of Alirocumab (150 mg SQ every 2 weeks) versus placebo for 78 weeks in 2,341 patients at high risk for cardiovascular events, who were already receiving the maximum tolerated doses of statins [14].

In the ODYSSEY LONG TERM trial, the PCSK9 inhibitor alirocumab, as compared with placebo, reduced LDL cholesterol levels in high-risk patients by an additional 62% when added to statin therapy at the maximum tolerated dose, with or without other lipid-lowering therapy. The effect was consistent over a period of 78 weeks of therapy. The efficacy of alirocumab was similar across various subgroups, including those defined according to the presence or absence of heterozygous familial hypercholesterolemia. In addition, there was a reduction of 26% versus placebo in the levels of lipoprotein (a) [14].

With respect to specific adverse events, the alirocumab group had higher rates than the placebo group of injection-site reactions (5.9% vs. 4.2%), myalgia (5.4% vs. 2.9%), neurocognitive events (1.2% vs. 0.5%), and ophthalmologic events (2.9% vs. 1.9%). In a post hoc analysis, the rate of major adverse cardiovascular events (death from coronary heart disease, nonfatal myocardial infarction, fatal or nonfatal ischemic stroke, or unstable angina requiring hospitalization) was lower with alirocumab than with placebo (1.7% vs. 3.3%; hazard ratio, 0.52; 95% confidence interval, 0.31 to 0.90; nominal  $P = 0.02$ ) [14].

In another 24 week, multicenter, randomized, double blind, placebo-controlled, parallel group, dose ranging phase 2b study (NCT01592240), bococizumab significantly reduced LDL-C levels across all doses [15]. The primary end point was the absolute change in LDL-C levels from baseline to week 12 after placebo or bococizumab administration. Of the 354 subjects randomized, 351 received treatment (placebo [ $n = 100$ ] or bococizumab [ $n = 251$ ]). The most efficacious bococizumab doses were 150 mg Q14 days and 300 mg Q28 days. Compared with placebo, bococizumab 150 mg Q14 days reduced LDL-C at week 12 by 53.4 mg/dl and bococizumab 300 mg Q28 days reduced LDL-C by 44.9 mg/dl (inclusive of the protocol-directed dose reductions for LDL-C readings  $\leq 25$  mg/dl in 32.5% and 34.2% of subjects at week 10 or 8, respectively) [15].

Adverse events were similar across placebo and bococizumab groups. Few subjects ( $n = 7$ ; 2%) discontinued treatment because of treatment-related adverse events. In conclusion, bococizumab significantly reduced LDL-C across all doses despite dose reductions in approximately 35% of the subjects [15].

Finally, a very recent large meta-analysis, which included 24 RCTs comprising 10,159 patients, showed that treatment with PCSK9 antibodies led to a marked reduction of all-cause mortality (odds ratio [OR], 0.45 [CI, 0.23 to 0.86];  $P = 0.015$ ). There was also a non-significant reduction of cardiovascular mortality, although the rate of myocardial infarction was significantly reduced (OR, 0.49 [CI, 0.26 to 0.93];  $P = 0.030$ ). Serious adverse events did not increase with administration of PCSK9 antibodies [16].

Based on the above initial data, there is presently a cautious enthusiasm with the use of PCSK9 inhibitors. However, further long-term trials are required to definitely establish the beneficial role of these agents in the reduction of cardiovascular risk.

## Reference

1. Kosmas CE, Frishman WH (2014) New and Emerging LDL Cholesterol-Lowering Drugs. *Am J Ther.*
2. Seidah NG, Benjannet S, Wickham L, Marcinkiewicz J, Jasmin SB, et al. (2003) The secretory proprotein convertase neural apoptosis-regulated convertase (NARC-1): liver regeneration and neuronal differentiation. *Proc Natl Acad Sci U S A* 100: 928-933.
3. Seidah NG, Prat A (2012) The biology and therapeutic targeting of the proprotein convertases. *Nat Rev Drug Discov* 11: 367-368.
4. Lambert G, Charlton F, Rye KA, Piper DE (2009) Molecular basis of PCSK9 function. *Atherosclerosis* 203: 1-7.
5. Qian YW, Schmidt RJ, Zhang Y, Chu S, Lin A, et al. (2007) Secreted PCSK9 down regulates low density lipoprotein receptor through receptor-mediated endocytosis. *J Lipid Res* 48: 1488-1498.
6. Weinreich M, Frishman WH (2014) Antihyperlipidemic therapies targeting PCSK9. *Cardiol Rev* 22: 140-146.

7. Abifadel M, Varret M, Rabes JP, Allard D, Ouguerram K, et al. (2003) Mutations in PCSK9 cause autosomal dominant hypercholesterolemia. *Nat Genet* 34: 154-156.
8. Horton JD, Cohen JC, Hobbs HH (2009) PCSK9: a convertase that coordinates LDL catabolism. *J Lipid Res* 50: 172-177.
9. Naoumova RP, Tosi I, Patel D, Neuwirth C, Horswell SD, et al. (2005) Severe hypercholesterolemia in four British families with the D374Y mutation in the PCSK9 gene: long-term follow-up and treatment response. *Arterioscler Thromb Vasc Biol* 25: 2654-2560.
10. Cameron J, Holla ØL, Ranheim T, Kulseth MA, Berge KE, et al. (2006) Effect of mutations in the PCSK9 gene on the cell surface LDL receptors. *Hum Mol Genet* 15: 1551-1558.
11. Dubuc G, Chamberland A, Wassef H, Davignon J, Seidah NG, et al. (2004) Statins upregulate PCSK9, the gene encoding the proprotein convertase neural apoptosis-regulated convertase-1 implicated in familial hypercholesterolemia. *Arterioscler Thromb Vasc Biol* 24: 1454-1459.
12. Stein EA, Raal FJ (2014) New therapies for reducing low-density lipoprotein cholesterol. *Endocrinol Metab Clin North Am* 43: 1007-1033.
13. Sabatine MS, Giugliano RP, Wiviott SD, Raal FJ, Blom DJ, et al. (2015) Efficacy and safety of evolocumab in reducing lipids and cardiovascular events. *N Engl J Med* 372: 1500-1509.
14. Robinson JG, Farnier M, Krempf M, Bergeron J, Luc G, et al. (2015) Efficacy and safety of alirocumab in reducing lipids and cardiovascular events. *N Engl J Med* 372: 1489-1499.
15. Ballantyne CM, Neutel J, Cropp A, Duggan W, Wang EQ, et al. (2015) Results of bococizumab, a monoclonal antibody against proprotein convertase subtilisin/kexin type 9, from a randomized, placebo-controlled, dose-ranging study in statin-treated subjects with hypercholesterolemia. *Am J Cardiol* 115: 1212-1221.
16. Navarese EP, Kolodziejczak M, Schulze V, Gurbel PA, Tantry U, et al. (2015) Effects of Proprotein Convertase Subtilisin/Kexin Type 9 Antibodies in Adults With Hypercholesterolemia: A Systematic Review and Meta-analysis. *Ann Intern Med*.

## Curriculum Vitae



Constantine E. Kosmas, M.D., Ph.D., Facc, Fapc

ASSISTANT CLINICAL PROFESSOR OF MEDICINE (CARDIOLOGY)

DIRECTOR OF LIPID CLINIC, CARDIOLOGY UNLIMITED, P.C.

Diplomate, Certification Board of Nuclear Cardiology

Diplomate, American Board of Clinical Lipidology

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## Education

1977 - 1983

University of Athens Medical School, Athens, Greece.  
 (Premedical education is included in the six-year medical school).  
 Graduated with "Excellent" with an M.D. degree.

1971 - 1977

Experimental High School of the University of Athens, Athens, Greece.  
 This school was established for students who had the potential for academic excellence. Graduated with "Excellent".

## Fellowship

7/1992 - 6/1995  
Episcopal Hospital, Philadelphia, Pennsylvania.  
Fellow in the three-year Cardiology program.

## Residencies

7/1989 - 6/1992  
St. John's Episcopal Hospital, South Shore, Far Rockaway, New York.  
Resident in the three-year Internal Medicine program.

6/1987 - 5/1989  
Alexandra University Hospital, Athens, Greece.  
Resident in the Internal Medicine program.  
(Interrupted in order to commence training in the USA).

8/1984 - 3/1985  
251 General Air Force Hospital, Athens, Greece.  
Intern in Internal Medicine during military service.

## Doctoral Thesis

1992  
Doctorate in Medicine (Ph. D.) granted with "Excellent" by the University of Athens Medical School, Athens, Greece:  
Kosmas CE: Substitution of the left and right ventricles by counter pulsation pumps during ventricular fibrillation. Mechanism of the hemodynamic effect of the right ventricular pump.  
Doctoral Thesis. From the Department of Clinical Therapeutics, University of Athens, Athens, Greece, June 1992.  
[62 pages, 113 references. In Greek with English summary].

## Other Experience

5/1986 - 1/1987  
"Health Mansions" Clinic, Athens, Greece.  
Internal assistant in Medicine, temporarily before starting residency.

5/1985 - 5/1986  
Agrarian Clinic of Mavrikion, Mavrikion, Ahaia, Greece.  
One-year mandatory general medical practice in rural Greece.

## Military Service

10/1983 - 5/1985  
Military service in the Greek Air Force.  
Practiced medicine for most of period of military service.

## Employment History

9/2014 – Present  
Cardiology Unlimited, P.C.  
5030 Broadway, Suite 649  
New York, NY 10034

3/2011 – 8/2014  
Mount Sinai Medical Center  
One Gustave L. Levy Place  
New York, NY 10029

7/2000 – 1/2011  
Cardiovascular Associates of New York  
44-01 Francis Lewis Boulevard  
Bayside, NY 11361

7/1995 - 6/2000  
Vidya S. Banka, M.D. & Assoc., P.C.  
Garfield Duncan Building, Suite 2B  
301 S. 8th Street  
Philadelphia, PA 19106

## Faculty Appointments

|        |  |
|--------|--|
| 3/2011 | Assistant Professor of Medicine (Cardiology)<br>Department of Medicine, Division of Cardiology<br>Mount Sinai School of Medicine<br>New York, New York.              |
| 1/2001 | Clinical Assistant Professor of Medicine (Cardiology)<br>Weill Medical College of Cornell University,<br>New York, New York.   |
| 7/1999 | Clinical Assistant Professor of Medicine (Cardiology)<br>Department of Medicine,<br>Medical School of the University of Pennsylvania,<br>Philadelphia, Pennsylvania. |
| 7/1997 | Clinical Associate<br>Department of Medicine,<br>Medical School of the University of Pennsylvania,<br>Philadelphia, Pennsylvania.                                    |

## Hospital Appointments

|                  |  |
|------------------|--|
| 5/2011 - Present | Cardiology Attending<br>Mount Sinai Hospital of Queens, Astoria, New York.   |
| 3/2011 - Present | Cardiology Attending<br>Mount Sinai Hospital, New York, New York.  |
| 5/2010 – 1/2011  | Cardiology Attending<br>North Shore University Hospital, Manhasset, New York.  |
| 7/2008 – 1/2011  | Cardiology Attending<br>Lenox Hill Hospital, New York, New York.<br><br><ul style="list-style-type: none"><li>• Direct patient care and clinical supervision of the Cardiology fellows, medical residents and Physician Assistants.</li></ul>  |
| 7/2000 – 1/2011  | Cardiology Attending<br>New York Hospital Queens, Flushing, New York.<br><br><ul style="list-style-type: none"><li>• Direct patient care and clinical supervision of the Cardiology fellows (7/2004-6/2008), medical residents and medical students.</li><li>• Teaching of the Cardiology fellows (7/2004-6/2008), medical residents (7/2000-6/2008), as well as medical students from Weill Medical College of Cornell University (7/2000-6/2008), during work rounds and at bedside in the Coronary Care Unit and Cardiology wards, as well as with numerous teaching sessions and lectures on a daily basis.</li><li>• Interpretation of approximately 1000 electrocardiograms per year, including exercise electrocardiograms and Holter recordings (7/2000-6/2008).</li><li>• Interpretation of approximately 1000 cardiac nuclear studies per year.<br/>[Cardiovascular Associates of New York, P.C.: First Floor, Nuclear Stress Room, 44-01 Francis Lewis Blvd., Bayside, New York 11361 and Cardiovascular Associates of New York, P.C.: 23-18 31 Street, Astoria, New York 11105 (2003-2011)-Radiation Safety Officer for this facility].</li><li>• Performance of approximately 50 cardiac catheterizations per year (2000-2001).</li></ul> |

## Hospital Appointments (Cont.)

1/2002 – 6/2003

Acting Director, Coronary Care Unit  
New York Hospital Queens, Flushing, New York.

- Clinical and administrative supervisory responsibilities for the development and optimization of clinical curricula for the comprehensive training and teaching of the medical residents in the Coronary Care Unit.
- Clinical and administrative supervisory responsibilities for the development and optimization of clinical protocols for optimal, evidence-based management of the patients admitted to the Coronary Care Unit.
- Clinical and administrative supervisory responsibilities for the optimal operation of the Coronary Care Unit.

7/1996 – 6/2000

**Cardiology Attending**  
Pennsylvania Hospital, Philadelphia, Pennsylvania.

- Direct patient care and clinical supervision of the medical residents and medical students.
- Teaching of the medical residents, as well as medical students from Thomas Jefferson University and University of Pennsylvania, during work rounds and at bedside in the Coronary Care Unit and Cardiology wards, as well as with numerous teaching sessions and lectures on a daily basis.
- Interpretation of approximately 3000 electrocardiograms per year (including exercise electrocardiograms and Holter recordings).
- Interpretation of approximately 300 echocardiographic studies per year.
- Performance of approximately 150 cardiac catheterizations per year (including intra-aortic balloon pump insertions).

## Hospital Appointments (Cont.)

8/1995 - 6/2000

**Cardiology Attending**  
Episcopal Hospital, Philadelphia, Pennsylvania.

- Direct patient care and clinical supervision of the Cardiology fellows, medical residents and medical students.
- Training of the Cardiology fellows in the Cardiac Catheterization Laboratories, Echocardiography Laboratory and the Nuclear Cardiology Laboratory on a daily basis.
- Teaching of the Cardiology fellows, medical residents, as well as medical students from Medical College of Pennsylvania, Thomas Jefferson University and Temple University, during work rounds and at bedside in the Coronary Care Unit and Cardiology wards, as well as in the Cardiology Clinic and with numerous teaching sessions and lectures on a daily basis.
- Interpretation of approximately 5000 electrocardiograms per year (including exercise electrocardiograms and Holter recordings).
- Interpretation of approximately 1000 echocardiographic studies per year.
- Interpretation of approximately 2000 cardiac nuclear studies per year.
- Performance of approximately 200 cardiac catheterizations per year (including pulmonary angiograms and intra-aortic balloon pump insertions).

8/1995 - 9/1999

**Director, Clinical Services**

Episcopal Hospital, Philadelphia, Pennsylvania.

- Clinical and administrative supervisory responsibilities for the development and optimization of clinical curricula for the comprehensive training and teaching of the Cardiology fellows.
- Clinical and administrative supervisory responsibilities for the optimal operation of the Cardiology Clinics.

8/1995 - 9/1999

**Associate Director, Nuclear Cardiology**

Episcopal Hospital, Philadelphia, Pennsylvania.

- Clinical and administrative supervisory responsibilities for the comprehensive training and teaching of the Cardiology fellows in the field of Nuclear Cardiology.
- Clinical and administrative supervisory responsibilities for the optimal operation of the Nuclear Cardiology Laboratory.

### Hospital Committees

1/2002 – 6/2008

**Pharmacy and Therapeutics Committee**

New York Hospital Queens, Flushing, New York.

1/2002 – 6/2003

**Critical Care Committee**

New York Hospital Queens, Flushing, New York.

### Practice Appointments

9/2014 – Present

**Director of Lipid Clinic, Cardiology Unlimited, P.C.**

629 West 185th Street, 2nd Floor  
New York, NY 10033

3/2011 – 8/2014

**Medical Director, Mount Sinai Advanced Cardiovascular Group**

30-74 31st Street, 5th Floor  
Astoria, NY 11102

### Teaching Assignments

3/2011 – 8/2014

Cardiology Teaching Attending in 7 Center Cardiac Telemetry Floor  
Mount Sinai Hospital, New York, New York.

Discussing with medical residents and medical students the presentation and clinical course of patients admitted to the Cardiac Telemetry Floor and making decisions regarding their clinical management.

3/2011 – 8/2014

Cardiology Teaching Attending in Coronary Care Unit  
Mount Sinai Hospital, New York, New York.

Discussing with Cardiology fellows and medical residents the presentation, clinical course and management of patients admitted to the Coronary Care Unit.

7/2000 – 6/2008  
Cardiology Teaching Attending in Coronary Care Unit  
New York Hospital Queens, Flushing, New York.  
  
Discussing with Cardiology fellows (7/2004-6/2008) and medical residents the presentation, clinical course and management of patients admitted to the Coronary Care Unit.

7/2000 – 6/2008  
Cardiology Teaching Attending in 2N Cardiac Telemetry Floor  
New York Hospital Queens, Flushing, New York.  
  
Discussing with Cardiology fellows (7/2004-6/2008) and medical residents the presentation and clinical course of patients admitted to the Cardiac Telemetry Floor and making decisions regarding their clinical management.

#### Teaching Assignments (Cont.)

7/2000 – 6/2008  
Cardiology Teaching Attending - BMA Consult Services  
New York Hospital Queens, Flushing, New York.  
  
Discussing a large spectrum of cardiac clinical didactic cases with Cardiology fellows (7/2004-6/2008) and medical residents and teaching them how to perform a comprehensive cardiac consultation.

11/2000  
Preceptor of Third-Year Clerkship in Internal Medicine for medical students from Weill Medical College of Cornell University  
New York Hospital Queens, Flushing, New York.  
  
Discussing clinical cases and teaching third-year medical students how to obtain a comprehensive history, perform a thorough physical exam, optimally assess the pertinent laboratory data and make an appropriate differential diagnosis.

7/1996 - 6/2000  
Cardiology Teaching Attending in Coronary Care Unit  
Pennsylvania Hospital, Philadelphia, Pennsylvania.  
  
Discussing with medical residents, as well as medical students from Thomas Jefferson University and the University of Pennsylvania, the presentation, clinical course and management of patients admitted to the Coronary Care Unit.

7/1996 - 6/2000  
Cardiology Teaching Attending - Consult and Emergency Room Service  
Pennsylvania Hospital, Philadelphia, Pennsylvania.  
  
Discussing a large spectrum of cardiac clinical didactic cases, including the immediate management of patients in the Emergency Room, with medical residents, as well as medical students from Thomas Jefferson University and the University of Pennsylvania, and teaching them how to perform a comprehensive cardiac consultation.



8/1994 - 7/1996 Teaching Attending in Internal Medicine  
Episcopal Hospital, Philadelphia, Pennsylvania.

Discussing with medical residents, as well as medical students from the Medical College of Pennsylvania, the presentation and clinical course of patients admitted to the General Medical Floors and making decisions regarding their clinical management.

8/1994 - 6/1995 Clinical Instructor in Cardiac Diagnostics  
Episcopal Hospital, School of Perfusion Science, Philadelphia, Pennsylvania.

Giving series of lectures within the Cardiac Diagnostic curricula to students from Episcopal Hospital School of Perfusion Science. The topics of the lectures were: "Coronary Artery Disease", "Cardiac Arrhythmias and Pacing" and "Cardiomyopathies".

### Consulting Positions

Scientific Advisor at the General Hospital of Piraeus "Hippocrates", Piraeus, Greece.

### Specialty Certifications

2007 Board Certification in Clinical Lipidology in the United States of America.

2002 Board Certification in Nuclear Cardiology in the United States of America.  
Recertified for the period 2013-2023.

1996 Board Certification in Cardiovascular Disease in Greece.

1995 Board Certification in Cardiovascular Disease in the United States of America.  
Recertified for the period 2005-2015 and for the period 2015-2025.

1993 Board Certification in Internal Medicine in Greece.

1992 Board Certification in Internal Medicine in the United States of America.

### Medical Licenses

1999 Fully registered with the General Medical Council in the United Kingdom as a specialist in General (Internal) Medicine and Cardiology.  
(Registration #: 4609355)

1995 Licensed to practice Medicine and Surgery in the State of New York.  
(License #: 198677)

1992 Licensed to practice Medicine in the Commonwealth of Pennsylvania.  
(License #: MD-046784-L)

1983 Licensed to practice Medicine in Athens, Greece.

### Other Licenses and Certifications:

2001 Certification for successful completion of the TIKOSYN Education Program by the TIKOSYN Program Administration. This certification qualifies the recipient physician to prescribe the anti-arrhythmic drug TIKOSYN™ (dofetilide).

2001 Radioactive Materials License by the City of New York, Department of Health, Bureau of Radiological Health authorizing the use of radioactive material for cardiovascular studies.  
(License #: 91-3134-01)

|      |   |
|------|---|
| 2000 | Certification for successful completion of the course “Clinical Applications in Nuclear Medicine”, including training in the Nuclear Medicine software packages e.soft and Basic ICON, by Siemens Medical Systems, Inc. (Reference #: ILZ0191001)       |
| 2000 | Certification for successful completion of an approved course in Infection Control by the New York State Department of Health and the New York State Education Department.  |
| 1995 | Materials License by the U. S. Nuclear Regulatory Commission authorizing the use of radioactive material for cardiovascular clinical procedures. (License #: 37-03420-01)   |
| 1995 | Radioactive Material License by the Commonwealth of Pennsylvania, Department of Environmental Protection, Bureau of Radiation Protection authorizing the use of radioactive material for cardiovascular studies. (License #: PA-0123)                   |
| 1995 | Certification for successful completion of the 200-hour Physician Training Program in Basic Radioisotope Handling conducted in accordance with the requirements of the U. S. Nuclear Regulatory Commission (10 CFR 35) by Health Physics Services, Inc. |

#### Pharmaceutical Speaker Bureaus and Advisory Panels

|                |  |
|----------------|--|
| 2015 - Present | Member of the Dyslipidemia Speaker Bureau and the Heart Failure Speaker Bureau of Amgen, Inc.  |
| 2015 - Present | Consultant of Sanofi US  |
| 2009 - 2010    | Member of the Speaker Bureau of Lilly USA, LLC   |
| 2008 - 2011    | Member of the Speaker Bureau of GlaxoSmithKline  |
| 2007           | Member of the Speaker Bureau of King Pharmaceuticals, Inc.   |
| 2006 - 2011    | Member of the Speaker Bureau of Abbott Laboratories  |
| 2006 - 2008    | Member of the Speaker Bureau of Novartis Pharmaceuticals Corporation   |
| 2005 - 2011    | Member of the Speaker Bureau of BoehringerIngelheim Pharmaceuticals, Inc.  |
| 2004 - 2011    | Member of the Speaker Bureau of Forest Pharmaceuticals, Inc.   |
| 2004           | Member of the Speaker Bureau of Millennium Pharmaceuticals, Inc.   |
| 2004 - 2011    | Member of the Speaker Bureau of Daiichi Sankyo, Inc.   |
| 2003 - 2008    | Member of the Lecture Bureau of AstraZeneca LP   |
| 2001 - 2002    | Member of the Speaker Bureau of Merck & Co., Inc.  |
| 1996 - 2009    | Member of the Speaker Bureau of Pfizer, Inc.   |
| 10/5/2007      | Cardiology Consultant in the Abbott Laboratories Cardiology Advisory Board Meetingentitled: “Addressing Triglycerides and HDL-C Beyond Statin Monotherapy to Reduce CVD Risk” [New York] |
| 6/12/2003      | Member of the GlaxoSmithKline Carvedilol Regional Post-MI Advisory Panel, establishing the role of Carvedilol in high-risk patients with LVD [New York]                                  |
| 11/28/2000     | Member of the Unimed Pharmaceuticals, Inc. Consultant Advisory Panel to discuss matters relating to Unimed’s drug Teveten® (Eprosartanmesylate) [New York]                               |

5/28/1997 Member of the SmithKline Beecham Pharmaceuticals Regional Advisory Board to discuss pertinent issues relating to SmithKline Beecham's drug Coreg® (Carvedilol) [Pennsylvania]

### Honors and Awards

2001 - 2004 Physician's Recognition Award from the American Medical Association for fulfilling the requirements for this award in Continuing Medical Education.

2001 Certificate of Appreciation from the New York Hospital Queens in recognition of the recipient's efforts in support of the Outreach Programs presented to the community by New York Hospital Queens.

1998 - 2001 Award of Excellence from the Pennsylvania Medical Society for completion of 150 hours of Continuing Medical Education within the last three years that fulfills the highest standards of continuing education set by the members of the Society.

1995 - 1998 Physician's Recognition Award from the American Medical Association for fulfilling the requirements for this award in Continuing Medical Education.

1980 - 1983 Monetary scholarship from the Papadakis Foundation, having passed nationwide examinations for university students with the highest score.

1978 - 1983 Annual honorary scholarships during medical school from the Institute of Government Scholarships.

### Professional Society Memberships

**Fellow of the American College of Physicians-American Society of Internal Medicine**

**Fellow of the American College of Cardiology**

Member of the National Lipid Association

Member of the American Society of Nuclear Cardiology

Member of the American Medical Association

Member of the Athens Medical Association (Greece)

### Lectures-Presentations

#### **Chest Pain in the Hospital**

**American College of Physicians Internal Medicine 2014 Conference**

Orange County Convention Center, Orlando, Florida (4/11/2014).

#### **New Lipid Lowering Drugs on the Horizon**

Lecture given as part of a Scientific Symposium entitled "*Hot Topics in Cardiology: ACC Highlights for the Interventional, Invasive, and General Cardiologist*" – *Session II: "Focus on Prevention"*.

**Transcatheter Cardiovascular Therapeutics Conference-2013 (TCT 2013)**

The Moscone Center, San Francisco, California (10/27/2013).

#### **HDL Functionality: An Emerging Concept in Clinical Lipidology**

Cardiology Grand Rounds

Westchester Medical Center, Valhalla, New York (10/15/2013).

Friday AM Emory University Cardiology Conference

Emory University Hospital, Atlanta, Georgia (11/16/2012).

Cardiology Fellows' Conference

Mount Sinai Medical Center, New York, New York (10/3/2012).

### **Omega-3 Fatty Acids in Cardiovascular Disease**

Grand Rounds  
St. Francis Hospital, Roslyn, New York (12/19/2012).

### **Lipid Regulating Drug Pharmacology and New Frontiers in the Management of Lipid Disorders**

Grand Rounds  
Mount Sinai Hospital of Queens, Astoria, New York (12/12/2011).

Lecture given as part of a Medical Program entitled “*Hippocrates’ Seminars - The Future of Medicine: New Paradigms in Patient Care*” and sponsored by the Hellenic Medical Society of Philadelphia in conjunction with the Hellenic Medical Society of New York.  
Atlantic City, New Jersey (4/2/2011).

### **Current Trends in Management of Lipid Disorders**

Lecture given as part of a Medical Program entitled “*New Frontiers in the Treatment of Cardiovascular Disorders*” and sponsored by an Educational Grant from Biotronik, Inc.  
Astoria, New York (11/15/2011).

### **Lectures-Presentations (Cont.):**

#### **Hypertrophic Cardiomyopathy: From Epidemiology to Electrophysiology**

Medical Program sponsored by an Educational Grant from Boston Scientific Corporation.  
Astoria, New York (3/17/2010).

### **Lipid Regulating Drug Pharmacology and Current Trends in the Management of Lipid Disorders**

Grand Rounds  
St. Barnabas Hospital, Bronx, New York (2/4/2010).

### **Long QT Syndrome – Case Presentation**

Lecture given as part of a Medical Program entitled “Current Topics in Sudden Cardiac Arrest” and sponsored by an Educational Grant from Medtronic, Inc.  
Astoria, New York (11/10/2009).

### **Statin Pharmacology and Current Trends in Management of Lipid Disorders**

Lecture given as part of a Medical Program entitled “From Preventive Cardiology to Cardiovascular Surgery: Current Trends in Management and New Perspectives” and sponsored by an Educational Grant from Medtronic, Inc. and by an Educational Grant from Terumo Cardiovascular Systems Corporation.  
Astoria, New York (2/24/2009).

### **Hypertrophic Cardiomyopathy and Long QT Syndrome**

Lecture given as part of a Medical Program entitled “Beyond Coronary Artery Disease: Inherited Causes of Sudden Cardiac Death” and sponsored by the Sudden Cardiac Arrest Association and by an Educational Grant from St. Jude Medical, Inc.  
Astoria, New York (1/14/2009).

### **Lipid Regulating Drug Pharmacology and Current Concepts in the Management of Lipid Disorders**

Cardiology Conference at the Cardiac Arrhythmia Center  
New York Hospital Queens, Flushing, New York (3/31/2008).

Medicine/Cardiology Conference  
New York Hospital Queens, Flushing, New York (3/12/2008).

### **Lipid Regulating Drug Pharmacology**

Cardiology Core Lecture Series  
New York Hospital Queens, Flushing, New York (10/11/2007).

## Lectures-Presentations (Cont.):

An Update on the Prevention of Sudden Cardiac Death

Medical Program sponsored by an Educational Grant from St. Jude Medical, Inc.  
Astoria, New York (11/1/2006).

### **The Evaluation and Immediate Management of Chest Pain/Acute Myocardial Infarction**

2005 Summer Noontime Lecture Series  
Department of Medicine  
New YorkHospital Queens, Flushing, New York (7/15/2005).

### **Unstable Coronary Syndrome and Acute Myocardial Infarction**

Comprehensive Review of Internal Medicine 2002-2003  
New YorkHospital Queens, Flushing, New York (10/11/2002).

Comprehensive Review of Internal Medicine 2001-2002  
New YorkHospital Queens, Flushing, New York (10/12/2001).

### **Acute Myocardial Infarction**

2002 Summer Noontime Lecture Series  
Department of Medicine  
New YorkHospital Queens, Flushing, New York (7/22/2002).

### **Evidence-based management of hyperlipidemia**

Grand Rounds  
Family Practice Residency Program  
St. John's Episcopal Hospital, South Shore, Far Rockaway, New York (11/6/2001).

### **Management of Heart Failure**

Comprehensive Review of Internal Medicine 2000-2001  
New YorkHospital Queens, Flushing, New York (10/30/2000).

### **Beta-blockade in the management of heart failure**

Cardiology Conference  
PennsylvaniaHospital, Philadelphia, Pennsylvania (2/9/2000).

### **New frontiers in the management of heart failure**

Cardiology Conference  
PennsylvaniaHospital, Philadelphia, Pennsylvania (4/14/1999).

### **Mitral valve prolapse and ventricular arrhythmias**

Cardiology Conference  
PennsylvaniaHospital, Philadelphia, Pennsylvania (3/11/1998).

## Lectures-Presentations(Cont.)

### **Medical advances in the treatment of congestive heart failure: Progress through clinical trials**

Grand Rounds  
St. Joseph's Hospital/NPHS, Philadelphia, Pennsylvania (5/22/1997).

Cardiology Conference  
PennsylvaniaHospital, Philadelphia, Pennsylvania (1/22/1997).

T  
Monthly In-Service Meeting  
CAMcare Health Corporation-Camcare Central, Camden, New Jersey (7/8/1996).

**Nuclear Cardiology Case Presentation: Normal Thallium imaging in the presence of severe and extensive coronary artery disease**

Cardiology Update Symposium: New Frontiers in Cardiology-1997  
Four Seasons Hotel, Philadelphia, Pennsylvania (5/3/1997).

**Anticoagulation in unstable angina and acute myocardial infarction**

Family Practice Meeting  
Philadelphia Marriott Hotel, Philadelphia, Pennsylvania (9/13/1995).

**Participation in Scientific Meetings**

**American College of Physicians Internal Medicine 2014 Conference**  
Orange County Convention Center, Orlando, Florida (4/11/2014).  
**Faculty (Lecturer)**

**Transcatheter Cardiovascular Therapeutics Conference-2013 (TCT 2013)**  
The Moscone Center, San Francisco, California (10/27/2013).  
“Hot Topics in Cardiology: ACC Highlights for the Interventional, Invasive, and General Cardiologist” – Session II: “Focus on Prevention”  
**Faculty (Lecturer), Moderator and Discussant**

**Cardiology Update Symposium: New Frontiers in Cardiology-2000**  
The Westin Hotel, Philadelphia, Pennsylvania (4/29/2000).  
**Faculty, Moderator and Member of Discussion Panel**

**Cardiology Update Symposium: New Frontiers in Cardiology-1998**  
Four Seasons Hotel, Philadelphia, Pennsylvania (10/10/1998).  
**Faculty, Moderator and Member of Discussion Panel**

**Cardiology Update Symposium: New Frontiers in Cardiology-1997**  
Four Seasons Hotel, Philadelphia, Pennsylvania (5/3/1997).  
**Faculty**

**Current Trends in Cardiology-1996: Advances in the Diagnosis and Treatment of Cardiovascular Disease**  
Four Seasons Hotel, Philadelphia, Pennsylvania (3/30/1996).  
**Co-Director, Faculty and Member of Discussion Panel**

**Peer Reviews**

|                |  |
|----------------|--|
| 2015 - Present | Reviewer of medical manuscripts for the medical journal “Clinical Medicine Reviews in Cardiology”.                         |
| 2014 - Present | Reviewer of medical manuscripts for the medical journal “Enliven: Clinical Cardiology and Research”.                       |
| 2014 - Present | Reviewer of medical manuscripts for the medical journal “International Journal of Cardiology and Cardiovascular Research”. |
| 2014           | Reviewer of Abstracts for the Transcatheter Cardiovascular Therapeutics Conference-2014 (TCT 2014).                        |
| 2014           | Peer reviewer for Elsevier’s InOrder™ order sets on the topic of “Cardiac Arrest Hypothermia Protocol”.                    |
| 2013           | Peer reviewer for Elsevier’s InOrder™ order sets on the topic of “Dyslipidemia”.   |
| 2013           | Peer reviewer for Elsevier’s InOrder™ order sets on the topic of “Advanced Cardiac Life Support (ACLS)”.                   |
| 2013           | Peer reviewer for Elsevier’s InOrder™ order sets on the topic of “Acute Coronary Syndrome”.                                |

## Editorial Board of Medical Journals

2014 - Present      Enliven: Clinical Cardiology and Research

## Bibliography

### Original Articles:

Choi KJ, Tsomidou C, Lerakis S, Madanieh R, Vittorio TJ, **Kosmas CE**: Lipid interventions in aortic valvular disease. Am J Med Sci (In press).

**Kosmas CE**, DeJesus E: **Proprotein convertase subtilisin/kexin type 9 inhibitors: an emerging chapter in the field of clinical lipidology.** Enliven: ClinCardiol Res (In press).

Patel H, Madanieh R, **Kosmas CE**, Vatti SK, Vittorio TJ: Reversible cardiomyopathies. Clin Med Insights Cardiol 2015;9(Suppl 2):7-14.

Patel H, Madanieh R, **Kosmas CE**, Vatti SK, Vittorio TJ: **Complications of continuous-flow mechanical circulatory support devices.** Clin Med Insights Cardiol 2015;9(Suppl 2):15-21.

**Kosmas CE**, Frishman WH: **New and emerging LDL cholesterol-lowering drugs.** Am J Ther 2015;22(3):234-241.

Christodoulidis G, Vittorio TJ, Fudim M, Lerakis S, **Kosmas CE**: **Inflammation in coronary artery disease.** Cardiol Rev 2014;22(6):279-288.

**Kosmas CE**, Christodoulidis G, Cheng JW, Vittorio TJ, Lerakis S: **High-density lipoprotein functionality in coronary artery disease.** Am J Med Sci 2014;347(6):504-508.

Vittorio TJ, Fudim M, Wagman G, **Kosmas CE**: **Alpha-1 adrenoceptor-angiotensin II type 1 receptor cross-talk and its relevance in clinical medicine.** Cardiol Rev 2014;22(2):51-55.

Akhabue E, Thiboutot J, Cheng JW, Vittorio TJ, Christodoulidis G, Grady KM, Lerakis S, **Kosmas CE**: **New and emerging risk factors for coronary heart disease.** Am J Med Sci 2014;347(2):151-158.

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### Original Articles (Cont.):

**Kosmas CE**, Alkhawam H, El-Hunjul M, Wagman G, Kahn MR, Grady KM, Vittorio TJ: **Statin-mediated low-density lipoprotein lowering in chronic congestive heart failure.** Am J Med Sci 2014;347(1):14-22.

Mathew S, **Kosmas CE**, Siegel RR, Vittorio TJ: **Toxicity of abdominal fat.** Health 2013;5(8A3):96-99.

Savino JA 3rd, **Kosmas CE**, Wagman G, Vittorio TJ: **Evolution of the chronic congestive heart failure paradigm.** Cardiol Rev 2013;21(3):121-126.

Kahn MR, **Kosmas CE**, Wagman G, Serrao GW, Fallahi A, Grady KM, Vittorio TJ: **Low-density lipoprotein levels in patients with acute heart failure.** Congest Heart Fail 2013;19(2):85-91.

**Kosmas CE**, Tsomidou Ch, Lerakis S: **C-reactive protein, lipoprotein (a), homocysteine and lipoprotein-associated phospholipase A2 as risk factors for coronary heart disease.** Iatriki 2012;101(6):395-400. [In Greek with English summary].

Dangas G, O'Connor D, Firwana B, Brar S, Ellozy S, Vouyouka A, Arnold M, **Kosmas CE**, Krishnan P, Wiley J, Suleman J, Olin J, Marin M, Faries P: **Open versus endovascular stent graft repair of abdominal aortic aneurysms: a meta-analysis of randomized trials.** JACC Cardiovasc Interv 2012;5(10):1071-1080.

Lanier GM, Vaishnava P, **Kosmas CE**, Wagman G, Heinsch R, Vittorio TJ: **An update on diastolic dysfunction.**  
Cardiol Rev 2012;20(5):230-236.

Wagman G, Fudim M, **Kosmas CE**, Panni RE, Vittorio TJ: **The neurohormonal network in the RAAS can bend before breaking.**  
Curr Heart Fail Rep 2012;9(2):81-91.

**Kosmas CE**, Skliros D, TsomidouCh: **The role of omega-3 fatty acids in cardiovascular disease.**  
Iatriki 2012;101(1):16-27. [In Greek with English summary].

**Kosmas CE**, Philippou C: **HDL functionality: a new chapter in the field of clinical lipidology.**  
Iatriki 2011;100(5-6):247-252. [In Greek with English summary].

Charitos C, Nanas JN, Nanas SN, Chatzigeorgiou I, Alevizakos N, **Cosmas K**, Mouloupoulos SD: **Right and left ventricular interaction in ventricular fibrillation with mechanical maintenance of the circulation.**  
J CardiovascSurg (Torino) 1998;39(3):363-366.

## Bibliography

### Original Articles (Cont.):

**Kosmas CE**, Mallozzi M, Moten M, Banka VS: **Clinical symptomatology of coronary artery disease and results of exercise thallium scintigraphy: gender-related differences.**  
Indian Heart J 1997;49(5):497-501.

**Kosmas CE**, Ryder RG, Poon MJ, Zelenkofske SL, Banka VS: **Time-limited efficacy of pacing electrodes following open heart surgery.**  
Indian Heart J 1996;48(6):681-684.

**Kosmas CE**, Dalessandro DA, Langieri G, Rubin AM, Rials SJ, Marinchak RA, Kowey PR: **Monomorphic right ventricular tachycardia in a patient with mitral valve prolapse.**  
Pacing ClinElectrophysiol 1996;19(4 Pt I):509-513.

**Kosmas CE**, Mazuz M, Rubin AM, Marinchak RA, Kowey PR: **Wide complex tachycardia in a man with coronary artery disease.**  
Choices in Cardiology 1995;9(1):15.

**Kosmas CE**, Rubin AM, Rials SJ, Marinchak RA, Kowey PR: **Abnormal rhythm strip in a man with heart failure and ventricular tachycardia.**  
Choices in Cardiology 1994;8(7):205.

Nanas JN, Charitos C, Poyiadjis A, Anastasiou-Nana M, **Cosmas C**, Alevizakos N, Laoutidis G, Mouloupoulos S: **Maintenance of circulation during ventricular fibrillation with the simultaneous use of two "counterpulsation" devices.**  
ASAIO Trans 1990;36(3):M395-M397.

Poyiadjis A, Nanas J, Nanas S, Charitos C, Kontoyiannis D, Melkaoui A, **Cosmas C**, Mouloupoulos SD: **Hemodynamic effects of the simultaneous use of para-aortic counterpulsation device and intra-aortic balloon pump in graded heart failure.**  
Hell Cardiol Rev (Athens) 1990;31:18-25. [In Greek with English summary].

## Bibliography

### Book Contributions:

**Kosmas CE**: Contributor in "**Review of obesity and bariatric surgery: Essential notes and multiple choice questions**", Kini S and Rao R (eds.). London, New York: Informa Healthcare, 2012.

**Kosmas CE**, Banka VS: **Non-surgical coronary revascularization: Evolution of catheter-based techniques and role of the plain-old balloon angioplasty.**  
In Munjal YP (ed.): Medicine Update 1997. New Delhi, The Association of Physicians of India, 1997:98-107.

## Bibliography

### Abstracts

**Kosmas CE**, Mallozzi M, Moten M, Banka VS: **Clinical symptomatology of coronary artery disease is less predictive of a positive exercise thallium test in women than in men.**  
J Investig Med 1996;44(3):285A.



Banka VS, Kosmas CE, Sharma V: **Additive antiproliferative effects of calcium channel antagonist, HMG Coenzyme A reductase inhibitor and angiotensin converting enzyme inhibitor on human coronary smooth muscle cells.**

J Investig Med 1996;44(3):315A.

Sharma V, Kosmas CE, Banka VS: **Anti-proliferative effect of simvastatin on human coronary smooth muscle cells: comparison with lovastatin.**

Circulation 1995;92(suppl I):I-18.

**Kosmas CE, Mallozzi M, Banka VS, Moten M: Clinical symptomatology is less predictive of coronary artery disease in women than in men.**

J Investig Med 1995;43(supplII):405A.

**Kosmas CE, Ryder RG, Poon MJ, Banka VS, Zelenkofske SL: Usefulness of pacing electrodes following open heart surgery.**

2nd Scientific Conference of the Association of Cardiovascular Surgeons of Ukraine, Kiev, 1994, page 172.

Nanas J, Charitos C, Poyiadjis A, Nanas S, Kontoyiannis D, **Cosmas C**, Mouloupoulos S: **Maintenance of circulation during ventricular fibrillation with the simultaneous use of two “counterpulsation” devices.**

American Society for Artificial Internal Organs, 36th Annual Meeting, Washington, D.C., 1990, Page 52.

Nanas J, Poyiadjis A, Kontoyiannis D, Melkaoui A, Stamatopoulos G, Charitos C, Nanas S, **Cosmas C**, Mouloupoulos S: **Hemodynamic effects of the simultaneous use of two counterpulsation pumps in various stages of heart failure.**

10th Panhellenic Cardiology Conference, Athens, 1988, page 63. [In Greek].

## Alternative Media

### Internet

1997 – 2001

Member of the Expert Panel in Cardiovascular Disease at the Pharmaceutical Information Network (<http://www.pharminfo.com>)

*The Pharmaceutical Information Network was a healthcare website with a mission to improve healthcare by delivering products and services that provided reliable digital clinical data and up-to-date information to healthcare professionals and consumers. Expert panels from different medical specialties participated in on-line clinical discussions with other medical professionals and answered on-line medical questions from patients all over the world.*

### Television

2011 – 2014

Host of the Medical Program “Health Concerns”, sponsored by the Mount Sinai Medical Center on the 24-hour National Greek Television Channel (NGTV-Channel 545) in New York

*The Medical Program “Health Concerns”, sponsored by the Mount Sinai Medical Center, included discussions with experts from different medical specialties regarding topics of interest within their area of expertise. The experts also answered live call-in questions from the television audience. [In Greek].*

2008 – 2010

**Host of the Medical Program “Hippocrates’ Forum”,** sponsored by the Cardiovascular Group “Cardiovascular Associates of New York” and the Lenox Hill Hospital on the 24-hour National Greek Television Channel (NGTV-Channel 545) in New York

*The Medical Program “Hippocrates’ Forum”, sponsored by the Cardiovascular Group “Cardiovascular Associates of New York” and the Lenox Hill Hospital, included discussions with experts from different medical specialties regarding topics of interest within their area of expertise. The experts also answered live call-in questions from the television audience. [In Greek].*

## Alternative Media

### Television(cont.)

2004 – 2008  
Host of the Medical Program, sponsored by the Kyrenia Cardiovascular Center and the New York Hospital Queens on the 24-hour National Greek Television Channel (NGTV-Channel 545) in New York

*The Medical Program, sponsored by the Kyrenia Cardiovascular Center and the New York Hospital Queens, included discussions with experts from different medical specialties regarding topics of interest within their area of expertise. The experts also answered live call-in questions from the television audience. [In Greek].*

2000 – 2002  
**Guest Specialist in Cardiovascular Disease** on the Medical Program, sponsored by the Kyrenia Cardiovascular Center and the New York Hospital Queens on the 24-hour National Greek Television Channel (NGTV-Channel 545) in New York

Cardiovascular topics included:

|            |  |
|------------|--|
| 3/27/2002  | <b>Heart Murmurs</b>   |
| 1/16/2002  | <b>Syncope</b>   |
| 11/14/2001 | <b>Acute Myocardial Infarction</b>   |
| 10/24/2001 | <b>Hypercholesterolemia</b>  |
| 6/20/2001  | <b>Cardiac Pacemakers</b>  |
| 5/16/2001  | <b>Valvular Heart Disease - Cardiac Arrhythmias - Hypertension</b>                               |
| 2/28/2001  | <b>Management of patients with acute myocardial infarction after discharge from the hospital</b> |
| 12/27/2000 | <b>Effect of extreme weather conditions on patients with coronary artery disease</b>             |
| 11/15/2000 | <b>Endocarditis - Pericarditis</b>   |
| 10/18/2000 | <b>Atrial Fibrillation</b>   |
| 10/11/2000 | <b>Heart Failure</b>   |
| 9/13/2000  | <b>Coronary Artery Disease - Cardiac Arrhythmias</b>   |

## Alternative Media

### Television(cont.)

10/2/2001  
Guest Specialist in Cardiovascular Disease on the medical program “Correct Motion-Better Health” on the 24-hour National Greek Television Channel (NGTV-Channel 545) in New York

*The medical program “Correct Motion-Better Health”, sponsored by the physical therapists Dimitrios Kostopoulos, PT, PhD and Konstantine Rizopoulos, PT, FABS and the organization Hands-On Physical Therapy, PC, included discussions with experts from related medical specialties regarding topics of interest within their area of expertise. The experts also answered call-in questions from the television audience. [In Greek].*

Subject: **Coronary Artery Disease**

## Radio

5/3/2014  
Guest Specialist in Cardiovascular Disease on the medical program “Health and Life” on the Greek-American radio station COSMOS FM (WNYE 91.5 FM - New York)

*The medical radio program “Health and Life” is an informative series on various medical issues. In addition, medical news are presented and medical advice is given by experts from different medical specialties. [In Greek].*

Subject: **The significance of HDL Cholesterol**

2/26/2011 and 3/7/2009

**Guest Specialist in Cardiovascular Disease** on the medical program “Health and Life” on the Greek-American radio station COSMOS FM (WNYE 91.5 FM - New York)

Subject: **Coronary Artery Disease**

9/23/2000

**Guest Specialist in Cardiovascular Disease** on the medical program “Praise of Health” on the bilingual Greek-American radio station AKTINA FM (WNYE 91.5 FM - New York)

The medical radio program “Praise of Health” was an informative series on various medical issues. Experts from different medical specialties discussed topics of interest within their area of expertise and answered live call-in questions from the radio audience. [In Greek and English].

Subject: **Coronary Artery Disease**

## Alternative Media

### Newspapers-Magazines:

2012 – 2013

**Regular contributor** to the medical column “Health Tribune” in the “*Magazine*” of the Greek-American newspaper “The National Herald”. [In Greek].

2/2002

Article entitled “**Coronary artery disease - Etiology, symptoms and treatment**” in “*Eseis*”, a Greek-American magazine. [In Greek].

11/11-12/2000

Article entitled “**What is coronary artery disease**” in “*Proini*”, an Independent Greek-American daily newspaper. [In Greek].

### Constantine E. Kosmas, M.D., Ph.D.

Constantine E. Kosmas, M.D., Ph.D., FACC, FACP is a Clinical/Academic/Non-Invasive cardiologist and Clinical Lipidologist, currently serving as the Director of Lipid Clinic at a large private practice in New York (Cardiology Unlimited, P.C.) and he is affiliated with Mount Sinai Medical Center as an Assistant Clinical Professor of Medicine. He was born in Athens, Greece. He graduated with “Excellent” from the University of Athens Medical School, Athens, Greece and he was also granted a doctorate (Ph.D.) by the University of Athens Medical School. The title of his doctoral thesis was: “Substitution of the left and right ventricles by counterpulsation pumps during ventricular fibrillation. Mechanism of the hemodynamic effect of the right ventricular pump”.

Dr. Kosmas completed his residency in Internal Medicine at St. John’s Episcopal Hospital, Far Rockaway, NY and his fellowship in Cardiology at Episcopal Hospital, Philadelphia, PA. Prior to his current employment, he has served as Assistant Professor of Medicine at Icahn School of Medicine at Mount Sinai and Medical Director of Mount Sinai Advanced Cardiovascular Group, as well as Clinical Assistant Professor of Medicine at the Medical School of the University of Pennsylvania and at the Weill Medical College of Cornell University. Dr. Kosmas has also served as Director of Clinical Services and Associate Director of Nuclear Cardiology at Episcopal Hospital, Philadelphia, PA, as well as Acting Director of Coronary Care Unit at New York Hospital Queens, Flushing, New York.

In addition to his expertise in Preventive Cardiology/Clinical Lipidology and Nuclear Cardiology, Dr. Kosmas has been also involved in “Chest Pain protocols”, including triage of patients with chest pain in the Emergency Department, as well as management protocols of Acute Coronary Syndrome (ACS) patients in CCU. He was actually invited to speak at the Annual American College of Physicians (ACP) Conference in Orlando, FL (April 11, 2014) on the subject of “Chest Pain in the Hospital”.

Dr. Kosmas holds Board Certifications in Cardiovascular Disease, Nuclear Cardiology and Clinical Lipidology. He has also been extensively involved in cardiovascular research with several publications in the medical literature and numerous lectures in academic institutions, especially on lipid-related subjects. Dr. Kosmas serves as a Peer Reviewer for several medical journals and he is also a member of the Editorial Board of the medical Journal “Enliven: Clinical Cardiology and Research”.

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