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# Primary Coronary Intervention in acute ST segment elevation myocardial infarction. The Onassis Cardiac Surgery Center experience

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Primary coronary intervention (p-PCI) is currently the treatment of choice of acute myocardial infarction with ST-segment elevation (STEMI). However, experienced interventional cardiologists and adequate laboratory coverage are not available in all hospitals. At the OCSC we are privileged in having the requirement available around the clock.

We recorded the basic characteristics of patients who underwent p-PCI, such as age, sex, risk factors, STEMI location and the characteristics of the respective coronary intervention (time after STEMI, situation of coronary arteries, angiographic success, clinical success and MI-complications) during the period January 2005 - March 2008.

At the 1st Cardiology Department 28 p-PCIs were managed in 2005, 18 in 2006, 11 in 2007 and 4 in January-March 2008 (total 61 p-PCIs). P-PCI was performed around the clock. The average time period from pain-onset to hospital admission and the average door-to-balloon time were 163 (±51) and 112 (±33) min, respectively. Forty-seven pts (78%) were male, mean age was 60.7±2.8 years. Thirty-eight pts (62%) were smokers, 9 (15%) ex-smokers and 14 (23%) non-smokers. Dyslipidemia was present in 48 (79%), of whom 22 were on statin therapy. Family history of coronary artery disease (CAD) was positive in 25 (41%); 30 (49%) had systemic arterial hypertension and 11 diabetes mellitus, two of whom were insulin-dependent. Fourteen pts (23%) had already suffered from at least one previous MI. The number of diseased vessels was 1.7±0.2; 34 pts (57%) suffered from multivessel-disease. The location of the AMI was anterior in 21 pts, lateral in 4, inferior in 29, anterolateral in 2 and in the remaining 5 pts there was a combination of these locations. A right ventricular infarct was diagnosed in 2 pts with an inferior location. The Killip Class was I in 46 pts, II in 12, III in 1 and IV in 2 pts. The vessel with the culprit lesion was the left main in one patient, the left anterior descending in 27, the left circumflex in 6, the right coronary artery in 26 and a saphenous vein graft in one patient. The number of lesions per vessel was 1.4±0.2. In three patients were found calcified lesions.

Nine patients received stents in more than one vessel: The total number of stents patient were 1.6±0.2. IIb/IIIas were administered to 33 pts (54%). There was no interventional mortality. One death during hospitalization (4th day) was observed in a patient with known severe ischemic cardiomyopathy (ejection fraction - EF - 20%). He had all the risk factors for coronary artery disease and an old STEMI. No cases of subacute thrombosis during hospitalization were observed. Thirty-seven pts (62%) developed Q-wave on ECG before discharge from the hospital. No emergency coronary artery bypass grafting was needed and there were no vascular complications. Four pts needed to receive one blood unit and one patient received 2 blood units. Forty-one pts (67%) had EF over 40% at discharge.

Primary coronary angioplasty can be carried out with excellent results in STEMI. Future efforts should be addressed at minimizing delays, wider implementation of this method and optimizing cardiac protection. The National Health System of Greece is currently undertaking a systematic coverage of Attica through a network of hospitals.

# 28th Congress of the International Society for Heart Research

**Dennis V Cokkinos, MD, FESC, FACC, FAHA,**
Director 1st Cardiology Dept, OCSC, Professor Emeritus, University of Athens

The 28th Congress of the International Society for Heart Heart Research - European Section was organized in Athens in May 28 until 31, this year. We have been privileged to organize this important meeting on basic research. Every effort was made not only to offer a very rich and varied scientific content but also to show the cultural and natural beauties of Athens. On Thursday until Saturday noon there were 23 Scientific sessions on very important current subjects, such as inflammatory cytokines, cardiac progenitor cells, G proteins coupled receptor signalling, ischemic reperfusion, cellular volume control, oxygen sensing, vascular protection, excitation - contraction coupling, cycloxygenase-2 risks and benefits cardiac and vascular mechanisms, myofilament mutations and misfolding, pacemaker activity, sarcoplasmic reticulum and calcium handling, ion currency and electric homeostasis, electrophysiological alterations, mitochondrial reactive oxygen pathways, postconditioning, matrix metalloproteinases, cardiac hypertrophy and atrophy, transcriptional regulations. Two sessions were devoted to presenting the current research data in Greece both in clinical and basic research.

A pre-symposium meeting with the general title "Thyroid hormones and the heart", was very successfully organized by the 1st Cardiology Department of the Onassis Cardiac Surgery Center and the Pharmacology Department of the University of Athens. Two cultural lectures were offered by Professor Denis Noble "The Music of Life" and Professor Stefanos Geroulanos "The Hospices of Asklepieios in Ancient Greece". Overall there were 225 moderated posters presented and very intensively discussed in 21 moderated poster sessions. Three poster prizes were awarded for the best presentations.
The opening ceremony was held in the historical ceremonial Great Hall of the University of Athens on Wednesday May 28th from 18:00 to 20:00 during which the President of the Hellenic Republic Dr. Karolos Papoulias inaugurated the Meeting. The medals of merit of the Society were awarded and there were two keynote lectures, one in basic research on "Calcium cycling in the cardiomyocyte: A matter of life and death" by Professor Evangelia Kranias and a cultural one on "The Hippocratic Oath" by Professor Dennis V. Cokkinos. The Chorus of the University of Athens performed well known Greek songs and the Byzantine Hymn: *To Victory (Τη υπερμάχω)*.

Also before the young investigators award competition contest on Thursday morning, three outstanding personalities were honoured for their overall contribution to Hellenic Research: Professors S. Moulopoulos, C. Sekeris, and Professor - Academician G. Skalkeas. The congress ran smoothly and left all the all participants with excellent impressions but furthermore hopes to foster collaborations between centers of excellence in Europe and in Greece. There were approximately 450 participants from all over the world. Fifty-one Bursaries for outstanding young investigators were offered to enable them to attend this meeting. It was held in the beautiful Athens Concert Hall (Megaro Mousikis). Many prestigious Institutions placed the congress under their auspices, in alphabetical order the Alexander S. Onassis Benefit Foundation which was its major sponsor by far, Biomedical Research Foundation of the Academy of Athens, the Hellenic Society of Cardiology, the Medical School of University of Athens and the Onassis Cardiac Surgery Center.

# European Summit on Cardiovascular Disease Prevention

## 17-18 January 2008, European Heart House, European Society of Cardiology Headquarters Sophia Antipolis, France

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Cardiovascular disease (CVD), which causes 49% of deaths in Europe, is the main cause of death in women in this continent and costs the European Union over €169 billion a year. CVD is also a major cause of disability and of reduced quality of life. The European Summit was one of the several initiatives to encourage countries to educate their population, promote the benefits of a healthy life style, and allocate an adequate budget to preventive care and rehabilitation. Two hundred delegates of 46 countries and 27 health organisations participated at the European Summit on CVD Prevention. The agenda included several important topics such as the European Charter on Heart Health.
With the support of the European Commission and the World Health Organization (WHO), the European Heart Network and the European Society of Cardiology invited concerned European and International Organizations to:

*Sign up to a European Charter on Heart Health,*
*Commit to combatting early death and suffering from cardiovascular disease through prevention,*
*Act on the Valentine's Day Declaration from the Winning Heart Conference of 14 February 2000*

**'Every child born in the new millennium has the right to live until the age of at least 65 without suffering from avoidable cardiovascular disease'**

The European Heart Health Charter consists of 18 articles aiming at reducing the burden of cardiovascular disease and to reduce inequities and inequalities in disease and inequities between countries.

The signatories (Article 3) recognise that CVD is a multifactorial condition and it is essential that all risk factors and determinants are addressed at societal and individual levels.

**Characteristics associated with cardiovascular health include:**

- No use of tobacco (0)
- Physical activity: at least 30 minutes 5 times a week (30)
- Healthy eating habits (5 fruits & vegetables)
- No overweight
- Blood pressure below 140/90 mm Hg
- Blood cholesterol below 5 mmolL (190 mg/dl)
- Normal glucose metabolism
- Avoidance of excessive stress

These characteristics can be summarized according to the Luxembourg Declaration, June 2005 as the **European Heart Health Number 0 30 5 140 90.**

By the end of 2008 all European Countries will have subscribed to the *European Heart Health Charter* and will have set up a Joint National Task Force to take the necessary actions to implement it. Secondary prevention and rehabilitation policies were part of the enclosing agenda. The results of the multicenter study EuroASPIRE, which investigated risk factor management and primary and secondary prevention across 22 European countries, showed that "A handful of pills is not enough" to deal with the burden of CVD. The importance of lifestyle modification, education, risk factor management, psychosocial care, cardio-protective drug therapy and long term management strategy together with rehabilitation, was pointed out. The increased benefits of rehabilitation in reducing morbidity and mortality and improving quality of life of patients with cardiovascular disease were reported, and action was called upon so that:

**'Every hospital dealing with cardiovascular disease to support and provide cardiac rehabilitation programmes'**

The development and implementation of comprehensive health strategies as well as measures and policies on European, national, regional and local level to promote prevention and rehabilitation constitute a common European Strategy in addressing the burden of cardiovascular disease.

# Late Drug Eluting Stent Thrombosis Considerations and Practical Implications

**Gregory Pavlides, MD, FACC,** Deputy Director, 1st Cardiology Department, Onassis Cardiac Surgery Center

The introduction of drug eluting stents (DES) into clinical practice in 2002 revolutionized the practice of interventional cardiology. The last bastion of the treatment of coronary artery disease (CAD) by percutaneous coronary intervention (PCI), restenosis, finally fell. This led to a wide acceptance of DES in daily practice, approaching in the US 85% and in Europe >50% with the only concern at the time the higher cost of DES. Although the initial studies included only patients with native coronary arteries involved, it is estimated that 60% of DES use today involves "off-label" patients. "Off-Label" indications include types of lesions and patients excluded from the original randomized trials, such as patients with left main disease, acute MI treated with primary PCI, in-stent restenosis, lesions of saphenous vein grafts, bifurcation lesions and chronic total occlusions. However 4 years later, analysis of the data of the original studies, as well as data from large registries have suggested that implantation of DES is associated with a higher rate of late and very late stent thrombosis when compared with bare metal stents (BMS).

In the different trials the definition of stent thrombosis differed, but it was invariably observed that stent thrombosis could occur beyond 30 days from implantation (late thrombosis), or even beyond 12 months (very late stent thrombosis). It should be noted that stent thrombosis with BMS is rare after 2 weeks from implantation. Although the rate of DES thrombosis is very low, its significance cannot be underemphasized because of its life-threatening consequences. In the randomized trials it appears that from year 1 to 4 there is a 0.2% thrombosis rate per year for the DES. In the real world practice this seems to be slightly higher, estimated to 0,6% per year for the DES while is practically 0% for BMS. At the end of the 4th year the overall rate of DES thrombosis approaches therefore 3%. In almost half (45%) of these cases this complication can be fatal. The strongest independent predictor of stent thrombosis is the premature discontinuation of dual antiplatelet therapy (aspirin and clopidogrel). Others include multiple overlapping stents, bifurcation stenosis with 2 stents used, a low ejection fraction. The presumed mechanism of late susceptibility to stent thrombosis is delayed or incomplete reendotheliazation and possibly an inflammatory response to the stent polymer. Other factors such as strut fractures and late stent malapposition may contribute.

When the results of the Cleveland Clinic were examined, all-cause mortality over 4.5 years in 8.032 patients was significantly lower with DES (0.62, 95% CI 0.53-0.73, p<0.0001). In a 4 year survey from the Bern and Rotterdam University Clinics, late stent thrombosis in DES was found to occur steadily at an annual rate of 0.4% to 0.6% for up to 4 years. For early thrombosis diabetes mellitus and for late thrombosis acute coronary syndromes, younger age and paclitaxel stent implantation were independent factors.

In a practical level, have all these data changed the rate of DES use and in a more general approach the way we practice today? Although the slightly higher thrombosis rate of DES is not accompanied with increased mortality, the answer is yes, at least until newer generation DES solve the limitations of the first generation. In selecting patients for PCI several requirements should be taken into account: First, objective evidence of cardiac symptoms and ischemia must be present in accordance with published guidelines for PCI and second, it must be remembered that the patients included in the major randomized trials of DES had relatively low risk lesions and clinical characteristics. Proper patient selection currently should involve an assessment of the balance between restenosis risk and thrombosis risk and their individual consequences. Small vessels, long lesions, chronic total occlusions and in-stent restenosis after a BMS are good indications for DES since they have a high restenosis rate. Other factors such as diabetes, chronic kidney disease saphenous vein grafts increase the risk of restenosis but also have a higher risk for late stent thrombosis. In these cases the risk-benefit ratio should be carefully assessed before a DES is placed. Third, consideration must be given to the patient's ability to comply with long-term dual anti-platelet therapy. Inability to comply or a reason for interruption soon after PCI is a contra-indication to DES. Finally, proper stent placement technique is mandatory for good expansion and full lesion coverage. If all the above are taken into account, the rate of DES use probably will not exceed 50% of all stents used.

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# Mechanical Circulatory Support at the Onassis Cardiac Surgery Center

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## A Brief History of Mechanical Circulatory Support

The introduction, in 1953, of cardiopulmonary bypass in cardiac surgery paved the way for the concept of mechanical circulatory support (MCS) for the failing heart. In the early 1960s, Drs. Kolff and Moulopoulos first developed the technique of arterial counterpulsation with an intra-aortic balloon for patients with heart failure.[1] The late 1960s marked the birth of true MCS, when in 1969 Dr. Denton Cooley implanted the first temporary total artificial heart (TAH) as a bridge to transplantation, in Houston, Texas.[2] Over the course of the following 40 years further refinements and newer devices were added to the MCS armamentarium. Last year marked the 25th anniversary of Barney Clark's implantation in Salt Lake City, Utah with the Jarvik-7 TAH for permanent support. He subsequently lived for 112 days on the device.[3] MCS devices are now designed for both short-term and long-term use, for a variety of heart failure etiologies including post-cardiotomy syndrome, end-stage dilated or ischemic cardiomyopathy, acute/fulminant myocarditis, postpartum cardiomyopathy, etc., utilizing various implantation techniques. Ventricular assist devices are used in selected patients to support either the left ventricle (LVAD) or both ventricles (BiVAD), depending on the level of support required.The longer-term devices have primarily been used as a "bridge to transplantation", but the landmark (late 1990s) REMATCH study showed considerably better survival in patients ineligible for cardiac transplantation when treated with a long-term implantable device for permanent support, as opposed to medical therapy.[4]

## The Onassis Experience

The Onassis Cardiac Surgery Center (OCSC) MCS program has had experience with several MCS devices since 1996, as shown in Table 1.


Patients with mechanical support devices and members of the Medical and Nursing Personel of the 1st Cardia Surgery Division and Transplantation Unit (January 2008).

*Table 1 - MCS and Devices at OCSC*

| Short-term device implantations | | Long-term device implantations | |
|---|---|---|---|
| Type of device and configuration | Nr of patients | Type of device and configuration | Nr of implants/Nr of deaths |
| **Abiomed** | | | |
| BVS | 2 | **Heartmate XVE** | |
| AB 5000 | 1 | LVAD | 5/1 |
| **ECMO** | 4 | **Novacor** | |
| | | LVAD | 5/3 |
| **Levitronix** | | | |
| BiVAD | 5 | **Berlin Heart Excor** | |
| LVAD | 2 | BiVAD | 21/3 |
| RVAD | 1 | LVAD | 5/1 |
| **Impella** | | | |
| BiVAD | 1 | | |
| LVAD | 2 | **Berlin Heart Incor** | |
| RVAD | 1 | LVAD | 5/0 |
| **Total Nr of VADs** | 19 | | 41* |

*Two patients were implanted with more than one type of long-term device and both ultimately died on a Berlin Heart Excor BiVAD

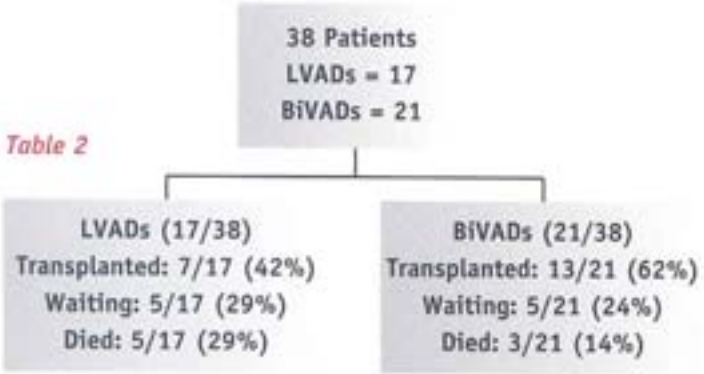
**OCSC Results**

At the time of this writing, 38 patients at OCSC have had 41 long-term devices implanted, with the intention of bridging them to cardiac transplantation (Table 2). Twenty patients have been transplanted, and 18 of these are alive and well. Thirty two out of the 38 patients (84%) were discharged home. Ten patients are currently at home, with 7 patients supported on the Berlin Heart Excor (5 BiVAD, 2 LVAD) and 3 patients on the Berlin Heart Incor (LVAD). Two ongoing patients have had their device for over 18 months each. The 30 day survival after initial implantation is 97%, and the 1-year survival (excluding transplanted patients) 72%. Both rates are substantially superior to the international figures. The OCSC patients experienced an acceptable rate of complications, usually infections and neurological events. The introduction of hospital-specific protocols for infection control and anticoagulation has further decreased the complication rate and precise anticoagulation is the essence of positive outcomes in this patient population. All patients are monitored frequently in the VAD Outpatient Clinic for ongoing or potential problems.

**Future of MCS**

The encouraging REMATCH results will contribute to further expansion of the MCS program at OCSC for patients who are ineligible for cardiac transplantation. Hundreds of patients worldwide have been implanted in recent years with the intention of permanent support. Oftentimes, however, patients become eligible for cardiac transplantation while on permanent device support due to improvement in organ function, body weight, etc. Other avenues under scrutiny are combinations of stem cell therapy with MCS, and various medical therapies combined with MCS in order to improve native heart function and therefore allow removal of the device without transplantation. The figures for patients weaned off of the long-term devices is still low (5-7 %).[3] Recent data indicate that better results are obtained when devices are implanted before end-organ damage or severe malnutrition intervenes. MCS is a rapidly evolving technology where new information is continually disseminated, aiming at smaller, improved devices. Such reports are already emerging[6].

*Table 2*

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# Asklepios - Asklepieia

**Prof. Stephanos Geroulanos,** Director, Surgical Intensive Care Unit, Onassis Cardiac Surgery Center, Former Professor of History of Medicine, Ioannina, Greece

Asklepios, the God of Medicine, was the son of Apollo and Koronis. The myth says that he was born via a caesarean section around the 13th c. B.C. At Homer's times he was still considered a famous physician. At the time of Hesiodus he was a Semi-God. In the beginning of the 6th c. B.C. he was worshipped as God in Epidaurus. Asklepios was killed by Zeus by means of a thunderbolt, due to the many complaints from Hades, the God of the Underworld. Hades complained to Zeus that due to the healing abilities and resuscitation of patients by Asklepios, his "clientele" was getting more and more reduced.

Almost all individuals in Asklepios's large family possessed medical knowledge and healing abilities. His wife Epione, soothed the pain, his daughter Hygeia was the Goddess of Health, and also his other daughters Panakea, and Iaso stood for Goddesses of Therapy.
Two of his sons, Machaon and Podaleirios are mentioned in Homer's Iliad as warrior-kings, who contributed to the Trojan war with ships and men. However, they were well-known also for their medical expertise and acknowledged as physicians; Machaon, as traumatologist, Podaleirios in dietetics and pharmacology.
After the Trojan war, Podaleirios arrived in Kos, where according to tradition, he founded the Asklepieion of Kos. Hippocrates is considered his 18th direct descendant.

The most famous healing temples of Asklepios, (approx. 400), Asklepieia, started to spread around the 6th c. B.C. At first in Trikka (today's Trikkala in Thessaly) or in Epidaurus and later in many other sites. By the 4th c. B.C. the Asklepios cult was spread all over the Mediterranean region, while more than 400 Asklepios sanctuaries have been discovered.
The most famous were the ones of Epidaurus (Peloponnese), of Pergamon in Ionia (Asia Minor) and in Kos (Dodecanese).

Asklepieia were built in carefully chosen sites, as a principle in a exquisite natural landscape, where running water was accessible. The building complex included shrines, baths, theaters, gymnasiums, stadium, palaistres (wrestling arenas), and other auxiliary administration buildings. The main building was usually the temple, in which the statue of Asklepios God was dominant.
The most important construction was the "abaton", the inaccessible incubation site, where the actual cure took place. After ritual cleansing, baths and sacrifices to the God and also close attendance by the priest-physicians for several days, the patient was put to sleep by appropriate potions. Then in his dream, he was visited by the God himself, who advised the patient about the treatment he had to follow. In some cases the patient was cured, in other cases he was operated on the spot. Prior abstinence from specific food and wine or a special diet to be followed was prescribed.

The most prominent medical teachers of the Greek ancient world were Hippocrates (460-377 B.C.) and Galen (130-199 A.D.) They had exercised their practice in Asklepieia. Hippocrates in that of Kos and Galen in that of Pergamon. In the case of Hippocrates his father Herakleides, as also his grandfather Hippocrates A' were chief physicians-priests in the sanctuary, while Galen was sent by his father, the architect Aelius Nicias, to study medicine near famous physicians at first to Pergamon and later on to Smyrna.

The cult of Asklepios ceased at around 3rd or 4th c. A.D., when Christianity abolished the twelve God cult of the ancient world and healing abilities were attributed to the divine powers of Jesus Christ.

# Education, counselling and monitoring of heart failure patients by a cardiac liaison nurse through regular telephone follow up communication

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Hospital readmission in chronic heart failure is often due to preventable factors, such as non-adherence to drugs and diet, inadequate social support, and failure to seek prompt medical attention when symptoms or signs worsen.[1,2] An increased frequency of hospitalisations is associated with a poor prognosis and a decreased quality of life for patients with chronic heart failure.[2] Many studies, one of them the DIAL trial, have shown that a telephone intervention program was effective in reducing the admissions for worsening heart failure.[3]

The Cardiac Liaison Nurse of the 1st Cardiology Department at the O.C.S.C. provides a similar intervention programme to heart failure patients since January 2004. All heart failure patients have been admitted to our hospital after cardiac decompensation. Patients and their families received formal education about their disease: the education session included description of symptoms and signs of heart failure decompensation, importance of self-monitoring of vital signs, diet and exercise counselling, effects of medications and importance of compliance, and measures to be taken in case of deterioration.

The telephone intervention starts after after discharge and is based on five main objectives: adherence to diet, adherence to drug treatment, monitoring of symptoms, control of signs of water and salt retention and daily physical activity. According to the telephone evaluation, the nurse can adjust the dose of diuretic with the co-operation of a cardiologist, or recommend non-scheduled medical or emergency visits. This telephone intervention by the cardiac liaison nurse seems to reduce readmissions for worsening heart failure. From the results of our study, significantly more patients in the control group than the intervention group were readmitted to hospital (for a shorter hospitalization duration, although total mortality did not significantly improve (Table 1).

The quality of life of heart failure patients can be much improved on top of optimal drug treatment through comprehensive programmes based on simple strategies such as a telephone intervention follow up by a cardiac liaison nurse.[3]

*Table 1*

| | Team A (n=50) | Team B (n=50) | P |
|---|---|---|---|
| **Deaths** | 10% (5/50) | 14% (7/50) | NS |
| **Readmissions mean±SD** | 24%±43.14 | 46%±50.34 | 0.01 |
| **Days in hospital mean±SD** | 3.66±11.55 | 9.88±18.76 | 0.02 |

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# Therapeutic use of music with the cardiac patient in the ICU

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Patients in the intensive care unit (ICU) frequently undergo negative psychological experiences including anxiety, depression, isolation, sleep deprivation, and periods of fluctuating consciousness with loss of orientation. Catecholamine levels are often elevated and frequently an autonomic imbalance ensues, reflected by higher heart rate variability (HRV). The physiologic consequences include tachycardia, hypertension, compromised immune function, slower healing, increased oxygen consumption, and utilization of higher doses of anxiolytic and narcotic agents, along with potential side effects.

The ICU cardiac patient who has undergone acute myocardial infarction (AMI), coronary interventions (PCI), or surgery is particularly at risk for autonomic imbalance that has negative effects on oxygen consumption and delivery, with possible resultant myocardial ischemia. The use of music for the cardiac ICU patient has been shown to have numerous benefits. Some hospitals have incorporated music into a complementary care program for the cardiac patient, involving guided imagery with gentle touch or massage, and music. One study showed that the benefits were significantly lower pain and tension scores on postop days 1 and 2, and lower total amount of analgesic use, although no differences in heart rate, blood pressure, or LOS were seen[1]. Another study showed that postop CABG patients exposed to music for three 20 minute sessions over 2 days experienced lower heart rates and systolic and

# Impressions from the Onassis Cardiac Surgery Center

**Dr Fred Schwartz MD**

My first visit to the Onassis Cardiac Surgery Center was 7 years ago (2001) when I came to give a presentation during a conference at Athens Moraiti School on the use of music with premature babies in the NICU, at the invitation of Dr. Thanassis Dritsas and Dr. Yannis Papadatos. It was quite apparent that this was an exceptional cardiac center both in terms of research and patient care. I left Athens with a feeling that Dr. Dritsas and I were like brothers, sharing in a lot of common interests and outlooks. We were in some way similar, looking at not just a part of the patient but the whole patient.

diastolic blood pressures, less anxiety, better sleep, and less pain on the 2nd postoperative day[2]. Music listening post CABG has been shown to decrease anxiety and decrease time to extubation[3].

The benefits of a 30 minute postoperative music session with pediatric open heart surgery patients have been shown to be decreased pain, lower heart rate and respiratory rate although no significant changes in blood pressure were seen[4]. Patients admitted to the ICU with a presumptive diagnosis of AMI were given three 20 minute headphone music sessions aver a 2 day period. Benefits were lower heart rates, increased peripheral temperatures and a lower incidence of complications (persistent chest pain, cardiac arrest, severe CHF, and pericarditis)[5].

Several years ago Piedmont Hospital in Atlanta, Georgia extended its central music server distribution into the ICUs. Our initial experience looking at outcome measures was that patients spent 5 hours less in the ICU, the cost of ICU care decreased by 8%, and there was a 10% decrease in the use of sedatives and narcotics[6].

A central hospital music system can be configured with music obtained from hard drive music servers, CDs, MP3 players, as well as internet radio stations. This music may be delivered to each patient area via analog signals connected to each music location, although the benefits of broadcasting digital music signals are that there is no loss of signal quality with distance. The music can be distributed to each patient location via the hospital's local area network, via coaxial cable, over WIFI (although limited by range), or distributed through the internet.

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Since that visit 7 years ago there has been a lot of interest in using music with cardiac patients; in the intensive care units (ICU), during stress exercise testing, after open heart surgery, in patients with neurocardiogenic syncope and undergoing cardiac rehabilitation. A few of years ago at Piedmont Hospital, we had set up a music delivery system that delivered music to all of our patients recovering open heart surgery and found that there were some small but significant benefits from this; less sedative and narcotic use, faster discharge from the cardiac ICU, and lower cost of care. A number of large cardiac surgery centers have set up complementary medical care programs for their patients that in addition to music, include other modalities such as music therapy, guided imagery and healing touch. These centers include those headed by Dr. Mehmet Oz at Columbia-Presbyterian Hospital, and Dr. Joanne Loewy, music therapist at Beth Israel Hospital in New York.

My visit to Athens this time was to give a presentation at the Onassis Cardiac Surgery Center on "Music and Medicine in the Operating Room and Intensive Care Unit: Research and Applications". After concluding my presentation I was very pleased at how receptive and sensitive many of the physicians and staff were. It is obvious that the Onassis Center is also on the cutting edge of many different modalities of treatment. I was very impressed by the use of recorded music in all of the ICUs and the availability of ancillary personnel to provide all types of services to promote the well being of the patients, both during their illness and in their recuperation. It is obvious that aesthetics are also held in esteem here. There is a sense of caring and I am honored to be in some way connected to this.

# The white coat

From the moment
you wear it
you can't take it off
it's always there
no matter where you are
no matter what you are doing
no matter where you are going
in your office
in the hospital wards
or in your social activities.

You wear it
in any moment
in any time
white in color
white in spirit
the way you think
the way you act
your medical coat
is there with you
white in color
white in spirit.

Always ready
to soften the pain
to cure the malady
to console the soul
to struggle against the charon.

Even
in your dreams, in your visions
you are there
wearing the white coat.

From the moment
you wear it
you can't take it off
it's there
for ever and ever
just because
you are the life-long physician
ready to help
to treat
to struggle
at any moment
at any time.

Fotios Pavlatos, MD
July 30, 2007

WRITTEN BY PROFESSOR FOTIOS PAVLATOS, MD

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