
Achievements With Cardiopulmonary Resuscitation In The Last 21 Years In The Kingdom Of Saudi Arabia

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Abstract

The objective of this review is to establish a Framework about the educational activities of the Cardiopulmonary Resuscitation. The activities are organised and conducted by the (CPR) National Committee of the Saudi Heart Association (SHA) and determine if it has had any effect on the survival rate in daily hospital work Further, the review puts forward recommendations regarding the key to success for future implementations and improvement in the outcome of heart attacks in the Kingdom of Saudi Arabia (KSA).

Cardiopulmonary resuscitation (CPR) was introduced into the Kingdom of Saudi Arabia in the 1979 through the curriculum of the medical students. The Author and some of his friends obtained their BLS instructor certificates through ARAMCO center in 1982. The real birth of CPR in the Kingdom was initiated in 1983 following a visit by the author to the Dallas headquarters and making an official invitation for the American Heart Association (AHA) to conduct the first instructor course in CPR. This was achieved in the spring of 1984 under the auspices of the Postgraduate Center of the College of Medicine. Later, the activities of CPR were transferred to the newly founded Saudi Heart Association (SHA) in 1985 and currently maintaining these activities. The National CPR committee chaired by the author continues expanding its activities throughout the Kingdom of Saudi Arabia and most recently to the Gulf states. The number of courses organized, conducted, and reported exceeded 765 for providers and instructors in BCLS and ACLS. This resulted in certification of more than 1,000 and more than 250 instructors in basic and advanced CPR respectively

The number of recognized centers established in the Kingdom and the Gulf region reached 96 for BLS and 34 for ACLS. Not all of the centers are active for a number of reasons. Over 80% are still maintaining their status as training centers and are actively involved in providing specific courses according to their classification. The number of certificates has exceeded 200,000. The first 13 years was limited and only 85,000 certificates were issued, while the last 8 years showed a tremendous increase to 203,000 certificates.

INTRODUCTION

Cardiopulmonary Resuscitation (CPR) was introduced in the United States in 1966 when the National Academy of Sciences National Research Center (NAS NRC) Conference on CPR recommended training of medical, allied health, and other professional medical personnel in the application of external chest compression techniques in accordance with the standards of the American Heart Association (AHA).² The public at large was furnished with training in Basic Life Support (BLS) in 1973. The first adult Advanced Cardiac Life Support (ACLS) course was organized in 1974. Other courses in Advanced Life Support, such as pediatric and neonatal, were introduced later. Mortality due to cardiovascular causes decreased in the United States following the implementation of CPR techniques.³ Two decades later, CPR was introduced into the Kingdom of

Saudi Arabia (KSA). The start was modest. In 1979, CPR (BCLS and ACLS) instruction was provided to undergraduate medical students using audiovisual aids. The principal instructor (MAS) earned his BLS Instructor's certificate from the AHA in 1982. At the same time, limited activities of CPR (Basic only) were organized in a very dosed community. In the summer of 1983 the author contacted the headquarters of the American Heart Association and invited them to hold in the spring of 1984 the first CPR instructor courses. This invitation was made by the College of Medicine, King Saud University (KSU).d the first CPR instructor's courses in BCLS and ACLS in the KSA. Twenty four physicians of different specialities from various hospitals in the KSA enrolled in this course 18 candidates were certified as instructors, two of them were faculty members of the College of Medicine and were selected as Associate Faculty to the AHA.⁴ Thus, the

Postgraduate Center, College of Medicine, King Saud University became responsible for organizing and conducting all different courses in BCLS and ACLS for medical and non medical personnel throughout the Kingdom. These educational activities started immediately following the first AHA instructor level course and continued until the Saudi Heart Association (SHA) was established and recognized in 1985. Since that time, the SHA has become solely responsible for these activities as well as for initiating other activities, such as conferences, research, journals, etc. Two additional courses were organized in 1987 and 1993 respectively, in order to update the faculty members of the SHA with the new guidelines in CPR and Emergency Cardiac Care (ECC).⁷ In the three courses conducted by the AHA in Saudi Arabia the instructors were senior faculties and the chairmen of the AHA.

The SHA appointed the principal author as the Chairman of the National CPR Committee. The Committee's main responsibility has been to continue and establish plans to expand CPR educational activities throughout the Kingdom for medical and non medical personnel in both the Arabic and English languages. The members of the National CPR Committee were selected from all regions of Saudi Arabia and from different backgrounds of medicine. The committee decided to organize and conduct only adult CPR courses (Provider and Instructor) for BCLS and ACLS. These courses were divided as follows:

1. BLS (for medical and medical personnel);
2. ACLS (for medical, Emergency Medical Service (EMS) personnel, and nurses in critical care areas). These courses have been provided either separately or combined.

METHODS

Data for 21 years were abstracted and analysed. Regularly, data from each Center were received and filed. The National Heart Committee (NHC), provide separate file for each center, thus record of activities, of each center is intact. This ultimately making the annual statistics easier to produce. Analysis of the activities of each center was carried out to produce statistics of different regions or hospitals beside the NHC of the SHA and the Department of Anaesthesia, College of Medicine, KSU. The NHC alone managed to organise and conduct varieties of courses including provider and instructor for BLS and ACLS and is the sole body

responsible to establish accredited training centers in the Kingdom and the surrounding states. Recently the activities of the NHC was limited to a program only of instructor courses and establishing new accredited centers at the same time giving the chance to other big centers such as KFSH & RC and NGH, al-Mashura skills training center, etc. This move was recently initiated and given to some certain facilities who have potentials to expand on their activities throughout the kingdom by organizing and conducting provider courses only. As the years passed, the hospital accreditation system was enforced throughout the following steps

1. Long-term policy of the SHA which illustrates that all hospitals must have an accredited BLS training center, while regions must have accredited ACLS training centers. This was achieved totally with the other government hospitals, to some extent with hospitals of the private sector and to a lesser extent in the hospitals of the M.O.H.
2. In 2001 the SHA introduced fees for training centers and stipulated rules and regulations for it which included the duties of the center and the duties of the SHA. An informative booklet on CPR in the kingdom was produced and recently has been revised, updated and upgraded. These two measures helped a great deal in maintaining quality of work of the training centers regular statistics and supervision by the DHA.
3. ARAMCO Medical Complex requirement from all private hospitals in the Kingdom of Saudi Arabia and the Gulf states dealing with them must have all their staff be certified in CPR and the hospital must be accredited and affiliated with Saudi and American Heart Associations.
4. Saudi Council for Health Specialties recent enforcement of obtaining BCLS and ACLS through different specialties or through the SHA. The request of 90 credit hours for renewal of permit to practice in the Kingdom must have 16 credit hours of CPR. This is applied on Doctors, Dentists, Pharmacists, Critical Care Nurses and Paramedics while only basic for all categories of medical personnel working in the health care delivery system in Saudi Arabia.
5. The CPR national committee produced two issues

of CPR in the kingdom of Saudi Arabia and the Gulf States. The book contains information in 48 pages on development of training center, annual fees to the SHA, price list of courses and educational materials plus other relevant matters. The second issue was recently produced and contains more elaborate and detailed information in 140 pages on new information pertinent to CPR in the Kingdom and the Gulf States in order to control the quality of the training and the certification provided.

Arabic version of BLS proviver and instructor books while using the AHA's books for BLS and ACLS instructor courses. These education materials at cost, without profit.

5. Supporting facilities such secretarial and other essential office facilities that help to continue, maintain, and expand these educational activities.
6. A CPR coordinator who is responsible to organise and conduct ascheduled training programmes and sending regularly the statistic of their center to the NHC.
7. CPR committee who will responsible for establishing the CPR activities including collecting data, reviewal of the existing CPR policy and procedures, communicating with the SHA etc.

DEVELOPMENT AND ACCREDITATION OF TRAINING CENTERS

The NHC was established in accordance with the criteria of the AHA. ^{1,2,4} The same policy and procedures were maintained for any new center to be established. Furthermore, regular supervision by newly established faculty chosen according to a new criteria formulated by the SHA. These steps helped to maintain type, number and quality of CPR coursess (Table 1).

Once the above requirements are fulfilled, the center can be Accredited and begin to organise and conduct CPR courses. Supervision of the activities of any center is carried out by a faculty member especially for the first few courses.

Figure 1

Table 1: Basic and Advanced CPR courses conducted up to 2005

Type of course	Number of courses
I. BASIC LIFE SUPPORT COURSES	
Health Care Provider	370
Recertification	11
Basic Instructor	93
Heartsaver	75
TOTAL	569
II. ADVANCED CARDIAC LIFE SUPPORT	
Advanced Provider	142
Advanced instructor	48
Total - Advanced	190

RESULTS

Up to the end of 2005, the CPR Committee of the SHA was able to establish 90 Centers in the Kingdom. All can provide BLS courses and only 34 Centers can provide combined BLS and ACLS courses. These centers are widely distributed through different hospitals in the Kingdom of Saudi Arabia. The health care system is divided into three categories, mainly the M.O.H. which provides 60% of the health care in the Kingdom while the other 40% is shared by the private sector and other government hospitals. The total number of hospitals in the M.O.H. is 212. The private sector has 83 hospitals while the other government has only 39. The accredited training centers was increased in other government hospitals and, to a lesser extent in the private sector hospitals, while the the number of the M.O.H. hospitals is still low. In the early stages of development, the majority of courses were organized in Riyadh City at the NHC, but in the last decade more and more courses have been conducted outside of the capital, even the activities of CPR were extended to the Gulf states.

The essential requirements that needed to establish a accredited training center are:

1. Educational facilities such as lecture halls, four stations and audiovisual aids.
2. Mannequins for teaching basic and/or advanced cardiac life support courses.
3. several Instructors with valid certificates by SHA or AHA. Olnernative is to have a provider and/or instructor course either for BLS and/or ACLS is conducted by the SHA.
4. Handout material the SHA provides its own approved BLS and ACLS provider books also

The total number of certificates issued up to date exceeds 288,000. In the first 13 years the certificates issued was approximately 85,000 while the last 8 years has shown a tremendous increase in the certificates issued. The figure is rising year by year as shown in Table 2.

Figure 2

Table 2: The last 8 years annual certificates issued

Year	Figure
1998	19,520
1999	20,981
2000	24,407
2001	20,852
2002	23,798
2003	26,959
2004	28,270
2005	38,526
TOTAL	203,313

Figure 3

Table 3: 2005 Annual figures of certificates issued in Saudi Arabia and the Gulf Regions.

REGION	FIGURE
RIYADH	15502
WESTERN	9081
EASTERN	8754
NORTHERN	1642
MADINAH/AL-QASSIM	2296
SOUTHERN	725
GULF REGION	526
GRAND TOTAL	38526

The above table shows the 2005 annuals figures of various BLS and ACLS certificates which issued by different accredited training centers in the Kingdom of Saudi Arabia and the Gulf region. We are considered to be the second highest country after the U.S.A. that certifies medical personnel plus a limited number of citizens. The table also shows that Riyadh region still certifies more than 40 %.

Figure 4

Table 4: Achievements of various active Centres

Center	Certificates Issued
National Heart Centre	14525
KKUH	18969
KAUH	10078
Department of Anaesthesia	20253
ARAMCO	45596
Riyadh (KFSH & RC)	28283
Riyadh (KFNGH)	24399
Makkah (Ajyad Center)	18833
Al-Qassim Region	11820
Medinah (Al-Ansar Center)	9597
Jeddah (KFSH & RC)	8211
Jeddah (KKNHG)	8104
Military Hospital	7513
Riyadh (Al-Mashura)	1989
TOTAL	228170

The number of active Centers of BLS and ACLS in the Kingdom is 90. About 16 have ceased their activities. The majority were in the M.O.H. and some private institutions. This is mainly due to lack of human and financial support and dedication are the main reasons for the cessation of the activities of these Centers. Unless the MOH provides all the means to support CPR activities, the majority of medical personnel will not be certified, and eventually, the survival rate from cardiac arrest in their hospitals will be at a lower level than other hospitals. The figures in table 3 prove our point. Their active centers only certified 17% of the total figures of 2005 shown in that table.

Generally, these activities depend on dedication, enthusiasm, the number of instructors to organize and conduct courses with the possibilities of expanding, the administrative and financial support and finally the availability of other courses than CPR. Analysis of the activities of all Centers indicates that some Centers are more active than are others, such as the King Saud University, (National Heart Center, Department of Anaesthesia, College of Medicine, KKUH, and KKAUH), ARAMCO, King Faisal Specialist Hospital and Research Center, Riyadh (KFSH&RC), King Abdulaziz Medical City (National Guard), Riyadh, Makkah al-mukarramah training center, Al Qassim. region Al-ansar hospital medinah al-munawwarah, KFSH & RC. Jeddah, and KAMC (National Guard), Jeddah, military Hospital, Al-Mashura Health Skills Training Center respectively.

INSTRUCTOR CERTIFICATION

As the Saudi Heart Association is the sole body responsible to establish accredited CPR training centers in the Kingdom and. Recently extended its domain in this field to the Gulf region. This process is by organizing and conducting instructor courses, followed by supervision and finally accreditation of all these centers. The number of courses organized, conducted, and reported exceeded 260 for instructors in BCLS and ACLS. This resulted in certification of more than 1,000 instructors for BLS and more than 250 instructors for ACLS.

The majority of instructors were non-Saudi in the first decade, but recently we gained access to a good number of Saudi Instructors, particularly in basic, while the ACLS still has a limited and low number of Saudi instructors. The Saudi Heart Association board approved the recent recommendations to encourage more Saudi instructors to be accommodated as part of the faculty, selected members, CPR coordinators/Chairmen in their respective hospitals.

COMMUNITY CPR

Previously, CPR has not been publicized in the Islamic world. The community at large have not heard of it. Very few numbers of certificates have been issued in the community. This may be due to:

1. Lack of materials for CPR in Arabic or other languages such as Urdu, Hindi, Indonesian, Malay, etc.
2. Lack of heart association's in the Islamic countries which usually submit their requests to establish CPR activities and in accordance to the ILCOR and be affiliated with any of the major heart associations such as American, Canadian, British, etc.
3. Low key enthusiasm among individuals in respect of obtaining a valid CPR certificate.
4. Lack of enforcement of CPR certification by the health care delivery system or to allied personnel in these countries, (e.g., it is not included in the rules and regulations for having a valid driving license, employment in the security forces).

After the second Gulf War and the recent involvement of serious human tragedies which have been inflicted on the Kingdom and other countries by certain individuals or

groups of disaffected people. This has brought the plight of the lack of first responder, fire, police, and civil defence rescuers, and disaster management to the awareness of higher authorities in the land. In 1992 KFSH&RC managed to certify 300 candidates on Heartsaver. Another example is the Department of Anaesthesia, College of Medicine, managed to certify around 1500 lay persons during the last 20 years. These are two examples of the low-key attitude towards community CPR. Other centers may provide such activities, but the NHC is unaware of them. In the mid nineties the chairman of the national CPR committee attempted to establish citizen CPR in the 60 Centers recognized by the SHA.. The idea was put forward to each center to organize and conduct one citizen CPR (Heartsaver) course each week, for example, 40 weeks of each year. The idea was to certify around 20,000 citizens annually. In addition to the NHC, only one Center replied.

Major companies and individuals have shown an interest in enrolling their workers in Heartsaver and First Aid courses. The figure for this year statistics shows that 7,000 people were attending Heartsaver CPR and first aid courses. The SHA encouraged this idea through all centers to arrange and organize and conduct courses for the public at large in both languages. These courses for the community include personnel working in factories, companies, farms, banks, national scouts, etc. Furthermore, other government institutes are envisaged to have such training programs to be mandatory for all their workers. Living examples are the disabled centers, Al-Marai and the scuba diving organizations. Another living example is the idea which was furnished by the Chairman of the CPR committee to Saudi Arabian Airlines (Saudia). A mini symposium entitled "CPR in the Air," was organized and conducted. The mini-symposium highlights the critical analysis of different airlines' manuals of basic emergency care (First Aid and CPR), surveying stewardesses and cabin crew on the theoretical and practical applications in life-saving measures, actual CPR and the installation of AED. A recommendation was submitted advising the highest authority to develop a recognized training center in the Saudia facilities. After long and exhausting efforts a successful training program was established and recently deployment of AEDs in all Saudia planes and airports was achieved.

REASONS FOR FAILURE

The authors classified the reasons for failure into two important stages. They are:

STAGE I (1984 TO 2000)

1. Lack of official recognition of and enforcement of the mandatory CPR (BLS / ACLS) certificate to all healthcare providers in the Kingdom of Saudi Arabia and regular renewal every 3 years in accordance with the rules issued by the Saudi Council for health Specialties and Saudi Heart Association for obtaining license to practice in the Kingdom of Saudi Arabia.
2. Turnover of ex-patriots instructors and coordinators is high who initiate the CPR activities under the auspices of the Saudi Heart Association in their hospitals and/or regions. These activities are usually ceased once they leave without any replacement either from locals or ex-patriots. This is common to a greater extent in the M.O.H. hospitals and to a lesser extent in the private hospitals
3. Lack of financial and administrative support from to start and maintain the CPR activities.
4. Lack of enforcement of obtaining CPR certificates by the M.O.H. or private sector.

STAGE II: (2000- 2005). THE ERA OF SUCCESS

This stage is considered to be the golden era of the SHA, where the goals of expanding its activities were achieved within the Kingdom and even extended to the Gulf region. The following measures helped tremendously in reaching this level. They are:

INTERNATIONAL TRAINING ORGANIZATION (ITO):

This scheme was developed which allowed for the overseas organizations to be affiliated with the AHA. The first agreement was signed in 1999 between AHA and SHA indicating that the SHA is the sole body responsible for all CPR activities in the kingdom. A second agreement was signed in 2003. Recently the activities of the SHA extending into the Gulf region was recognized and blessed by the AHA. Over the past five years our figures have increased steadily and we are now the second highest after the USA. The total number of certificates issued is now over 200,000. In the first 15 years just over 85,000 certificates were issued while in the last five years alone over 125,000 have been issued. As new centers are established it is expected that activities will increased.

BOOKLET OF INFORMATION:

Early Production of rules and regulations “CPR in The Kingdom of Saudi Arabia” booklet (40 pages), establishment of centers rules for annual fees and other relevant matters. An updated version was issued in 2005 (140 pages)

REFORMING THE NATIONAL CPR COMMITTEE:

The reformation of the CPR National committee in 2000 was achieved. The committee members gathered from all regions of the Kingdom. These were the team who helped to provide and supervise the expansion of the services. Members of the committee are:

Figure 5

• Prof. M.A. Seraj	Chairman	S.H.A.	Riyadh
• Dr. Abdulmajeed Khan	Member	Ajyad H.	Makkah.
• Dr. Fared Al-Nozha,	Member	Al-Anssar H.	Medinah.
• Dr. Khalid Abu-Haimed	Member	Armco	Dhalran
• Dr. Hisham Al-Nadrah	Member	M.O.H.	Qaseem
• Dr. H. Yamani	Member	K.K.U.H.	Riyadh
• Dr. B. Al-Ghamdi	Member	Univ. Hosp.	Asseer
• Dr. Raed Hejazi	Member	N.G.H.	Riyadh
• Dr. A M. Kaki	Member	Coll. O. M.	Jeddah
• Dr. B Al-Sinan	Member	M.O.H.	Qateef

ARAMCO:

The recent affiliation of ARAMCO hospitals to the SHA and their mandatory requirement for private hospitals in the kingdom who wish to receive their patients must have CPR facilities and certified staff. This ruling was a blessing in disguise that majority of private hospitals requested the SHA to organise and conduct CPR courses and at the same time affiliated to SHA as CPR recognised training centers. After 2000 the number increased substantially from to .

MINISTRY OF HEALTH:

M.O.H. Recognition and requesting from all hospitals to have a center for training and required that those centers must be affiliated to and recognised by SHA. The M.O.H. recently started to require that all medical personnel working during the pilgrimage season must be holders of a valid certificate in CPR. This was followed with even better future plans to arrange to have an agreement with the SHA to certify 5000 various medical staff in BLS and 1000 physicians and critical care personnel in ACLS over one year. We hope that this endeavour will be extended to a larger number of their medical personnel.

GULF / ARAB RESUSCITATION COUNCIL:

One of the objectives of the National CPR Committee is to explore the idea of establishing an Arab or Gulf resuscitation council. Professors Takrouri and Seraj made the effort, using

the internet, and put forward a proposal to establish an Arab resuscitation council. This effort was not welcomed favourably by the Arab world within the medical personnel for the same reasons that have been mentioned earlier about the lack of enthusiasm within the medical individuals in the KSA. The same happened with the Gulf States as a group but our approach was successful with individual countries. The main reasons for being unsuccessful are, lack of finance to purchase the equipment, establish training center and purchase educational materials and affiliation with the SHA, etc. In this regard Dr. Khalid Abu Haimed and I presented a lecture on stages which the SHA went through for the past almost two decades, its financial budget and income and finally emphasizing the advantages of having such training centers that can and will produce regular activities based on the actual cost of establishing the training center and its requirement. The center will be able to retain all expenses and be self-supporting. Both presenters point out that long term plan will generate enough income and even produce a surplus to the establishment. This effort had a great impact and helped in Bahrain, Dubai, Oman and Yemen, etc. Several others neighbouring countries are considering to follow suit e.g. Kuwait, Pakistan.

FUTURE RECOMMENDATIONS

The SHA will succeed if it aims to answer all of the questions asked above. The following recommendations should be adopted for the next five to ten year plan. They are:

NATIONAL RECOGNITION OF CPR:

The need for CPR recognition by the whole society from the highest authority in the land to the public at large to be as part of our daily life. Accidents may happen in office, in school, at work or in the house. Accidents may involve babies, children, adults and elderly. Accidents may be classified into minor or a major or into man made or natural causes. They are considered to be part of our life which necessitate the creation of specific programme directed to all grades of the community.

HEALTH CARE PROFESSIONALS:

All students in Medical, Dental and Applied Health Science Colleges in other universities of the kingdom must implement the mandatory teaching of CPR and resuscitation in the curriculum. This mainly to bring their graduates in line with the graduates of King Saud University who introduce such teaching in the summer of the fourth year. Recently the department of anaesthesia hopes that the

academic department of the college of medicine will be able to have this course spread throughout the whole fifth. Furthermore, this will definitely will reduce the future burden of certification of these graduates by the existing training centers.

RED CRESCENT PERSONNEL:

Pre-hospital care and management of all illnesses, accidents and major disasters are provided mainly by the red crescent society. The manpower working in the establishment must be forearmed with the knowledge, skills and proper equipment to respond and apply the correct management anywhere at any time. The red crescent society must be affiliated to the SHA and have the training centers monitored and supervised by a team approved by the highest authority in health care delivery system in the Kingdom. Regular updating courses should be held beside the renewal of the CPR certificate. Paramedics and EMT training programs should include the approved SHA programs specifically designed for them.

SECURITY FORCES:

Officers and subofficers working in the following security forces e.g. Civil defense, fire Brigade, Traffic warden and Highway patrol should be trained, certified, equipped and authorized to provide life saving measures in where. They should be a holder of a certification in CPR, first aid and for the use of AED. This can be achieved by introducing such training in the curriculum of their colleges or institutes.

THE YOUTH WELFARE PRESIDENCY:

The high authority of youth welfare presidency should aim to install and expand on CPR and first aid training, and make it compulsory for all coaches, trainers and physiotherapists who are working in all sports facilities and provide and authorize senior staff to use the AEDs when it is necessary.

SAUDI ARABIAN AIRLINES (SAUDIA):

Recently Saudia joined the world compatriots in the service by introducing the AED on their planes and airports. This was upon the requirement of the Federal Aviation Administration (F.A.A.) how has issued a final rule requiring U.S.A. airlines to carry the AED and enhanced Emergency Medical Kits (EMKs) on all its domestic and international flights within three years. The aim is to provide the means to resuscitate and to deliver shocks to any cardiac victims in the airports by medical or paramedical personnel, and also in the air by designated, certified and authorized chief stewardesses.

THE MINISTRY OF EDUCATION:

should introduce CPR and first aid teaching of all high school students in a separate classes especially designed for the level of the students. These courses should be part of biology and science classes of the high schools.

SECURITY PERSONNEL:

Private establishments, banks, industrial areas etc.. should established compulsory training programme on first aid and CPR. The security personnel should be a holder of a valid certificate and authorised to provide life saving measures on site when they are encountered with any serious accidents.

DRIVING LICENCE:

All drivers must be training in special training center and to be a holder of a valid certificate in CPR and first aid as a compulsory requirement for obtaining or renewing their driver's license.

EDUCATIONAL AND PROMOTIONAL CAMPAIGN:

Regular campaigns on accidents, emergency conditions, traffic road accidents, cardiac diseases, heart attacks, etc. The campaign should aim to use all type of medias such as television, radio, newspapers and the internet. The new campaign should replace the old existing one-week campaign per year into longer and more frequent participation. In this respect health care delivery systems should aim to target the community that has prevalent diseases and should include the following points:

- Public education by organizing and conducting campaigns on Coronary Heart Diseases, hypertension, heart attack, cigarette smoking, First Aid and CPR etc..
- Collaborate arrangement with various associations with the know-how who can be of great help in such a task and can be organized and conducted in shopping malls, clubs, universities, schools, sport facilities etc
- The creation of an annual award of prizes by the SHA in different fields of CPR. The purpose of this annual ceremony would be to advertise the above achievements and create more public awareness about life saving.
- Establishment of a Gulf and/or Arab Resuscitation

Council. The aims are to unify methodology of teaching, resuscitation procedures in the Gulf States or the Arab world and to be represented in International Liaison for Committee on Resuscitation (ILCOR) among the world cardiac societies.

- Finally the SHA should aim to have a Royal approval for achievement in life saving and rescue, similar to the awards given in recognition of 10 times of blood and organ donation.

PUBLIC AT LARGE

The general public who are interested, either as individuals or groups affiliated to private clubs and institutions can get their wish for training fulfilled by contacting the National CPR training center of the Saudi Heart Association or their nearest affiliated CPR training center.

RESEARCH

Unfortunately, for the last 21 years the Saudi Heart Association did not provide natural budget for research into CPR in particular. Meanwhile, they did manage to gain government financial support for the study of cardiovascular diseases and its risk factors. There were only few researches, one on the use of LMA in cardiac arrest published in resuscitation, and recently 3 years study on pre-hospital and in-hospital CPR and its outcomes. The advice of the board is to encourage more and wider research in the activities of CPR.

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