

2022 FIFA WORLD CUP QATAR™

MEDICAL PREPARATIONS

– Written by Efraim B. Kramer, South Africa, Jiri Dvorak, Switzerland and Martin Botha, South Africa

When hosting the largest international football event, namely the 2022 FIFA World Cup Qatar™, it is taken for granted that the provision of medical services at the event will be of the highest currently available standard. How does any host country know, however, whether they have implemented this level of medical service prior to the commencement of a FIFA football tournament?

The simplest indication is the level of preparation undertaken to manage a sudden cardiac arrest (SCA) from recognition to rehabilitation. If the level of preparation for this type of incident is fully comprehensive, the goal has been achieved, as this is the most life-threatening of all medical emergencies and its complete management requires a fully integrated system comprising medical, educational, training², logistical, transportation, communication and security elements. If all of these elements are successfully integrated to deliver a seamless critical service, it can be concluded that all other less critical medical services are equivalently functional and efficient.

LINKS IN THE CHAIN

The comprehensive management of a SCA in a football player on the field-of-play (FoP) requires a number of mandatory links in the SCA survival chain. These links include the following 11 steps:

1. Realisation of the time-critical nature of a SCA
2. Requirements of personnel, equipment and medication
3. Rehearsal of the Emergency Medical Plan (EMP)
4. Recognition of a SCA
5. Immediate response onto the FoP
6. Resuscitation
7. Removal by road or rotary wing air ambulance
8. Revascularisation and/or reanimation
9. Rehabilitation and/or repatriation
10. Recount and recall briefings
11. Reassessment and rehearsal

1. Realisation of the time-critical nature of a SCA

A SCA is a time-critical medical emergency requiring immediate recognition and expeditious treatment if a

successful outcome is to be obtained³. The sooner external chest compressions can be initiated, and an automated external or manual defibrillator⁴ attached to the collapsed player's chest for analysis and defibrillation shock, if required, the greater the chances of a successful prognosis³. For this to occur effectively and efficiently, all links of the SCA survival chain have to be fully functional and integrated. Any weakness in this survival chain, particularly any element that may cause unnecessary delay, decreases the likelihood of a successful prognosis. There is no condition in medicine where the phrase: 'the sooner, the better', is more applicable.

2. Requirements of personnel, equipment and medication

Initial response to the side of a collapsed football player is routinely undertaken by one of the FoP medical teams positioned at the side line, usually on the outer side of each team bench. For the FoP medical team to respond effectively, each member of the team requires adequate emergency medical training and rehearsal, involving

specific items of medical equipment, which would include an appropriate player transport/transfer immobilisation device, an automated external defibrillator (AED) or equivalent and a FIFA Medical Emergency Bag (FMEB) or equivalent. The FMEB⁵, which was distributed by FIFA to all Member Associations in August 2013 and used successfully during the 2014 FIFA World Cup Brazil™, is an advanced life support-equipped emergency medicine bag that allows for the diagnosis and on-field management of a number of life-threatening medical emergencies. Adequate and appropriate staffing of the FoP medical teams, to ensure the competence and confidence of each member with regard to the necessary knowledge and skills for medical emergencies and equipment use, sets a standard of care for all football matches internationally. No FIFA football tournament should allow on-duty medical services that are functionally below this level of medical care; on the contrary, any on-duty medical provision which is above

this level of medical care should be fully supported and encouraged.

This means that the medical or paramedical qualifications of the FoP members are not the only concern in team member selection. It is just as important to establish whether they can competently function in the out-of-hospital environment. Recognition of, response to, resuscitation of and transfer from the FoP of a player who has suffered SCA has unique management features that require special consideration^{6,7} and medical management that differs from the standard International Liaison Committee on Resuscitation (ILCOR) international guidelines. Failure to appreciate these sport-related SCA considerations may adversely affect the player's eventual prognosis.

3. Rehearsal of the Emergency Medical Plan (EMP)

The SCA chain of survival is an integrated plan of action that requires constant rehearsal on the designated FoP, preferably

before each and every match by all members of the medical team^{2,5}. Recognition of a non-contact collapsed player must always be emphasised, the immediate response protocol must be fully understood, the on-site player assessment and resuscitation protocol must be practically rehearsed until all members are fully conversant and competent in its operation, including initial patient movements, effective external chest compression, AED use, advanced life support management, (when and if necessary), patient immobilisation and transfer protocols and transport to the medical facility, amongst others. Additionally, the FoP medical team leader must be appointed prior to the match and its related rehearsals so as to ensure an adequate chain of command and hence seamless clinical management.

4. Recognition of SCA – non-contact collapse

The majority of football player SCA incidents noted have involved a non-contact collapse of the player⁶. The recognition by

members of the FoP medical team must be immediate due to the time-critical nature of a SCA. This can only be achieved if the members of the medical team are actively observing the activities in their designated half of the pitch and not simply 'watching the game' as many are bound to do. This professionalism and discipline can determine the successful or unsuccessful prognosis of the SCA and is not to be treated lightly.

With an optimal time interval of 2 minutes (120 seconds) from non-contact collapse to first indicated AED shock⁸, the time-critical nature of the recognition, response and resuscitation links in the SCA survival chain are evident. The professional duties of the members of the FoP medical team are to observe for a player collapse, not the ball going into the net.

5. Immediate response onto the FoP

The critical nature of a SCA mandates that response to the side of the collapsed player be undertaken almost immediately post-collapse, with minimal delay. This means that the responsible medical team should not have to wait for the ball to be out of play for the referee to stop the match, run over to the collapsed player to assess the severity of the incident, summon the team's medical personnel onto the field and only then, summon the FoP medical team onto the field. To avoid loss of life in a SCA situation, the FoP medical team must respond immediately post-collapse.

Prior to the 2014 FIFA World Cup Brazil™, it was unanimously agreed between the FIFA medical and referee departments that should any player collapse with non-contact, the designated FoP medical team would respond immediately, without the referee's knowledge or sanction, if necessary. During this critical time response, three³ members of the medical team would respond to the side of the collapsed player with their emergency equipment, namely AED, FMEB and immobilisation device, while simultaneously, the remaining fourth member would rush over to the Fourth Official (referee) positioned next to the Match Commissioner's table, notify the referee that a player had collapsed, cardiac arrest was suspected and CPR was necessary, after which this fourth member of the FoP medical team would respond to the side of the collapsed player to join his/her team members. This new procedure in the event of a non-contact collapse of a player has become a standard of care and should henceforth be enacted, if and when necessary.

6. Resuscitation – ample, adequate, appropriate, advanced

Resuscitation of the football player in SCA must begin immediately after expeditious clinical assessment of the collapsed player. This assessment requires observation of the following signs⁶ in the collapsed athlete:

- Non-contact collapse.
- Non-responsiveness/unconsciousness.
- Normal or irregular breathing/apnoea.
- Slow myoclonic type seizure movements of the limbs.

Practically, any player who exhibits a non-contact collapse on the FoP and is discovered to be unresponsive/unconscious on arrival of the FoP medical team, is immediately diagnosed as a SCA and treated as such, unless proven otherwise. Due to the immediacy of the post-collapse response, it is possible that the collapsed SCA player may still be breathing when assessed and only within the next few minutes deteriorate into apnoea. Under no circumstances should the diagnosis of a SCA await cessation of breathing. Additionally, the presence of slow, myoclonic-type movements of the limbs post-collapse should **never** be diagnosed as a seizure^{9,10}, with institution of seizure management protocols. *In summary, any player who exhibits a non-contact collapse and is found to be unresponsive, is to be regarded as being in cardiac arrest, irrespective of whether there is breathing or not and irrespective of any seizure-type movements.*

Once SCA has been diagnosed, the player must be gently and carefully turned into the supine position, always taking care of the head and spine, which may be potentially injured when the player collapses¹¹.

When the player is adequately in a supine, horizontal position, external chest compressions should be started immediately in order to commence oxygenated blood flow to vital organs. Due to the physical exercise undertaken during the match prior to non-contact and the healthy haematological status of the player, the collapsed player can be regarded as having an adequate supply of oxygen within the circulatory system and hence hands-only chest compression¹² may be undertaken without concern, in line with ILCOR recommendations. This allows immediate, time-critical chest compressions to be initiated without having to be concerned about performing mouth-to-mouth rescue breaths and also allows sufficient time for airway and breathing aids and devices to be acquired, unpacked and safely used, for example; oropharyngeal, nasopharyngeal or laryngeal mask airways used in conjunction with manual resuscitators.

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Simultaneously with commencement of fast, effective external chest compressions, application and use of the on-site defibrillator should be undertaken, as per the rehearsed EMP.

It is only once effective external chest compressions are underway, with intermittent defibrillator analysis and recommended defibrillation shocks, that further advanced life support measures and procedures may be considered on the FoP.

7. Road or rotary wing air ambulance transfer

Whether the collapsed SCA player regains a return of spontaneous circulation (ROSC) or not, they will have to be transferred from the FoP to the nearest, most appropriate medical cardiac facility. Active resuscitation will depend on whether ROSC has been achieved or not.

In modern football stadiums, service tunnels leading to the pitch make it possible for an ambulance to be brought onto the FoP to the site of a collapsed player, rather than having to transfer them to an awaiting ambulance some distance away.

If the collapsed player has a consistent ROSC, the player should be clinically stabilised as well as is possible in this out-of-hospital environment, carefully placed and secured onto a spinal immobilisation device, with all attendant monitoring and therapeutic devices securely fastened and then transferred to the ambulance for transfer to the nearest, most appropriate medical cardiac facility for definitive post-resuscitation critical cardiac care.

If the collapsed SCA player does not have a ROSC after available resuscitative measures have been undertaken, the player should likewise be transferred to the nearest cardiac facility for further care. For this transfer to be undertaken effectively and efficiently, external chest compressions should never cease for any period in excess of 10 seconds from FoP to medical facility⁸. This may be achieved by making use of an automated external chest compression device such as the Zoll AutoPulse™ or alternatively, requires continued, disciplined manual chest compressions, by alternating providers, from the FoP to the medical facility. Whichever mode of chest compression is used during transfer, practical training and regular rehearsals are

mandatory to help ensure that the transport to hospital will be successful.

The duration of the critical care transfer from FoP to the medical facility should not be longer than 10 minutes. Therefore, if this additional time-critical period cannot be achieved by ambulance with the co-operation of the relevant traffic and security services in attendance, then transfer by helicopter must be considered as part of the EMP, with its entire attendant logistical, regulatory, safety and clinical considerations ensured.

8. Revascularisation and/or reanimation medical cardiac facility

As stated above, every collapsed SCA player, whether he/she regains a ROSC or not, will be transferred from the FoP to the nearest, most appropriate medical cardiac facility. To be 'most appropriate', the designated receiving facility should have a level of cardiac care that is amongst the best available internationally, having comprehensive cardiac critical care facilities with related diagnostic, laboratory and therapeutic services, including on-site/nearby interventional cardiac catheterisation services, cardiothoracic

surgical facilities and be fully operational 24 hours daily during the tournament.

The designated receiving facility should also have the capability to receive SCA patients, (with or without ROSC), arriving at the facility by road ambulance or helicopter, to ensure there are no unnecessary critical delays from FoP to definitive treatment modalities.

9. Rehabilitation and/or repatriation

Once a player who has suffered SCA has been successfully resuscitated either on the FoP or at a medical facility nearby and is recovering in a critical care unit, it becomes imperative to consider a programme of initial rehabilitation, both psychological and physical, as this event with all its consequences, is practically a career-ending incident. Additionally, it is important to plan for the player's repatriation home under strict aeromedical conditions that will provide whatever medical or logistical support is necessary, whether this be undertaken via fixed wing air ambulance transfer, medical escort via commercial carrier or under the supervision of the team physician with the team when they depart for home.

10. Recount and recall briefings

The resuscitation of an international football player on the FoP, with all of its attendant actions and procedures, witnessed not only by thousands of spectators present in the stadium and the ever-present recording media, but also by millions worldwide via television coverage, may have unknown psychological consequences on the entire group of medical personnel who were involved in the SCA incident. Criticism related to recognition, response, resuscitation, removal and other non-medical aspects of the entire SCA incident is always present, both domestically and internationally, by medical colleagues whose only information of the incident may come from the selected television footage witnessed, which may often be practically out-of-context.

It is therefore mandatory that adequate post-incident debriefing and appropriate counselling sessions be integrated into the EMP and be held if and when necessary. These sessions are vital whether the eventual result of the SCA is positive or otherwise.

11. Reassessment and rehearsal

Once adequate and comprehensive post-SCA debriefings have been undertaken, it will become abundantly clear which aspects of the EMP went according to plan, which aspects did not and which aspects require modification. Once these corrections have been incorporated into the revised EMP, regular rehearsals become, once again, mandatory, not only to familiarise all FoP team members and related and associated medical personnel with the revised EMP, but to prepare them all for future possible SCA events.

CONCLUSION

If every link in the described SCA survival chain is in place, effective and efficient as required, in sequence and interlinked as necessary, with no weakness in any link to undermine the integrity of the chain, for this most critical of all life-threatening medical emergencies, then it can be stated that the medical services are ready and prepared for all eventualities involving single-patient medical emergencies¹³. Simply stated, if one is fully prepared to

manage a SCA on the FoP, then one can manage any other medical emergency, of whatever nature.

For the Game, For the World.

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Efraim B Kramer M.D., M.Sc.Med.
Professor, Sports Medicine
Faculty of Health Sciences
University of Pretoria
Pretoria, South Africa.

Jiri Dvorak M.D.
FIFA Chief Medical Officer
F-MARC Chairman

Senior Consultant, Neurology
Schulthess Clinic
Zurich, Switzerland

Martin Botha M.Sc.Med.
Lecturer, Emergency Medicine
University of Witwatersrand,
Johannesburg
Johannesburg, South Africa

Contact: efraim.kramer@up.ac.za