



## EMS Potentials in MENA region

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Emergency Medical Services (EMS) are critical services provided by Red Cross and Red Crescent (RCRC) national societies, especially in the Middle East and North Africa (MENA) region, during both emergency and non-emergency situations. During COVID-19, these societies expanded their EMS capabilities to support overwhelmed healthcare systems.

A survey tool was developed by the IFRC MENA health team to assess the EMS capacities and identify areas for improvement. The survey included 67 questions across five domains: governance and dispatch, human resources and logistics, EMS education, EMS operation and quality, and EMS disaster preparedness. It was piloted with Lebanese Red Cross and sent to EMS managements of the Lebanese Red Cross (LRC), Palestine Red Crescent Society (PRCS), Saudi Red Crescent Authority (SRCA), and Syrian Arab Red Crescent (SARC) between April and August 2022. Data was collected via SurveyMonkey and validated through workshops and interviews.

### Key findings include:

**EMS Governance and Dispatch:** All societies use a “scoop and run” model, with varying degrees of dispatch automation. SRCA, PRCS (West Bank), and LRC (central) use fully automated systems, while others use semi-automated or manual systems.

**Human Resources and Logistics:** LRC, PRCS, and SARC rely on volunteers, whereas SRCA employs 6,000 full-time staff. SRCA has the largest EMS fleet with 1,400 vehicles, followed by LRC (390), PRCS (180), and SARC (112).

**EMS Education:** LRC and SRCA offer internationally accredited emergency courses (ATLS, BLS and PHTLS), while PRCS and SARC provide locally tailored training.

**EMS Operation and Quality:** Urban service coverage is high (80-100%), but rural coverage is below 50% in some areas. Quality assurance and regular monitoring are areas that need to be standardized and systematized.

**EMS Disaster Preparedness:** LRC, PRCS, and SRCA conduct specialized training for mass casualty incidents, and have standardized major incident management protocols.

Overall, the survey highlighted variations in EMS governance, resources, education, operations, and disaster preparedness among the national societies.



## The Obstacles that Face Emergency Medical Services System when Dealing with Critical Care Cases in Saudi Arabia

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### Background:

The Emergency Medical Services System (EMS) is the first system that responds to people who need immediate emergency care. In prehospital, EMS providers deal with various cases. This study focuses on the challenges and weaknesses of the EMS system in dealing with life-threatening critical issues to identify and compare the obstacles that affect the outcomes of the EMS system when exposed to critical care cases by measuring these aspects: patient care, workforce, policy, education, and equipment.

### Methods:

In this research, the sampling technique was random sampling technique. The study setting is the Saudi Red Crescent Authority in Saudi Arabia. The inclusion criteria include field paramedics and emergency medical technicians (EMT) in the Saudi Red Crescent Authority. The sample size is 385.

The researchers gathered data by using an online questionnaire. The data were analyzed using SPSS Inc. Categorical data were presented as frequencies and percentages.

### Results:

In total of 674, the results were that most of the respondents fell within the 31–40 age range (61.4%). The majority of respondents were EMTs (83.7%). The study revealed that 80% of respondents responded to over 20 critical cases. The majority of females were in the central area. Paramedic specialists were more likely to work with critical case in western area. Although, 69.1% believing four members were satisfactory. The older respondents had the highest proportion (54.5%) of those who believed that two squad members were enough to handle one critical case. Additionally, 80.7% reported shortages of tools or drugs, with drugs being the most commonly missing material (45.7%). 77.5% agree to change the policy to enhance their dealings with critical cases.

The study found the participants agreed that they need more practice to deal with critical cases, with a percentage of 62.2%. Also, 74.3% believe the curriculum needs adjustment.

### Conclusion:

To sum up, to improve patient outcomes, the Saudi EMS system requires updated protocols, further training sessions, and better workforce distribution. A multifaceted strategy is required to address these issues, including better resource management, gender diversity, and the balance of regional resources.



## Early Diagnosis of Upper Extremity Deep Venous Thrombosis Using Emergency Department Point-of-Care Ultrasound: A Case Report

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### Background:

Upper extremity deep vein thrombosis (UEDVT) is a serious condition associated with fatal complications. It necessitates careful consideration and prompt intervention. Despite the proven effectiveness of point-of-care ultrasonography (POCUS) in detecting UEDVT, it is rarely utilized in the Emergency Department (ED). Purpose: To highlight the role of POCUS in the early diagnosis of UEDVT in the ED.

### Case Summary:

A 65-year-old female, actively undergoing chemotherapy via a right subcutaneous port for known left breast cancer, presented to the ED exhibiting throat irritation, facial swelling, and itchiness. These symptoms surfaced the day after her latest chemotherapy session. She typically experienced similar reactions post-chemotherapy, managed by routine oral antihistamines and steroids, yet this instance persisted despite medication. On examination, she appeared flushed, with a plethoric and erythematous face, accompanied by swelling extending from her neck to the left arm, along with tender left axillary lymph nodes. A POCUS of the left upper arm revealed soft tissue edema, a non-compressible brachial vein, and a hypoechoic floating luminal lesion (Figure 1). Subsequent computed tomography (CT) confirmed upper limb deep venous thrombosis extending into the left subclavian and internal jugular vein, partially non-occlusive in the proximal superior vena cava. Notably, she had a known contrast allergy, requiring pre-treatment with steroid and diphenhydramine before contrast injection. Based on CT findings, therapeutic enoxaparin was initiated in the ED and patient was admitted under oncology care, subsequently discharged on rivaroxaban. Discussion: Based on previous studies, the reliance on radiologists; availability for vascular imaging to diagnose UEDVT within the ED led to significant delays, extending up to two hours. Notably, the utilization of POCUS by Emergency Physicians resulted in a marked reduction in both diagnosis and intervention times.

Furthermore, insights from six prospective studies confirm the accuracy of color-Doppler sonographic imaging in diagnosing UEDVT, showcasing sensitivity ranging between 78% to 100% and specificity from 82% to 100%. This compelling evidence strongly advocates for the broader integration of POCUS in EDs, emphasizing its credibility in enhancing diagnostic accuracy and expediting timely intervention for UEDVT. Applying these findings to this specific patient case, reliance on POCUS could have avoided the risks associated with radiation and contrast exposure. Conclusion: Integrating POCUS into the ED diagnostic protocol for UEDVT enables early detection and intervention, and mitigates risks associated with contrast agents and excessive radiation exposure.



## EMS during disaster: A case study on Syria Arab Red Crescent (SARC) EMS response during February 2023 earthquake

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### Background:

- On February 6, 2023, an earthquake measuring 7.8 magnitudes struck southern Turkey near the border with Syria; nine hours later, another earthquake measuring 7.5 magnitudes hit the same region.
- The earthquakes led to enormous losses in Aleppo, Latakia, Hama, and Idlib; 200,000 people were made homeless in Aleppo, over 7,000 deaths and 10,400 injuries and 6 million affected in total.
- The Syrian Arab Red Crescent (SARC), the main humanitarian organization in Syria, continued its emergency services despite the destruction.

### Methods:

Case study on the SARC EMS response through:

- Document review: SARC operations plan, progress review reports, situation reports, lesson learned report.
- Key informant interviews: SARC EMS management and response team.

### Description:

- SARC EMS started receiving initial calls at 4:20 a.m. on February 6, responding by dispatching 22 ambulances within 10 minutes to affected areas.
- Initial efforts were hampered by destruction and the lack of search and rescue equipment.
- Ambulances supports were mobilized from neighbouring regions.
- In the first week, SARC EMS responded to 406 disaster-related requests. By the end of the first month, they provided their services to 1,034 beneficiaries, transferred 1,013 injured patients, and handled 254 dead bodies.
- Four months post-earthquake, SARC EMS attended to 5,029 cases; 2,387 were transferred with injuries, and 2,388 were treated on-site.
- SARC performed community first aid training and EMS volunteer training.

Recommendations from the Lessons Learned Workshop:

1. Invest in better preparedness for EMS to support disaster response better.
2. Prioritize mitigation measures to overcome EMS's ongoing challenges, such as fuel and staff shortages.
3. Advocate for the exemption of the humanitarian efforts from any sanctions.
4. Develop and practice an EMS contingency plan.
5. Coordinate EMS response with other emergency agencies early in the operation.

### Conclusion:

SARC EMS has played a vital role in disaster management for over 12 years, including this latest earthquake response. Despite several constraints, such as fuel shortages and equipment unavailability, SARC EMS successfully had met the increased needs during and after the earthquake.





## The Necessity of Point-Of-Care Ultrasound in Saudi Arabia Ambulances.

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The use of point-of-care ultrasound in ambulances has recently gained attention as a valuable tool for enhancing patient care and diagnostic accuracy. This study aims to investigate the necessity of implementing point-of-care ultrasound in Saudi Arabia's ambulance services it worth to mentioning, there is no ultrasound in the pre-hospital services in Saudi Arabia.

The findings of the study will provide important insights into the potential benefits of using point-of-care ultrasound in Saudi Arabia's ambulance services and inform policymakers' decision-making. It is expected that results will also contribute to the broader adoption of point-of-care ultrasound in emergency medical care in other countries The research aims to anticipate the necessity of point of care ultrasound in Saudi's ambulance. The research was conducted retrospectively by collecting two separate sources of secondary data of 399 patients records. One is from the emergency medical services department of Royal Commission Health Services in Jubail (RCH). The second source is from RCH's hospital only from emergency department (ER). The study found that using ultrasound in prehospital patients has both diagnostic and therapeutic applications, and there is statistical significance to support its use.

The applicability of point-of-care ultrasound (POCUS) varied depending on the type of call. Additionally, there was a correlation between the use of ultrasound and the ability to develop a suspected diagnosis in prehospital care. The data analysis also revealed that there was a variation in ultrasound test findings in the ER, with 100 out of 228 patients (43.86%) needing FAST conducted there instead of on the ambulance en route to the hospital. Out of the 106 cases (46.49%) with positive ultrasound findings, this information could be shared by paramedics to prepare the hospital for incoming patients and help reduce delays in patient care. We conclude the ultrasound is demand in the pre-hospital service of Saudi Arabia.





## Safety measures of Emergency Medical Service (EMS) during COVID-19 pandemic in Riyadh, Saudi Arabia

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### Background:

The global outbreak of COVID-19 has presented unparalleled difficulties to healthcare systems across the globe, necessitating a comprehensive approach to contain the transmission of the virus and safeguard healthcare personnel working on the frontlines. Notably, Emergency Medical Services (EMS) personnel are a vital component of the general workforce, as they are responsible for administering pre-hospital care and facilitating patient transportation. This study, therefore, aimed to evaluate the level of awareness among EMS personnel in Saudi Arabia concerning COVID-19 prevention approaches and resources, as well as to point out potential areas for improvement.

### Methods:

This study utilized a cross-sectional research design to evaluate the level of awareness regarding COVID-19 prevention strategies and resources among EMS personnel in Riyadh, Saudi Arabia in the period from January 2023 to June 2023. The research sample comprised EMS personnel operating in diverse regions of Riyadh, Saudi Arabia. The inclusion criteria for this study involved EMS personnel who have been directly engaged in pre-hospital care amidst the COVID-19 outbreak. Besides, the study did not impose any particular exclusion criteria for individuals who wish to participate. Ethical approval was obtained from King Abdullah International Medical Research Center (KAIMARC).

### Results:

A total of 98 participants agreed and completed the survey. Most of the participants were males (94.9%) and most of them aged 20-29 (65.7%). The results revealed that 55% of EMS personnel reported acquiring COVID-19 while serving as paramedics. Among those who contracted the disease, 32% admitted to not using their Personal Protective Equipment (PPE) as directed. In terms of resource availability, 45% of the respondents reported that they always have available PPE for them during the pandemic. Furthermore, 56% of the participants reported limitations of medical supplies during the pandemic. Most participants reported moderate level of satisfaction about the applied protocols at their workplace with regards to protocol comprehensiveness to protect against COVID-19, clarity, and ease of application.

### Conclusion:

This study highlighted the pressing necessity for improved COVID-19 prevention measures and resources for EMS personnel. It also provided valuable insights that can be used to design evidence-based interventions for improving COVID-19 prevention strategies and ensuring an adequate supply of PPE and implementation of clear and effective protocols.





## Patterns of carbon monoxide poisoning and its association with delayed neuropsychiatric sequela at a tertiary hospital in Riyadh, Saudi Arabia.

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### Background:

Carbon Monoxide (CO) is one of the most common environmental causes of acute intoxication globally. It occurs due to impaired tissue oxygenation which has a detrimental impact on systems with high oxygen demands such as cardiovascular and neurological systems. It can lead to Delayed Neuropsychiatric Sequelae (DNS) which may develop in 2-40 days after remission of acute CO poisoning. DNS is defined by recurrent-transient neurological, cognitive, or psychological manifestations. This study intended to explore the development of DNS for patients exposed to CO intoxication in Saudi Arabia.

### Methods:

A retrospective descriptive cross-sectional study conducted in subjects who were diagnosed with CO poisoning at King Abdulaziz Medical City (KAMC) and King Abdullah Specialist Children's Hospital (KASCH) in Riyadh during the period from January 2016-December 2021. Patient demographics, vitals, diagnostic tests, and oxygen therapy at initial presentation documented. Patient records were reviewed at 2-40 days following CO poisoning for development of DNS. The type of DNS and the onset were documented. Ethical approval obtained from King Abdullah International Medical Research Center (KAIMARC).

### Results:

A total of 85 patients diagnosed with CO poisoning and met the inclusion criteria. 76% adults with an average age of 32.36 (SD± 15.20) and 51% were males. The majority of the incidents occurred in winter season (76%), especially in enclosed spaces (84%). 25% of the patients were smokers. Only 5 (6%) of patients developed DNS. Common symptoms included dizziness, nausea, and decreased visual acuity in 40% of cases. (80%) of DNS manifestations occurred at 2-10 days after initial incident. Statistics showed that BMI (p-value = 0.021) and age (p-value = 0.029) were significantly associated with COHb level. Furthermore, there was no statistically significant association between gender, age, BMI, type of exposure, presence of clinical manifestations, and COHb level with the development of DNS. Only one reported death in this study.

### Conclusion:

The findings of this study showed that few patients who were exposed to CO poisoning have developed DNS. BMI and age group were significantly associated with COHb level. Further larger-scale multicenter studies are needed to assess the factors associated with the development of DNS for patients with CO poisoning.

