Medical Emergency Response Plan: Case Study in a Mining Company

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Abstract. Medical emergency condition can occur unexpected and caused by human factors or unsafe actions. Mining companies need to have a system for handling medical emergencies that can be caused by physical, chemical, biological or other forms of danger. Lack of medical emergency response plan led to delay in evacuation and risking more lives to the hazards and harmed.The research uses a qualitative research design with a case study approach. The research was conducted at PRN Mining Company. Data collection was carried out using observation techniques, interviews and documentation studies of company regulations. Data collection and analysis was carried out using a focus group discussion method involving 9 people with proportional representation from HSE management elements, company doctors and practitioners in the field of occupational medicine. The research was conducted in the period January – April 2023. A medical emergency response plan is a set of written procedures that guide emergency actions, facilitate recovery efforts, and reduce the impact of emergency events. In mass medical emergencies, triage is an effort to sort and determine priorities for medical emergency response actions based on treatment needs and availability of resources. This mining company use the Simple Triage And Rapid Treatment (START) method for triage system. The work environment must be maintained in a safe condition for workers by implementing hierarchical control. The company needs to prepare policies and standard operational procedures for handling medical emergencies and prevent worsening of medical emergencies. The medical emergency response plan requires regular monitoring and evaluation to make adjustments based on company needs and scientific developments.

Keywords: *Medical, Emergency, Occupation, Mining.*

Abstrak. Kondisi darurat medis dapat terjadi secara tidak terduga dan disebabkan oleh faktor manusia atau tindakan yang tidak aman. Perusahaan pertambangan perlu memiliki sistem penanganan darurat medis yang dapat disebabkan oleh bahaya fisik, kimia, biologi atau bentuk bahaya lainnya. Kurangnya rencana tanggap darurat medis menyebabkan tertundanya evakuasi dan mempertaruhkan lebih banyak nyawa dalam bahaya dan korban jiwa. Penelitian ini menggunakan desain penelitian kualitatif dengan pendekatan studi kasus. Penelitian ini dilakukan pada Perusahaan Pertambangan PRN. Pengumpulan data dilakukan dengan teknik observasi, wawancara dan studi dokumentasi terhadap peraturan perusahaan. Pengumpulan dan analisis data dilakukan dengan metode diskusi kelompok terfokus yang melibatkan 9 orang dengan keterwakilan proporsional dari unsur manajemen HSE, dokter perusahaan dan praktisi di bidang kedokteran kerja. Penelitian dilakukan pada periode Januari – April 2023. Rencana tanggap darurat medis adalah serangkaian prosedur tertulis yang memandu tindakan darurat, memfasilitasi upaya pemulihan, dan mengurangi dampak kejadian darurat. Dalam kedaruratan medis massal, triage merupakan upaya memilah dan menentukan prioritas tindakan tanggap darurat medis berdasarkan kebutuhan pengobatan dan ketersediaan sumber daya. Perusahaan pertambangan ini menggunakan metode Simple Triage And Rapid Treatment (START) untuk sistem triage. Lingkungan kerja harus dijaga dalam kondisi aman bagi pekerja dengan menerapkan pengendalian hierarki. Perusahaan perlu menyiapkan kebijakan dan standar prosedur operasional untuk penanganan kedaruratan medis dan mencegah memburuknya kedaruratan medis. Rencana tanggap darurat medis memerlukan pemantauan dan evaluasi secara berkala untuk melakukan penyesuaian berdasarkan kebutuhan perusahaan dan perkembangan ilmu pengetahuan.

Kata Kunci: *Kedokteran, Kegawatdaruratan, Pekerjaan, Pertambangan*.

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A. Introduction

Medical emergency condition can occur unexpected and caused by human factors or unsafe actions (1). Medical emergencies can cause losses for both workers and the company. Incurring medical treatment costs which can be greater if medical emergencies are not treated immediately (2). A medical emergency can be defined as a dangerous, unexpected and serious situation related to the worker's health condition that requires appropriate treatment. Work place emergency refers to the event that occurs and endangers the people in and around the workplace and risks disrupting the operations by causing damage (3)(4).

Mining companies are one type of company that needs to have a good system for handling medical emergencies (5). This is based on the fact that mining companies usually carry out their business activities in areas that are not close to residential areas, so it takes time to access advanced health services.

Mining companies need to have a system for handling medical emergencies that can be caused by physical, chemical, biological or other forms of danger (6)(7). Lack of medical emergency response plan led to delay in evacuation and risking more lives to the hazards and harmed (8). In complex conditions such as the presence of high levels of dangerous infectious diseases, special evacuation is sometimes required (9).

B. Method

The research uses a qualitative research design with a case study approach. The research was conducted at PRN Mining Company. Data collection was carried out using observation techniques, interviews and documentation studies of company regulations. Data collection and analysis was carried out using a focus group discussion method involving 9 people with proportional representation from HSE management elements, company doctors and practitioners in the field of occupational medicine. The focus group discussion was carried out in 3 stages, including discussion of identifying medical emergency risks, discussion of efforts to control medical emergency risks, and preparation of medical emergency response plan guidelines. The research was conducted in the period January – April 2023.

C. Result and Discussion

Medical Emergency Risk Identification

Medical emergencies in mining companies can occur due to various things, both internal and external factors of workers. Internal factors include disease history, treatment history, etc. Meanwhile, external factors can include work environments that have biological, chemical, physical, ergonomic and psychosocial hazards. Medical emergencies can be at different levels. So the treatment carried out must be in accordance with the medical emergency conditions that occur.

Based on the need for further treatment, medical emergencies in mining companies can be classified as follows:

1. Emergency Medevac: Medical Evacuation of sick or injured person(s) requiring immediate medica attention at a hospital for which disembarkation is done using dedicated non-scheduled flight, marine or land transport;
2. Non-emergency Medevac: Medical Evacuation of sick or injured person(s) requiring immediate medical attention at a hospital/clinic for which disembarkation is done using next available scheduled or diverted flight, marine or land transport; and
3. Referral cases: referring sick or injured person(s) requiring medical attention at a hospital/clinic at the end of tour duty.

Medical Emergency Risk Control

A Hierarchy of Controls provides a means of determining ways to implement systems or controls (from most effective to least effective) that protect workers from injuries, illnesses, and fatalities. As identified in the graphic, the primary exposure control methods are hazard elimination or substitution by a less hazardous process or toxic substance. Workplaces should systematically implement exposure controls in the following order of effectiveness:

Elimination, Substitution, Engineering Controls, Administrative Controls, and Personal Protective Equipment (PPE). It is hoped that all these efforts will be able to prevent the occurrence of medical emergencies in mining companies. Readiness in handling medical emergencies must be supported by policies with standard operational procedures.

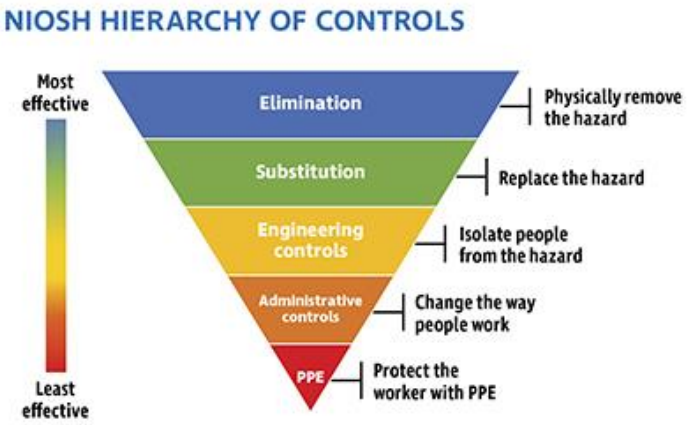

Figure 1. NIOSH Hierarchy of Controls

Source: National Institute for Occupational Safety and Health (NIOSH), 2021

Administrative control, which includes policies and standard procedures in handling medical emergencies, is considered the most effective effort to avoid worsening medical emergencies that may occur. Assembling a team consisting of trained personnel, preparing procedures for implementing emergency responses, including providing supporting facilities by the company are the keys to successful control of medical emergency risks.

Medical Emergency Response Plan

A medical emergency response plan is a set of written procedures that guide emergency actions, facilitate recovery efforts, and reduce the impact of emergency events. Implementing a medical evacuation response plan requires resource support such as effective communication equipment (telephone, radio, computer and fax). First responders and trained health professionals (doctors and health workers), adequate means of transportation (land route using ambulance to the nearest hospital, water route using boat to shore base, and air route using helicopter to the airport). All personel's on board shall go along wih doctor and injured person and/or illness patient to go to on shore if doctor onboard shall escort the injured person and/or patient. This term and condition applicable only during unavaliable chopper due to certain conditions. The company establishes a complete medical structure (primary, secondary, and tertiary health-care units).

In its entirety, a medical emergency response plan flow is prepared where each team member involved in handling emergency conditions can understand the applicable procedures. The medical emergency response plan flow is as follows:

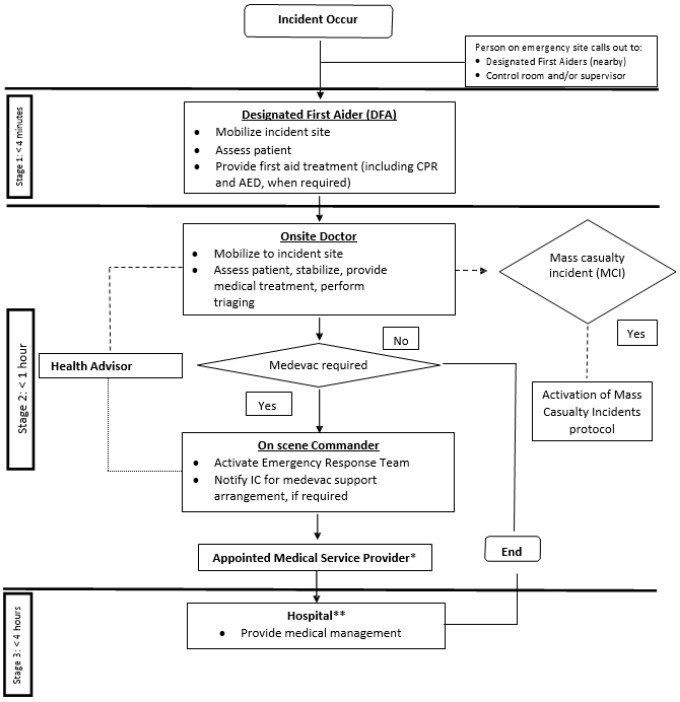

Figure 2. Medical Emergency Response Plan Flow Chart

In mass medical emergencies, triage efforts need to be carried out. Triage is an effort to sort and determine priorities for medical emergency response actions based on treatment needs and availability of resources. Triage shall be applied in the communication of all medical emergencies and the prioritization of incidents involving multiple casualties. Triage can be performed quickly by assessing ability to walk and talk, airway, breathing and respiratory rate, and circulation (including pulse and blood pressure). The main action of triage are rapidly identify patients with urgent life threatening conditions, determine the most appropriate treatment area to transfer the patient, and provide on-going assesment and review triage labels as situation dictate. Based on the results of the focus group discussion, this mining company is still using the Simple Triage And Rapid Treatment (START) method. The following is the flow of triage in the company:

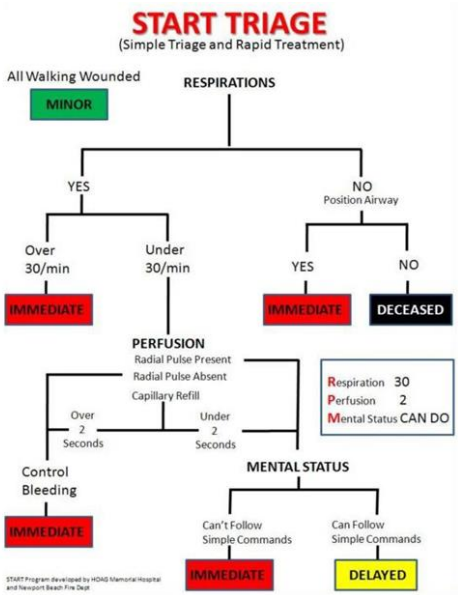

Figure 3. Simple Triage and Rapid Treatment (START) Flow Chart

Policies and standard operational procedures regarding medical emergency response plans are evaluated periodically to be updated in accordance with regulations, guidelines and developments in science. This evaluation was carried out by a team consisting of HSE management staff, company doctors and experts in the field of occupational medicine.

D. Conclusion

Based on the discussion in this research, several research results were concluded as follows:

1. A medical emergency is a condition that can occur at any time and can be influenced by internal and external factors of the worker.
2. The work environment must be maintained in a safe condition for workers by implementing hierarchical control over various hazards that exist in the company.
3. The company needs to prepare policies and standard operational procedures for handling medical emergencies as an effort to handle medical emergencies and prevent worsening of medical emergencies.
4. The implementation of the medical emergency response plan requires regular monitoring and evaluation to make adjustments based on company needs and scientific developments.

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