

## A “do-it-yourself” resuscitation trolley for better patient care

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Cardiac arrest, anaphylaxis, hypovolaemic shock-burns, bleeding, and multiple injuries comprise some of the commonest emergencies in our wards. Timely resuscitation often prevents progression to irreversible shock and death. Even in the best centres, resuscitation of this nature is a challenge.

Protocols such as Advanced Trauma Life Support and Advanced Cardiac Life Support have been published to further refine resuscitation and make resuscitation globally uniform. In Sri Lanka, the medical and paramedical profession can avail themselves of training programmes made available at hospital level and national level, to train in emergency care.

Other than knowledge and skill, other factors which determine the outcome in an emergency are the equipment and facilities which are needed for proper resuscitation; in case of an emergency in the ward, at most times, there is difficulty in getting the instruments organized for resuscitation. This may be due to several reasons:

1. Improper placement of instruments in the ward – requiring many people to be involved in locating and moving the instruments/equipment instead of being involved in managing the emergency patient. Some essential equipment may need to be obtained from other sites such as the theatre and other wards which delays the process unnecessarily and creates “helplessness” among emergency medical staff.
2. When instruments such as multi-parameter monitors, defibrillators and suckers are brought to the scene, it becomes difficult to place them in both a convenient and strategic position in the care of patients – the usual practice has been to place them on bedside lockers which also have

the patient's personal property. These lockers have to be cleared first to make room for resuscitation equipment! All of this considerably delays timely intervention in the resuscitation process.

3. At other times, electrical outlets (plug points) either malfunction or are situated far away from the resuscitation area in the ward - in most instances power extension cords are needed, which are not exclusively purpose specific, and may be in a state of disrepair.

We developed the resuscitation desk at our hospital to overcome these difficulties. The main idea was to place all necessary items required in an emergency in one portable unit.

The trolley was made of discarded objects found mostly in the hospital stores. Incidentally, we observed that, many discarded instruments could be used with minor adjustments. The equipment we used on the trolley included a discarded multi-parameter monitor, a light source, a defibrillator and suction apparatus.

The resuscitation trolley comprised of electrical equipment, mounted on a small trolley, which could be moved in the ward freely and which also had the monitor, a defibrillator, nebulizer, suction apparatus and a light source. We used power from an uninterruptible power supply unit (UPS) which has a long power cable enabling connection to a remote wall electrical outlet in the ward. The electrical connections and wiring for each of these components of the trolley had been arranged inside the trolley, with each item connected to the UPS. Separate labeled switches for each of the instruments on the side wall of the trolley indicated the equipment to be operated without touching the actual instrument. With the help of the UPS all appliances could be operated in an instant for about 15 minutes until a wall power outlet could be accessed.

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This method also ensures safety of use and preserves the shelf life of the equipment on the trolley by avoidance of power fluctuations. Furthermore, electrical instruments which require fine handling and, therefore damaged by rough handling by untrained individuals, could be better cared for by individuals dedicated to the care of the resuscitation trolley. It was apparent that some of the discarded instruments we revived were damaged by poor handling. Also, we did not need to manipulate the instruments individually since all switches were in one convenient place which made operation easy.

Yet another factor which presented difficulty was storage, where ward staff had to retrieve necessary items from cupboards in an emergency. Invariably, this causes delay in patient management. For convenience and ease of retrieval, the resuscitation trolley is equipped with ample storing capacity, with an area for items such as infusion fluids, rolls of plaster, another for smaller, fine items such as needles, and yet another area for airway equipment such as an Ambu bag and a laryngoscope.

Our resuscitation desk is equipped with an in-built emergency tray and a drawer just below it for waste to be stored safely without interfering with work. This ensures that the drug preparation area could be kept clean and well organized which helps minimize error. Previously, an emergency tray, usually a separate trolley, had to be taken to the scene of resuscitation. Now, as there is no necessity for another trolley, the limited space in the ward could be used freely in an

emergency situation.

Adequate lighting has been a problem in case of a necessity for surgical procedures in the ward. The usual solution has been a torch, held by an assistant, which often does not fulfill its purpose. Our trolley is equipped with an in-built light source which is operated through UPS power. Procedures such as intravenous cannulation, “cut downs” and suturing have become easier as a result.

In an emergency, oxygen is always required. In current practice, oxygen cylinders in the ward, mounted on oxygen carriers, have to be taken separately to the place where the emergency is managed, competing for space with other necessities in the emergency bay. The in-built oxygen tank and accessories in our desk help overcome this issue.

In conclusion, we recommend the use of power managing devices like the UPS when expensive technical equipment is used to prevent voltage fluctuations damaging electronic circuitry in valuable hospital equipment. We achieved a notable reduction in requirement for support staff in an emergency whose expertise was directed to managing the patient at the outset of an emergency situation. A prototype of this trolley is in operation at the Base Hospital in Diyathalawa. All instruments used in this low-cost trolley were those found in the hospital, no instruments were purchased for this project. The items we purchased were a sheet of “MDF” board and adhesives which cost around Rs 3,000.

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Multipara Monitor

Light Source

Suction apparatus

Defibrillator

Oxygen Tank

Switches



Cupboards for Storage