

A Proposed New Mnemonic (ABCDE-FFFF) for the Management of Critically Ill Patients in a Low-Resource Setting

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INTRODUCTION

The COVID-19 pandemic has brought the world's attention to the difficulty of suddenly being confronted with a large number of critically ill patients such that the health care system is overwhelmed. There is tension between doing what is best for the individual patient and doing what is best for the community at large [1-5]. High-Income Countries (HIC) are rarely faced with such dilemmas. On the other hand, Low-and-Middle Income Countries (LMICs) face chronic shortages of health care workers, supplies, and other resources. Whether natural or man-made, including the current coronavirus pandemic, disasters make it imperative that LMICs develop strategies to deal with such situations since they will likely be left to fend for themselves with little or no outside help.

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ALGORITHMS FOR DEALING WITH CRITICALLY ILL/INJURED PATIENTS

Management of critically ill or injured patients requires rapid and systematic care, focusing on life-saving priorities [6, 7]. The emphasis is on the immediate recognition and treatment of threats to life. This approach enables the clinician to make the best use of the limited time available to avert tragedy. Algorithms have been shown to improve teamwork and increase confidence in recognizing and managing acutely ill patients [8]. Since the development of the Advanced Trauma Life Support (ATLS) course forty years ago [9], it has become the standard practice internationally to use an 'ABCDE' model for the initial evaluation and treatment of severely injured patients (table 1) [9,10,11].

The utility of lettered mnemonics and algorithms is apparent. They help healthcare providers, especially those with limited clinical experience, follow a defined sequence of steps to pro-

vide the best possible outcomes for severely ill and injured patients. The American Heart Association Basic Life Support (BLS) course uses the mnemonic CAB for compression, airway, and breathing. Likewise, the Advanced Cardiac Life Support (ACLS) extends the list to CABD with D standing for defibrillation [12,13].

Adaptations of the ATLS algorithm (ABCDE) include one for military trauma (<C>ABCDE) where the added <C> stands for "catastrophic hemorrhage" because of the recognition that blast and high-energy penetrating trauma can cause death from massive hemorrhage even before airway obstruction does [14].

Similarly, there is an adaptation specific to burns. The Emergency Management of Severe Burns course adds another E and F to the standard trauma ABCDE, with the additional E standing for an estimate of the burn surface area, and the F meaning the fluid regimen required in burns—the algorithm becomes ABCDEEF [15].

Alongside the standard 'ABCDE', some pediatric courses also add

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a supplemental ‘DEFG’: don’t ever forget glucose! More thoroughly, ‘EFGH’ stands for electrolytes, fluid balance, gut, and hormones; ‘IIII’ for injury, infection, immunity, and intoxication. These mnemonics are used in the second assessment of the sick child, especially for continuing critical care [11]. Both of these mnemonics: ABCDEFG and ABCD.EFGH. IIII is a bit unwieldy.

A very different ABCDEF mnemonic has been developed for critical care, aimed at preventing post-intensive care syndrome. In this case, the ‘A’ stands for assessment of pain, and ‘C’ for the choice of analgesia—this mnemonic is not for primary survey resuscitation. However, of note, it does include ‘F’ for family engagement and empowerment [16].

Table 1: ABCDE as defined in ATLS [9]

A	Airway	maintenance, with cervical spine protection
B	Breathing	and ventilation
C	Circulation	with hemorrhage control
D	Disability	neurologic status
E	Exposure	with environmental control: completely undress the patient, but prevent hypothermia

A NEW MNEMONIC ABCDE-FFFF

We propose a new adaptation to the ABCDE mnemonic to manage severely ill or injured patients, which could be used in LMICs where resources are chronically limited. Mass casualties, natural disasters (e.g., earthquakes, tsunamis), and pandemics are almost certain to overwhelm the resources in these situations. The goal of triage must still be to do the most good for the largest number of patients.

The care of critically ill or injured patients in LMIC is usually context-specific. Several authors have described suitable adjustments in the areas of Emergency & Critical care, including the ARDS Kigali Modification [17]. Because of the scarcity of resources, the lack of trained staff, and less reliable functional health care systems, adjustments are needed to deliver optimal care to the patients.

In a low resource resuscitation context, especially when there is a need to intubate and ventilate a patient, our proposed mnemonic takes into consideration other important factors, including the patient’s underlying medical condition (e.g., diabetes, heart disease, renal insufficiency), the financial cost, family involvement, and the patient’s worldview and beliefs. We have added Five ‘F’s (table 2). These five topics should be considered before embarking on complex, resource-dependent levels of care.

Table 2: ABCDE.FFFFF

A	Airway	F	Futility
B	Breathing	F	Facilities
C	Circulation	F	Finances
D	Disability	F	Family
E	Exposure	F	Faith

Futility

Futility refers to the likely outcome for the patient. Is there capacity in the current setting to treat the patient adequately? Does the patient have underlying co-morbidities that would lessen the likelihood of a satisfactory outcome? Would a transfer be necessary to obtain a higher level of care, or are the capabilities simply not available? Is the patient’s condition survivable?

For example, in this particular setting, what is the expected outcome for a patient with burns encompassing 70% of body surface area? Such a patient would probably not survive in a low-resource setting; thus, it would be futile to use the single ventilator or the only ICU bed available before an inevitable death.

Facilities

Facilities refer to the infrastructure, equipment, and human resources at a specific institution. What is available here and now, what can be borrowed from somewhere else, and what could become available soon? For example, is there an available ventilator for the patient in the emergency department? Is there another one in the intensive care unit? Who among the critically sick patients would benefit the most from the available resources? The COVID-19 pandemic has shown that even in HIC, ventilators and personal protective equipment have frequently been lacking.

Finances

Finances refer to the cost of the patient’s care. Ideally, finances should never be a reason to withhold emergency care. Regardless of the level of income, the WHO has resolved that emergency care should be “...part of universal health coverage to ensure the timely and effective delivery of life-saving health care services to those in need” [18]. Unfortunately, in most LMICs, specialized care beyond the resuscitation room is often dependent on the ability to pay for the services.

Therefore, finances have to be considered: will this be covered by the government, the hospital, health insurance, a charity, or the patient and the patient’s family?

To embark on a cost management plan without considering the financial effect on the patient and his/her family is irresponsible.

Family

Family refers to relatives who are concerned about the patient’s best interests. They may also be those who will need to continue care for the patient at home after discharge from the hospital. For patients unable to consent to treatment, are any family members knowledgeable of the patient’s wishes? For example, the family may know that their elderly relative has made it very clear that he/she would rather die than be placed on a ventilator. For example,

how would a family from a remote rural village be able to manage ongoing care at home for a completely quadriplegic patient?

Faith

Finally, faith refers not just to traditional religious beliefs but also to the patient's values and worldviews. The doctor considers the 'best' outcome for the patient may not be what the patient thinks is best. For example, a patient may prefer not to risk surgery even though they might die without it because they do not want to run the risk of lifelong disability. A holistic approach should be taken into consideration while providing life support to our patients.

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CONCLUSION

The 'ABCDE' algorithm is effective in the management of trauma patients and variants of this mnemonic have been used in different clinical settings. We have proposed a new adaptation to help health care providers consider the most appropriate management of critically ill patients in a low-resource environment. The mnemonic 'ABCDE.FFFFF' could benefit clinicians in balancing optimal emergency care with the available resources.

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