

Essential Emergency and Critical Care: a priority for health systems globally

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Key Points

(3-5 bulleted sentences indicating the main takeaways/defining elements of the article)

- Critical illness is common, and the majority of critically ill patients are cared for outside intensive care units in emergency departments and general hospital wards
- The COVID-19 pandemic has led to surges of critical illness that has threatened to overwhelm health systems
- Essential Emergency and Critical Care (EECC) has been defined as the care that all critically ill patients should receive in all wards and units in all hospitals in the world
- The large unmet need for EECC across medical specialties in hospitals is likely to contribute to substantial numbers of preventable deaths
- EECC is a vital part of Universal Health Coverage and can provide resilience for health systems to handle pandemics and other public health emergencies

Worldwide, an estimated 45 million people suffer from critical illness each year ¹. Critical illness is “a state of ill health with vital organ dysfunction, a high risk of imminent death if care is not provided and the potential for reversibility” ². Patients of all ages and with any condition may deteriorate and become critically ill anywhere within the health system. Although critical illness is often thought of as something mostly relevant for intensive care units (ICUs) or Emergency Departments (EDs), most critically ill patients are cared for in general hospital wards ³⁻⁷. This article outlines a priority for health systems globally: the first-tier care that all critically ill patients should receive described as Essential Emergency and Critical Care (EECC), its relation to other specialties, approaches and initiatives, and opportunities for implementation.

Neglected care of critically ill patients

The care of critically ill patients is often overlooked in hospitals, resulting in delayed and low-quality care.⁸⁻¹⁰ Hospitals are largely organized by specialty, providing care focused on diagnosing and providing definitive treatments, rather than by illness severity, and there can be gaps in critical care provision. The gaps are largest in low-staffed and low-resourced settings, such as in general wards and hospitals in low and middle-income countries (LMICs) ¹¹. In studies from Malawi, only 10%-29% of hypoxic hospitalized patients received supplemental oxygen and 75% of children who died from pneumonia never received oxygen^{4,12,13}. Even in high-income countries, a substantial proportion of preventable deaths and ICU admissions have been seen to be preceded by a lack of clinical monitoring or basic organ support^{14,15}. Health policies have little emphasis on critical care and health systems often lack structures and fail to ensure implementation and coverage of critical illness care.^{8,16,17} The likely result is substantial preventable mortality.^{18,19}

Care of critically ill patients at different resource levels

Treating critical illness can be done at different resource levels. The highest resource level is typically seen in ICUs, in advanced EDs or in operating theatres. Such units, when available, can provide sophisticated, advanced critical care including mechanical ventilation, cardiovascular support and other advanced organ support through intensive human and material resources²⁰. Many hospitals have High Dependency Units (HDUs) which commonly provide care for critically ill patients' that is one step down from ICUs but of greater intensity than care in general wards. HDUs may provide vital organ support up to but not including invasive mechanical ventilation. Critically ill patients are also often managed in general wards, cared for by nurses and doctors who may lack specialist training in the care of critically ill patients. Available resources for care also depend greatly on the existing resources in the health system. In general, smaller health facilities and district hospitals have fewer resources than university or referral centres, hospitals in LMICs have fewer resources than those in high-income countries¹⁷, and there are less staff and services available in hospitals in the night-time and at weekends. Even when resources are low, critical care in the form of early identification of critical illness and the provision of first-tier care has the potential to stabilize vital organ functions and save lives.¹⁸

The COVID-19 Pandemic

The COVID-19 pandemic has highlighted the need for critical care. Each wave of the pandemic has led to a surge of critically ill patients requiring hospital care and treatment for their life-threatening condition.²¹ Health systems have repeatedly become overstretched, with wards, HDUs and ICUs becoming full or overwhelmed, and additional and off-service staff drafted in to work in areas of need. Critically ill patients suffering from other conditions have been unable to access care, and there have been acute shortages of vital treatments such as oxygen²². Huge

global efforts have been made to scale-up intensive care in the pandemic, including designing new mechanical ventilators, shipping advanced ICU equipment around the world and expanding ICU capacities²³. However, it is clear that the fundamental barriers to effective provision of care to critically ill patients could not be overcome with only the procurement of equipment^{24,25}. These barriers include a lack of staff trained in emergency and critical care, health systems and hospitals that were not prepared for the surges of critically ill patients, and a lack of established standards, guidelines and protocols for managing critical illness in low-resource settings²¹.

The optimal approach to the care of critically ill patients

Ideally, all critically ill patients should have the opportunity to receive all the care that they would benefit from. However, the realities of resource constraints mean that approaches need to be context-appropriate and balanced with competing priorities in the local health system. The highest priority care should be introduced before other care. Costs and cost-effectiveness considerations are vital to aid decisions about optimal approaches for maximum impact on population health, guided by ethical principles such as autonomy, equity, beneficence, and justice²⁶.

Essential Emergency and Critical Care

Essential Emergency and Critical Care (EECC) has been developed as the most simple, effective treatments and actions that can save lives of patients with critical illness: the "first tier" of care for critical illness that is less complex than intermediate or advanced forms of emergency and critical care (Figure 1).

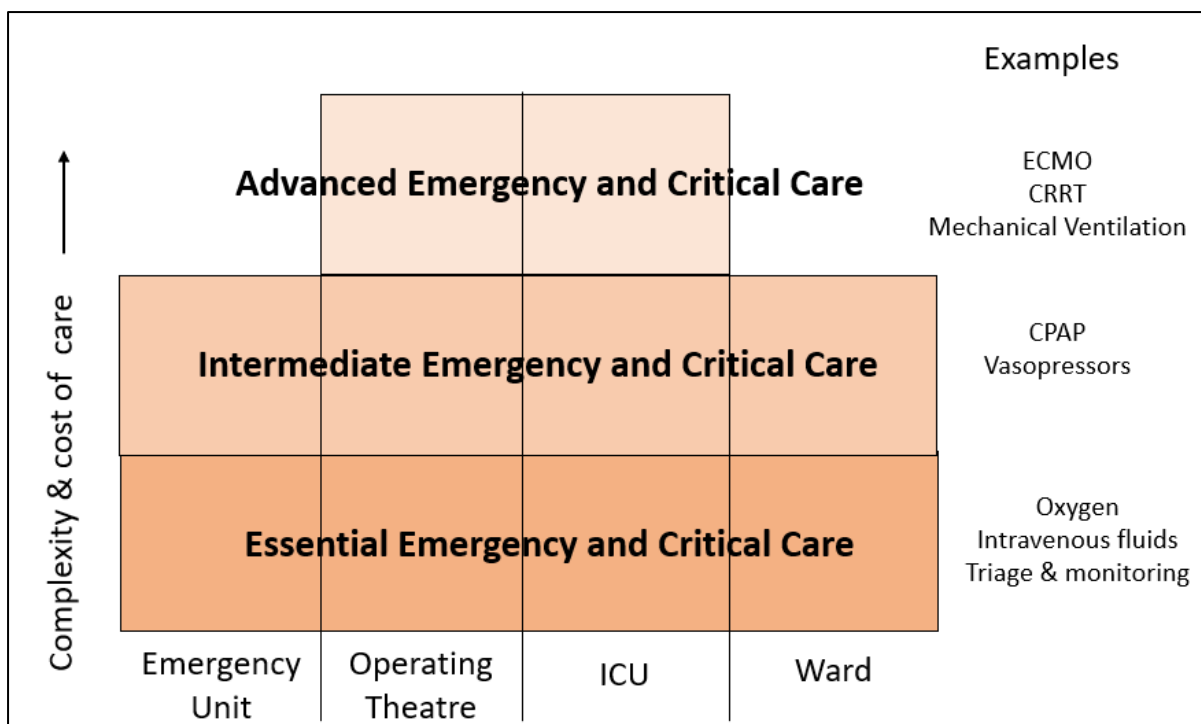


Figure 1: The relationship between Essential, Intermediate and Advanced Emergency and Critical Care. Adapted from Schell CO et al. *Critical Care*. 2018;22(1):284.²⁷
 ECMO Extra-Corporeal Membrane Oxygenation CRRT Continuous Renal Replacement Therapy CPAP Continuous Positive Airway Pressure ICU Intensive Care Unit

EECC is defined as the care that all critically ill patients should receive in all hospitals in the world²⁸ and is the care that supports vital organ functions, the universal care for all critical illness, irrespective of the patient's age, socio-economic status, underlying condition, or treating specialty. EECC is intended to be feasible in all wards and units in all hospitals, complementing specialty-based care and guidelines, and to be task-shared between doctors, nurses, and other health workers. EECC provides a means to bridge the commonly-found quality gap between current practice of care for critical illness and best-practice guidelines. It does not aim to be comprehensive – in addition to EECC, patients should receive other care such as nursing care, diagnostics, definitive and symptomatic care of their condition, end-of-life care if appropriate, and if needed and available, higher levels of emergency and critical care.

EECC is divided into two domains – the *identification* and the *treatment* of critical illness. Each domain requires resources (hospital readiness) to enable the processes of care (clinical practice) to ensure effective coverage of care (Figure 2).

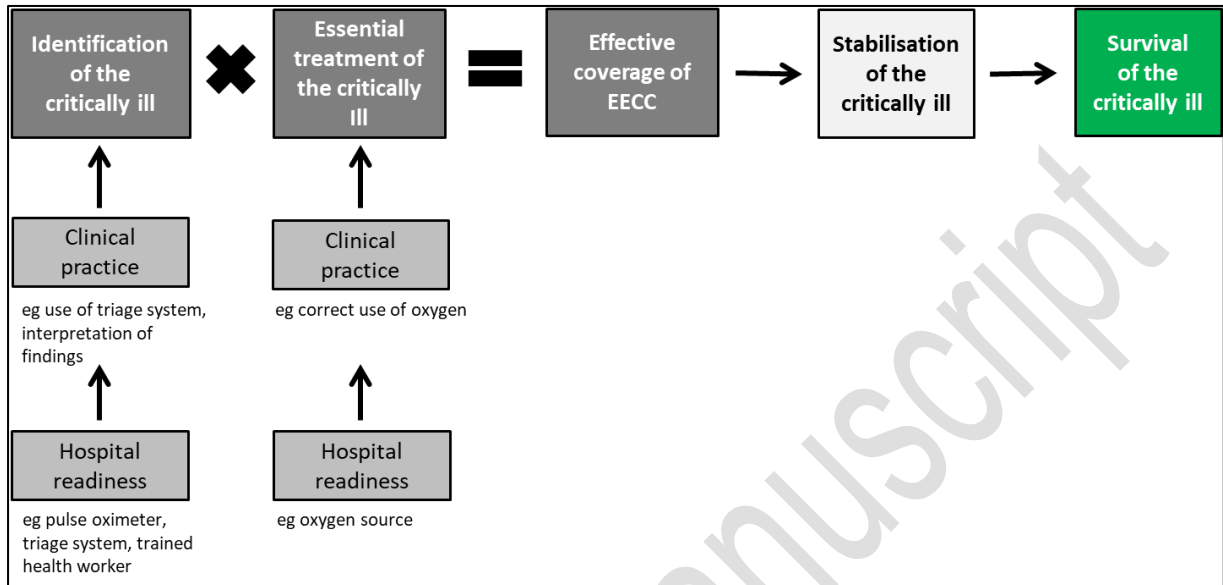


Figure 2: Essential Emergency and Critical Care (EECC): a conceptual framework. Adapted from Schell CO et al. Critical Care. 2018;22(1):284.²⁷

The content of EECC has recently been specified through a consensus of global experts²⁹. EECC contains 40 processes – 30 clinical processes and 10 general processes including such items as triage and monitoring using vital signs, oxygen therapy, intravenous fluids, and patient positioning (see Panel 1). For the provision of these clinical processes, hospital readiness requirements have been specified, divided into the categories of equipment, consumables, drugs, human resources, training, routines, guidelines, and infrastructure.

IDENTIFICATION OF CRITICAL ILLNESS

Critical illness is identified as soon as possible so timely care can be provided.

1. The hospital uses vital signs-based triage to identify critical illness

1.1 Triage/identification of critical illness includes the use of these vital signs

- 1.1.1 Pulse rate
- 1.1.2 Blood pressure
- 1.1.3 Respiratory rate
- 1.1.4 Oxygen saturation (SpO₂)
- 1.1.5 Temperature
- 1.1.6 Level of consciousness (eg. "AVPU", "ACVPU" or Glasgow Coma Scale)
- 1.1.7 Presence of abnormal airway sounds heard from the bedside (eg. snoring, gurgling, stridor)
- 1.1.8 The overall condition of the patient (health worker's concern that the patient is critically ill)

1.2 Triage/identification of critical illness is conducted at these times

- 1.2.1 When a patient arrives at hospital seeking acute care
- 1.2.2 For hospital in-patients, at least every 24 hours, unless otherwise prescribed, with increased frequency for patients who are at risk of becoming critically ill or who are critically ill, and then less frequently again when patients are stabilising
- 1.2.3 When a health worker, or the patient or guardian, is concerned that a patient may be critically ill
- 1.2.4 During and after surgery or anaesthesia
- 1.2.5 During and after transport/transfer of a patient who is critically ill or at risk of becoming critically ill
- 1.2.6 Following a treatment or action (re-evaluation)

CARE OF CRITICAL ILLNESS

Essential care of critical illness is initiated as soon as critical illness is identified and involves these clinical processes when appropriate:

<p>AIRWAY</p> <p>Care for a blocked or threatened airway</p>	<ol style="list-style-type: none"> 2. Placing the patient in the recovery position (lateral position) 3. Age-appropriate airway positioning (eg. chin lift or jaw thrust in adults, neutral position in young children) 4. Removal of any visible foreign body from the mouth or use of age-appropriate chest thrusts/ abdominal thrusts/ back blows in choking 5. Suction for secretions that are obstructing the airway 6. Insertion of an oro-pharyngeal (Guedel) airway
<p>BREATHING</p> <p>Care for hypoxia or respiratory distress</p>	<ol style="list-style-type: none"> 7. Optimizing the patient's position (eg. sitting-up or prone) 8. Oxygen therapy using nasal prongs, facemask, or mask with a reservoir bag (non re-breathing mask) 9. Bag-valve-mask ventilation in threatened or manifest respiratory arrest
<p>CIRCULATION</p> <p>Care for a threatened circulation or shock</p>	<ol style="list-style-type: none"> 10. Optimizing the patient position (eg. lying flat, head-down, raised-legs, lateral tilt in pregnancy) 11. Compression and elevation to stop bleeding 12. Appropriate bolus of intravenous fluid 13. Oral rehydration solution or other appropriate oral fluids for dehydration without shock 14. Intramuscular adrenaline for anaphylaxis 15. Uterine massage and/or oxytocin when indicated
<p>REDUCED CONSCIOUS LEVEL</p> <p>Care for a reduced level of consciousness</p>	<ol style="list-style-type: none"> 16. Treating an unconscious patient as having a threatened airway (eg. recovery position etc) 17. Dextrose (iv or buccal) in unconsciousness or seizures unless bedside blood glucose testing rules out hypoglycaemia or there is a clear alternative cause 18. Protecting patients with a seizure from harm 19. Quick-acting anti-seizure medication (eg. intravenous/rectal diazepam, or magnesium sulphate in pregnancy/post-partum) 20. Cooling in severe hyperthermia with a reduced level of consciousness
<p>OTHER CARE IN EECC</p> <p>Other immediate or ongoing care of critical illness</p>	<ol style="list-style-type: none"> 21. Insertion of an intravenous cannula when critical illness is identified 22. Insertion of an intraosseous cannula, if indicated, if an intravenous cannula is not possible 23. Stabilizing the cervical spine in possible cervical spine injury 24. Appropriate antibiotics for sepsis 25. Treatment of pain and anxiety (eg. with needs-based psychological support, medication) 26. Keeping the patient warm using blankets and other means (including skin-to-skin care for babies) 27. Feeding (including breastfeeding for babies), naso-gastric feeding and dextrose for nutrition and to avoid hypoglycaemia 28. Prevention of delirium (eg. sleep hygiene, provision of the patient's glasses or hearing aid) 29. Regular turning of immobilised patients 30. Mobilising the patient as early as possible

GENERAL PROCESSES

Care is provided according to these general processes:

1. Assistance from additional or senior staff is sought when a critically ill patient is identified
2. Essential Emergency and Critical Care (EECC) is respectful and patient-centred
3. EECC is provided without considering the patient's ability to pay
4. Critically ill patients are cared-for in locations that facilitate observation and care (eg. designated beds, a bay or a unit for critically ill patients)
5. Infection, Prevention and Control (IPC) measures are used including hand hygiene and separation of patients with a suspected or confirmed contagious disease from those without
6. Communication is clear, including:
 - Within the care team when a patient is identified as critically ill (eg. verbal communication, at staff handovers, visible colour-coding)
 - Within the care team about the planned EECC (eg. continue oxygen therapy, give intravenous fluids)
 - Documentation in the patient notes about the vital signs, when critical illness has been identified and the treatments and actions conducted
 - Effective and respectful communication with the patient and family
7. If there is poor response to treatment, or if the patient deteriorates, other indicated EECC clinical processes are used
8. Clinical processes are discontinued that are no longer indicated (eg. if a patient improves or if they are deemed to no longer be in the patient's best interest)
9. It is recognised when EECC alone is not sufficient to manage the critical illness
10. EECC is integrated with care that is outside the scope of EECC (eg. the need for prompt investigations, definitive treatment of underlying conditions including following disease-specific best-practice guidelines, end-of-life care, referral)

Addendum: Extended identification of critical illness

To maintain feasibility of the EECC package, only a limited number of signs for the identification of critical illness are included. However, if time and expertise allow, there are additional signs that are not part of EECC that aid the identification of critical illness:

- Presence of respiratory distress (eg. unable to complete sentences; accessory muscle use; chest recessions; grunting or head nodding)
- Cyanosis
- Capillary refill time
- Cold or warm extremities
- Presence of severe dehydration (eg. decreased skin turgor; dry mucous membranes; sunken fontanelle)
- Confused, agitated or disoriented mental state
- Presence of prostration or lethargy
- Presence of a generalized seizure
- Inability to stand or walk without help
- Inability to breastfeed or feed in a young child
- Presence of severe acute malnutrition

Relationship between EECC and other approaches, initiatives and disciplines

EECC is not a standalone specialty but is rather part of all acute disciplines and complementary to specialty-based diagnostics and definitive therapies. There are considerable specialty-based initiatives and approaches to improving the care and outcomes of sick patients. Some that include simple elements have had significant impact. Introducing oxygen systems for child pneumonia in Papua New Guinea reduced mortality by 35%³⁰. A surgical safety checklist reduced mortality and surgical complications by more than 40%³¹. Strategies should be adopted for the implementation of EECC within existing initiatives with the goal of increasing their positive impact and reducing the unmet need of life-saving basic care to critically ill patients.

EECC and Basic Emergency Care

The WHO/ICRC Basic Emergency Care (BEC) developed in collaboration with the International Federation of Emergency Medicine is a training course designed for frontline physicians and nurses embedded within the Emergency Care Systems framework^{32,33}. It focuses on the initial management of patients suffering trauma, difficulty in breathing, shock, and altered mental states, "treatment of individuals with acute life- or limb-threatening conditions"³⁴, "the care given in the first few hours after the onset of an acute medical or obstetric problem or the occurrence of an injury"³⁵. EECC has its primary focus on severity – critical illness anywhere in the hospital at any point of the patients' illness. EECC includes only the first-tier, life-saving, supportive care of patients' vital functions, while BEC extends beyond this to the provision of diagnostics and definitive therapies. The initiatives have extensive overlap and complement each other to ensure that basic life-saving care is provided in all settings.

EECC and Early Critical Care Services

Early critical care services are the initial care provided to critically ill patients when they become critically ill, often at arrival to hospital. It has been defined as “the early interventions that support vital organ function during the initial care provided to the critically ill patient”¹¹ and stresses the importance of ensuring continuity of care in the transition from the arrivals unit to inpatient care. EECC and early critical care have substantial overlap, with EECC focusing on the most essential, low-cost, feasible care, and the provision of care throughout the critical illness. EECC is the first tier of early critical care services, not limited by specialty, geographical location in the hospital or by the different time points in the in-patient journey.

EECC, Levels of Critical Care and ICUs

Critical care has been described in several levels, from the more basic up to more advanced³⁶. In these terms, EECC is the most basic level of critical care – the fundament that should be provided in all hospital settings. While EECC is enough to stabilize and save the life of many patients, some will require more advanced care to survive. For those for whom EECC is sufficient, transfer to resource-intensive ICUs can be avoided, thereby conserving such a highly-rationed resource for those for whom it is necessary. Although ICUs comprise only a few percent of acute hospital beds, it is an expensive resource³⁷ and can consume 20% of hospital resources³⁸. When more advanced levels of care are available, such as HDUs and ICUs, clear referral and selection policies are required to ensure the optimal selection of patients. EECC could reduce the burden on low ICU bed space capacities especially in LMICs by averting the progression to organ failure and even death from preventable causes.

EECC, Primary Health Care and Universal Health Coverage

As the WHO acknowledges, Primary Health Care including care in first-line district hospitals is fundamental for the equitable delivery of health care to populations.^{39,40} Primary Health Care is a core part of Universal Health Coverage – the equity-based goal that all people should receive the health services they need without financial hardship. EECC, by its definition, can be regarded as the emergency and critical care component of Primary Health Care and Universal Health Coverage, providing an approach for the equitable provision of care to critically ill patients, everywhere in the world. EECC should be seen as integral to Primary Health Care and Universal Health Coverage – strengthening basic health care services through an integrated equity-based approach that will lead to optimal population health.

Trauma care

Trauma is a leading cause of premature death and disability globally^{41,42}. Trauma can cause critical illness through direct damage to vital organs, the systemic effects of trauma and inflammation or complications such as haemorrhage, infection, and renal damage. Recent work has focused on improving trauma care within health systems globally. This has included the initial care of trauma patients through approaches such as Advanced Trauma Life Support (ATLS) and referral systems for transferring the critically injured patient from basic health centres to designated trauma centres⁴³. EECC has a vital role to play in the initial and ongoing care of critically ill trauma patients, including preventing and managing a blocked airway, supplementary oxygen, the control of haemorrhage and fluid resuscitation⁴⁴. EECC should be integrated into trauma systems and be a prioritised focus in trauma care. ATLS and similar programmes revolve around many of the principles of EECC, allowing for integration of these approaches.

Surgery and Anaesthesia

The World Health Assembly in 2015 unanimously adopted a resolution to strengthen emergency and essential surgical and anaesthesia services.⁴⁵ Although surgical interventions have been shown to be efficacious and cost-effective, five billion people lack access to safe surgery^{46,47}. Many surgical patients become critically ill, either due to their underlying surgical condition and co-morbidities, to the stress of the surgery and anaesthesia, or due to complications in the peri-operative period. EECC has a crucial role in the care of peri-operative critical illness, including pre-operative stabilisation, safe anaesthesia, identification of the deteriorating surgical patient, and the provision of the low-cost effective resuscitative measures that can reduce the risk of “failure-to-rescue” and the high postoperative mortality rates that have been identified in LMICs.^{48,49} EECC should be an integral part of peri-operative care and included as a necessary component in the scale-up of surgical services such as the National Surgery, Obstetric and Anaesthesia Plans implemented in many countries.⁵⁰

Emergency Obstetric Care

Preventing maternal and neonatal critical illness and deaths are the goals of emergency obstetric care. Common obstetric conditions leading to critical illness include haemorrhage, eclampsia, and sepsis^{51,52}. Much work has been done to improve acute obstetric care, including the approaches of Basic Emergency Obstetric and Neonatal Care (BEmONC) and Comprehensive Emergency Obstetric and Neonatal Care (CEmONC)^{53,54}. BEmONC contains many of the elements of EECC, including the resuscitation of the critically ill mother and newborn. Ensuring health-workers are trained and hospitals are able to provide EECC to all patients, would benefit obstetric care, and strengthen emergency obstetric services.

Paediatrics and Emergency Triage, Assessment and Treatment

Five million children die each year from conditions such as respiratory infections, diarrhoea, malaria and neonatal conditions⁵⁵. Emergency Triage, Assessment and Treatment (ETAT) is a WHO initiative to identify and treat sick children in low-resource health facilities⁵⁶. Implementing low-cost ETAT is feasible and can halve inpatient mortality among sick children⁵⁷. ETAT recommendations are intended as guidance to frontline workers to ensure that a basic quality of emergency care is maintained. These recommendations involve the same components of care contained in EECC, with the addition of diagnostics and definitive treatments. EECC and ETAT are complementary, and as for obstetric care, a health facility with a workforce and universal systems for the provision of EECC to all patients, will be well-equipped to provide ETAT, even when health workers rotate between specialties.

Early Warning Systems and Rapid Response Teams

Rapid Response Teams (RRT) are in-hospital systems for the identification and care of at-risk and deteriorating patients. Such teams use Early Warning Systems based on patients' vital signs to identify patients developing critical illness and guide early and effective care⁵⁸. Many of the components of EECC are integral to RRTs to ensure that the basics of identification and care of the critically ill are not missed⁵⁹. EWS use compound scoring tools to allocate points to each deteriorating vital sign for risk stratification and above a certain threshold a RRT may be activated, or another action instituted – the same principle as in the identification domain in EECC. RRTs and Early Warning Systems must be tailored to the resources available, and challenges in low-resource settings include the incorrect addition of compound scores and insufficient human resources for an effective RRT.^{6,60} A context-appropriate RRT and EWS in low-resource settings would include the EECC identification and treatment components and through the stabilising of critically ill patients may reduce the number of patients requiring more advanced critical care and improve outcomes.

Infectious diseases and sepsis

Infectious diseases leading to sepsis are a common cause of critical illness and death⁶¹, with an estimate 11 million deaths annually from sepsis.⁶² The basis of the care for sepsis is supportive, life-saving treatment of vital organ dysfunctions – the same care as in EECC – with the addition of definitive antimicrobials and infectious source-control. The implementation of early identification and resuscitative interventions and other care elements contained in EECC are encouraged in sepsis guidelines and have been seen to improve patient outcomes^{63–65}. While international sepsis guidelines, although widely accepted, cannot be fully implemented in many settings worldwide due to resource constraints⁶⁶, EECC provides a feasible approach for the first-tier care of critical illness to all patients with sepsis and other complications of infections.

Non-Communicable Diseases

An increasing proportion of the global burden of disease is caused by Non-Communicable Diseases (NCDs)⁶⁷. Hospitalised patients with an NCD, as other patients, may be misdiagnosed, cared for by the wrong speciality (medicine/surgery), suffer from multiple conditions/co-morbidities or develop a new condition in hospital (e.g. pulmonary embolism or pneumonia). Delivering diagnosis-specific NCD care to all patients is a challenge for any health system around the world, especially resource constrained settings. However, patients with NCDs can become critically ill and require urgent lifesaving care. Implementing low-cost EECC across hospitals would add a safety net for patients with NCD who becomes critically ill, saving lives and gaining time for the definitive care of their underlying condition.

Pandemics and other Public-Health Emergencies

Pandemics and public health emergencies lead to surges of patients with critical illness. Hospitals and health systems need to be prepared to handle these surges and the care of critical illness has had a pivotal role in outbreaks such as COVID-19 and Ebola⁶⁸⁻⁷⁰. Often, high resourced care for critical illness in ICUs is not sufficiently available and cannot be scaled-up fast enough, as has been seen in the COVID-19 pandemic^{71,72}. Provision of the essential care is required, and hospitals with implemented EECC systems prior to a pandemic are likely to be more prepared to scale up services and manage pandemic waves⁷³. Providing EECC involves elements central to pandemic preparedness and response, such as a triage system to categorize patients by illness severity, identification of patients requiring certain therapies and the prioritisation of essential care when demand outstrips supply.

Implementing EECC

Challenges

It is striking that the simple care contained in EECC, for which there is general agreement, is often not implemented. The underlying reasons for this need to be understood and overcome if the basic life-saving care is to be provided to all patients who need it. The reasons may include a lack of public awareness about critical illness and the potential impact of EECC, a lack of prioritization of acute hospital care within global and public health, and a lack of awareness among policymakers about the unmet need of EECC. Such issues, including a combination of professional and economic interest, draw attention away from the basic, but vitally important, components of essential care and towards research and (attempted) implementation of new, advanced technologies.

Increasing Awareness

There is a strong rationale for prioritizing the essential care that comprises EECC above care with less potential impact. As awareness of the unmet need of EECC and the potential of increasing coverage remains low, increasing awareness may spur implementation efforts. Advocates for improving care for critically ill patients and for EECC must engage with key policymakers at local, national, and global levels, such as governments, the WHO, World Bank, and development partners. Professional societies should be made aware of EECC and how it aligns with their goals and practices. Interprofessional/multidisciplinary collaborations, such as the growing global EECC Network www.eeccnetwork.org can support the dissemination of knowledge with stakeholders at all levels.

Raising public awareness is equally important. Involving patient advocacy organizations, survivors from critical illness and other parts of civil society is needed. The introduction systems that hold caregivers accountable for the provision of EECC could be a strong incentive for rapid change and promote a positive spiral of media attention, public demand and EECC implementation.

Implementation

While EECC can be framed as a patient right and thus is universal for all humans and not intended for local adaptation, the *implementation* of EECC is likely to be most effective and successful if adapted to the local context. The coverage of EECC varies largely between settings and a strategy to implement full EECC coverage will interplay with other local practices. While implementation in a complex system is difficult and requires multifaceted approaches and cooperation across sectors and disciplines, there are several elements that may be necessary or helpful for success.

Training in EECC at scale will be needed. Both pre-service training and in-service refreshers could be mandated to ensure quality and staff confidence. Training would ideally include simulation-based training that is relevant for the local facility⁷⁴, along with mentoring and coaching and a focus on non-technical skills such as leadership, teamwork and communication.

Use of guidelines in clinical practice should focus on practice with the highest potential impact. As overabundance of disease-specific clinical guidelines can result in fatigue among health workers, priorities should be set among guidelines to ensure the most important care is delivered^{75,76}. Equity should be a guiding principle, and when there is conflict, the provision of essential care for all, such as EECC, should be prioritized above advanced care for a few. In addition, it should be ensured that essential care is provided at all times – including at night and at weekends. Prioritizing essential care requires that other services might be reduced, demanding strong and brave leadership. The introduction of patient safety and quality assurance units could assist with hospital-wide oversight, monitoring and quality improvement of essential care.

While implementation of EECC could be attempted within a single department, it should ideally be introduced hospital-wide. Aligning departments and ensuring all health workers are competent in the provision of EECC would increase resilience and raise the chances that the system could cope even when there are surges of patient flow, or when staff rotate between departments.

EECC is designed for task sharing. To improve the use of human resources, all health workers should be skilled in EECC. Innovative strategies for this could include the introduction of vital signs assistants – staff or volunteers trained in simple vital sign measurements and initial

interpretation. Tools and initiatives such as triage, EWS, RRT, and Vital Signs Directed Therapy (VSDT)⁷⁷ could be included in context-appropriate EECC packages. In higher resourced settings, the use of low-cost electronic aids, could assist with implementation.

Research and Continuous Learning

To maintain and improve the quality of EECC provision, tools for assessment, implementation, monitoring and evaluation are required. Robust research into the impact, cost, and potential system-wide side effects of introducing EECC in different settings would assist effective implementation. Implementation success will depend on adaption to the local context, requiring a thorough knowledge of the local processes of change. This could include quantitative bottleneck analyses and in-depth understanding of the determinants of bottlenecks to guide potential strategies. Moreover, the potential impact of EECC could be better assessed by increased knowledge about the burden of critical illness globally.⁷⁸ Changing the processes of care in health facilities and in the health system is complicated, and single approaches to implementation (such as training, or guidelines) are unlikely to succeed. Evaluations of successes and learning what works, in which contexts and why, is crucial to the goal of ensuring that all critically ill patients receive the life-saving, essential emergency and critical care that they require.

Conclusion

EECC is a low-cost solution for a neglected problem with large impact potential. Implementing EECC globally and integrating it with other initiatives and approaches could lead to a substantial reduction of critical illness mortality.

The EECC Network Group

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