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COMMENTARY

From Gaps in Maternity Care to Maternal Rescue: An Interprofessional Implementation Agenda for Anesthesia and Maternal Critical Care in Somalia

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Abstract: Somalia's maternal health system faces a dual challenge: limited access to skilled maternity care and insufficient capacity to rescue women who deteriorate during or after obstetric emergencies. Hemorrhage, hypertensive emergencies including eclampsia, sepsis, obstructed labor, and urgent cesarean delivery require coordinated maternity, anesthesia, nursing, resuscitation, postoperative surveillance, and critical-care functions. This evidence-informed commentary shifts the discussion from documenting gaps to an interprofessional implementation agenda. We propose five linked priorities: a regulated and supported maternity and obstetric-anesthesia workforce; an evidence-based cesarean safety bundle; step-up maternal high-care capacity; early-warning, crisis resource management, escalation, and referral pathways; and routine measurement through maternal and perioperative quality systems. The approach emphasizes actions that referral maternity hospitals can introduce progressively, with named local accountability, team training, minimum resource requirements, and measurable indicators, while avoiding unsupported assumptions about national critical-care capacity. Somalia does not need to wait for a fully developed intensive-care system before improving maternal rescue. The immediate opportunity is to connect five functions that are too often fragmented: competent anesthesia provision, reliable cesarean safety processes, early recognition of deterioration, monitored maternal high care, and accountable review of outcomes. Strengthening these functions as one interprofessional maternal-rescue pathway offers a practical route to reducing preventable severe maternal morbidity and mortality in Somalia.

Plain Language Summary: Women with severe bleeding, eclampsia, sepsis, obstructed labor, or complications around cesarean delivery need several hospital teams to act quickly together. Somalia has major shortages in skilled maternity and anesthesia personnel and in essential resources for monitoring, oxygen, blood, medicines, and step-up care. This commentary explains how referral maternity hospitals can begin strengthening maternal rescue without waiting to build full intensive-care units everywhere. We propose five connected actions: define team competencies and supervision; use an evidence-based cesarean safety bundle; designate monitored maternal high-care beds with trained nursing; link early-warning triggers to clear team roles, escalation, referral, and crisis communication; and review maternal and perioperative outcomes through a small set of indicators. Hospitals can start by assigning an accountable multidisciplinary lead, mapping current gaps, introducing the bundle and escalation pathway, training teams together, and reviewing the first indicators regularly. These steps aim to help maternity teams recognize deterioration earlier, respond reliably to emergencies, and move women to higher levels of care when needed.

Keywords: obstetric anesthesia, maternal critical care, cesarean delivery, patient safety, Somalia, health-system strengthening

Introduction

Somalia remains one of the most difficult settings in which to achieve safe motherhood. The latest United Nations Maternal Mortality Estimation Inter-Agency Group estimates a maternal mortality ratio of 563 deaths per 100,000 live births in 2023, with wide uncertainty reflecting persistent limitations in vital-registration and surveillance systems.[1] In 2026, an estimated 3.7 million

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people require sexual and reproductive health services; only about 32% of births are attended by skilled health personnel, and only 19% of public health facilities are reported to be fully functional.[2] These indicators describe an access crisis, but they also expose a second problem: women who reach a facility with hemorrhage, hypertensive disease, sepsis, obstructed labor, or the need for urgent cesarean delivery require a dependable system for anesthesia, resuscitation, postoperative surveillance, and escalation to critical care.

Obstetric anesthesia is therefore not an isolated operating-room service. It is one component of an interprofessional maternal rescue pathway that also depends on obstetric, midwifery, nursing, laboratory, blood-bank, referral, and critical-care functions. A recent commentary in this journal appropriately identified patient-safety risks affecting obstetric and emergency anesthesia in Somalia.[3] The present commentary takes the next step by focusing on implementation: what minimum clinical and system functions should be established, who should coordinate them at facility level, how maternal critical care can be developed without assuming immediate access to full intensive care units, and which indicators should be measured to assess implementation. This is an evidence-informed policy and clinical commentary based on recent Somalia-specific literature, current United Nations reports, and international anesthesia and maternal critical-care standards; it is not a systematic review.

Why Maternal Rescue Must Be the Organizing Principle

Somalia's surgical, anesthesia, and obstetric workforce assessment identified only 22 anesthesia specialists nationally—approximately 0.2 per 100,000 population—with marked geographic maldistribution.[4] In practice, safe maternity care therefore depends on interprofessional teams that may include nonphysician anesthesia providers, nurses, midwives, obstetric clinicians, laboratory and blood-bank staff, referral personnel, and a small specialist workforce. The policy question is not whether task sharing exists; it is whether each participating cadre works within defined competencies, supervision, continuing education, referral thresholds, and accountability. International standards emphasize that safe anesthesia requires a trained provider continuously present with the patient, reliable oxygenation and ventilation monitoring, circulation monitoring, essential medications and equipment, and a functioning system for recovery and postoperative care.[5] In maternal emergencies, these technical requirements must be paired with crisis resource management (CRM): clear leadership, role allocation, closed-loop communication, situational awareness, use of cognitive aids, and coordinated team response. Multidisciplinary obstetric simulation literature supports team-based training in communication and management of emergencies such as hemorrhage and hypertensive crises.[6,7]

The need for a system approach is reinforced by recent Somalia-specific evidence. In a 2025 cross-sectional study of 320 women undergoing cesarean delivery under spinal anesthesia at a Mogadishu referral hospital, 78.1% developed hypotension. Lack of preloading with intravenous fluid and nonuse of ephedrine were strongly associated with hypotension, alongside anemia and other patient factors.[8] Because the study was observational and single-center, its adjusted odds ratios should not be interpreted as proof that a specific drug or fluid protocol will prevent deaths nationally. Nevertheless, the finding is a clinically important signal: basic hemodynamic preparedness and standardized perioperative processes cannot be optional in maternity operating theatres.

A Five-Part Implementation Agenda

Table 1 summarizes the five priorities. Implementation should begin with multidisciplinary facility governance and a baseline gap assessment, then proceed through small, testable clinical and system changes with named accountability, team training, resource checks, and repeated measurement. The sequence is intentionally progressive so that referral hospitals can start with existing structures while documenting the resources and higher-level support needed for scale-up.

Regulate and Support the Obstetric-Anesthesia Workforce

The first implementation step is to define a facility-level multidisciplinary maternity safety team or designate an existing maternal-health quality committee to coordinate the agenda. This should not be limited to anesthesia personnel: obstetric clinicians, midwives, nurses, anesthesia providers, and relevant support services should be represented. Within that governance structure, the responsible national or subnational professional and health authorities can develop a competency framework defining what different anesthesia cadres may perform, the supervision required for higher-risk cases, and the skills maintained through continuing professional development. Each referral maternity hospital should translate that framework into a 24-hour coverage plan, a named on-call escalation route, and a mechanism for remote or in-person specialist consultation when feasible. Because the

Table 1 Proposed Implementation Priorities for Obstetric Anesthesia and Maternal Rescue in Somalia

Domain	Immediate Implementation Priority	Accountability / First Step	Minimum Enabling Resources	Suggested Indicator
Workforce and governance	Define competencies, supervision, referral thresholds, 24-hour coverage plans, continuing professional development, and interprofessional CRM training.	Multidisciplinary maternity safety team; begin with staffing and competency mapping and named escalation responsibility.	Staff roster; supervision and consultation pathway; training time; simple simulation/cognitive aids.	Coverage gaps; proportion of staff with documented competency review; emergency team-training completion.
Safe cesarean care	Implement an evidence-based clinical bundle covering assessment, monitoring, hemorrhage risk, IV access, fluids/vasopressor planning, neuraxial technique, airway rescue, and recovery handover.	Maternity theatre team; adapt a one-page checklist, assign item ownership, pilot, and review missed items.	Reliable BP and pulse-oximetry monitoring; oxygen; airway equipment; essential medicines; blood access.	Bundle compliance; reasons for missed items; anesthesia-related critical events.
Maternal high care	Designate monitored beds with trained nursing/midwifery observation, treatment protocols, and ICU escalation criteria.	Maternity and critical-care leads; define admission/escalation criteria and nursing observation standard.	Monitored bed space; oxygen; vital-sign monitoring; infusion capability; emergency medicines; trained staff.	Eligible women receiving high-care monitoring; deterioration-to-higher-care interval; transfer delays.
Recognition, CRM and referral	Use an obstetric early-warning and escalation pathway linked to team leadership, role allocation, communication, stabilization, transport, and receiving-facility readiness.	Maternity safety team; agree one escalation chart, orient all shifts, and rehearse hemorrhage/eclampsia/sepsis emergencies.	Observation chart; communication method; transport/referral contacts; cognitive aids; simulation time.	Trigger-to-clinician review time; referral-to-definitive-care interval; documented escalation failures.
Data and accountability	Include perioperative contributors in severe maternal outcome review and maintain a small maternal-rescue dashboard.	Quality/maternal-death review team; define indicators, data sources, review frequency, and responsible person.	Simple register or spreadsheet; protected review time; access to theatre, maternity, referral and outcome records.	Completeness of multidisciplinary review; action items completed; trends in clinical-process indicators and preventable delays.

published evidence does not identify a single existing Somali body that can be assumed to own these functions, local institutions should assign responsibility explicitly rather than leaving it implicit. Implementation can begin with a baseline roster and competency mapping, followed by gap-based training, supervision arrangements, and quarterly review of coverage and escalation failures. Task sharing should complement, not replace, long-term specialist workforce investment.[4,5] Interprofessional CRM training should accompany technical training so that midwives, nurses, obstetric and anesthesia personnel rehearse leadership, role allocation, communication, and coordinated response to hemorrhage, eclampsia, difficult airway, and maternal deterioration.[6,7]

Introduce a Minimum Safe-Cesarean Anesthesia Bundle

The cesarean safety bundle should define clinical actions that must occur for every case: preanesthetic assessment; recognition of anemia and hemorrhage risk; confirmation of intravenous access; blood-pressure and pulse-oximetry monitoring; appropriate fluid and vasopressor planning; standardized neuraxial technique; readiness for airway rescue and conversion to general anesthesia; and structured post-anesthesia handover. International standards and context-relevant cesarean checklist work provide an evidence base for these clinical processes.[5,8,9] Staffing models, oxygen systems, monitors, airway equipment, medicines, blood availability, and supply reliability should be audited in parallel as infrastructure and system-readiness requirements rather than treated as clinical competency items within the bundle. Before launch, the facility maternity safety team should adapt a one-page checklist to locally available drugs and referral pathways, assign who completes each item, train the full theatre team, and test the

checklist during routine and emergency cesarean care. Early implementation should track bundle completion and reasons for missed items so that procurement problems can be distinguished from training or workflow problems.

Build Maternal High-Care Before Expanding Full ICU Capacity

Published Somalia-specific data do not yet support precise national estimates of dedicated obstetric high-dependency or intensive-care capacity. That evidence gap should be acknowledged rather than replaced by absolute claims. A feasible first step at major referral maternity hospitals is to designate monitored maternal high-care beds for women who need closer observation and treatment but not invasive organ support. These beds depend heavily on appropriately trained nursing or midwifery staff, with defined clinician review and escalation. Minimum functions should include continuous or frequent vital-sign monitoring, oxygen therapy, intravenous infusions, magnesium sulfate and antihypertensive protocols, hemorrhage resuscitation, sepsis care, fluid-balance monitoring, and clear criteria for transfer to general intensive care when organ support is required. Experience from low- and middle-income settings supports tiered maternal high-care and critical-care models.[10] The relevance of the resource-limited setting is not that acuity should be valued differently, but that scarce staff, monitors, oxygen, and critical-care beds require explicit triage and step-up criteria so that available resources are matched to clinical severity. Facilities should begin by identifying an area near maternity or recovery, defining the nursing observation standard and admission/escalation criteria, confirming essential equipment and medicines, and auditing delays in transfer to higher-level care.

Link Early Recognition to Escalation and Referral

An early-warning chart has little value unless an abnormal observation triggers a defined response. Maternity services should adopt a simple obstetric early-warning and escalation pathway that specifies the urgency and seniority of review, immediate stabilization actions, monitoring frequency, and criteria for transfer to theatre, maternal high care, or intensive care. Early-warning systems are intended to connect abnormal physiological observations with timely clinical assessment and escalation, but thresholds and response protocols require local validation and governance rather than uncritical transfer from another population.[11,12] The operational model should use CRM principles: a named team leader during emergencies, explicit role assignment and delegation, closed-loop communication, early calls for additional help, and cognitive aids for hemorrhage, eclampsia, sepsis, airway emergencies, and maternal collapse.[6,7] The pathway should extend beyond the hospital: referral facilities need communication channels and transport arrangements so that a woman is not transferred without advance notification, stabilization, and confirmation that the receiving facility can provide the required service. Facilities can implement this priority by agreeing a single escalation chart, orienting all maternity shifts, rehearsing common emergencies through low-cost multidisciplinary simulation, and reviewing trigger-to-review and referral-to-definitive-care intervals.

Make Anesthesia and Critical-Care Outcomes Visible

Maternal mortality surveillance and response should explicitly capture perioperative and anesthesia-related contributors, including failed airway management, severe spinal hypotension, delayed blood availability, postoperative deterioration, unplanned intensive-care admission, and delays in escalation. Hospitals can begin with a small dashboard: percentage of cesarean deliveries with complete bundle documentation, availability failures involving oxygen or essential rescue medicines, anesthesia-related critical events, trigger-to-clinician review time, transfer time to higher-level care, and completion of multidisciplinary review for severe maternal outcomes. Each indicator should have a defined numerator and denominator where applicable, a data source, a review frequency, and an accountable team. The purpose is not only transparency: repeated measurement allows facilities to identify whether a change in training, workflow, staffing, referral, or infrastructure is followed by better clinical-process indicators or fewer preventable delays. Measurement therefore turns the five priorities into an iterative quality-improvement program rather than a one-time policy statement.

Evidence Limitations and Research Priorities

The evidence base remains too limited for claims of national prevalence for many anesthesia and critical-care deficiencies. The workforce assessment is cross-sectional, the spinal-hypotension study represents one referral hospital, and routine national data on perioperative maternal morbidity, postoperative deterioration, intensive-care use, and anesthesia-attributable mortality are sparse.[4,8] This limitation is itself actionable. Multicenter service-readiness studies should measure provider cadres, case volume,

oxygen and electricity reliability, monitoring, airway equipment, blood access, emergency drugs, recovery capacity, nursing capacity, and referral pathways. A national or sentinel-site obstetric-anesthesia registry could then track case mix and safety outcomes. Implementation research should test whether standardized cesarean bundles, interprofessional CRM training, early-warning and escalation pathways, and maternal high-care units address clinical indicators, reduce preventable delays, and improve severe maternal outcomes under Somali conditions.[6,7]

Policy and Partnership Priorities

A practical starting sequence could be led at facility level by a multidisciplinary maternity safety team working with relevant health authorities and professional bodies. First, referral hospitals could map current staffing, competencies, equipment, oxygen, blood access, high-care capacity, referral pathways, and available outcome data. Second, they could select a small set of feasible changes—an evidence-based cesarean safety checklist, one escalation pathway, designated high-care beds, and a basic dashboard—and assign an accountable lead for each. Third, teams could use short interprofessional training and simulation cycles to test workflows before wider use. Fourth, monthly or quarterly review of missed bundle items, escalation delays, critical events, and resource failures could guide the next improvement cycle. Federal and state health authorities, maternity hospitals, training institutions, and professional societies could then use early facility experience to inform broader standards, workforce planning, procurement, and future national surgical, obstetric, and anesthesia planning. International partners may add value by supporting durable systems such as faculty development, simulation training, pulse oximetry and monitoring, oxygen systems, quality-improvement capability, and supply-chain reliability rather than episodic missions. These proposals should be tested and adapted to Somali institutions and available resources; the current evidence base does not establish them as a single proven national solution.[6,7,9]

Conclusion

Somalia does not need to wait for a fully developed intensive-care system before improving maternal rescue. The immediate opportunity is to connect five functions that are too often fragmented: competent anesthesia provision, reliable cesarean safety processes, early recognition of deterioration, monitored maternal high care, and accountable review of outcomes. These functions require different but coordinated interventions. Clinical competency requires defined scopes of practice, supervision, interprofessional CRM, emergency protocols, and continuing training; infrastructure readiness requires reliable oxygen, monitoring, airway equipment, medicines, blood access, staffed high-care capacity, and referral transport. A practical first step for referral maternity hospitals is to designate a multidisciplinary maternity safety team, complete a baseline gap assessment, and assign accountable leads for the cesarean bundle, escalation pathway, high-care function, and outcome dashboard. Hemorrhage, eclampsia, sepsis, airway emergencies, and postoperative deterioration should be used as priority scenarios for team training and pathway testing. An evidence-based, tiered maternal-rescue model with explicit governance, measurable indicators, and progressive strengthening of clinical and infrastructure capacity can align anesthesia safety with the broader mission of maternity care: preventing avoidable death and disability during pregnancy and childbirth.[5–7,9,10]

Abbreviations

ICU, intensive care unit; LMIC, low- and middle-income country; UNFPA, United Nations Population Fund; WHO, World Health Organization; WFSA, World Federation of Societies of Anaesthesiologists.

Data Sharing Statement

No datasets were generated or analyzed for this commentary.

Ethics Approval and Informed Consent

Not applicable. This commentary did not involve primary research with human participants, human data, or animals.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no competing interests.

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