



Impact of Critical Care Nurses in Resource Limited Environments

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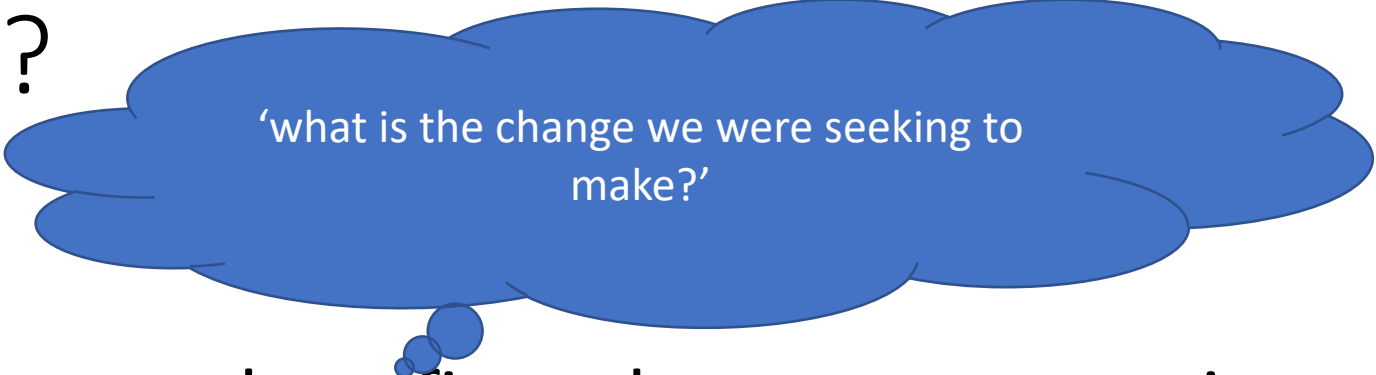


Aim

To identify and assess the impact on emergency, trauma and critical care services, following the capacity building of specialist nursing in Zambia, with lessons learnt for other low-income countries



What is Impact?

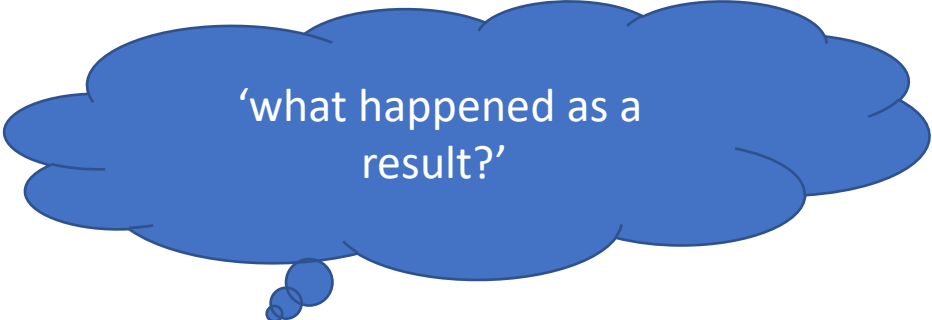


'what is the change we were seeking to make?'

'an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia' (Research Excellence Framework, 2021)



'so what... why should anyone care?'



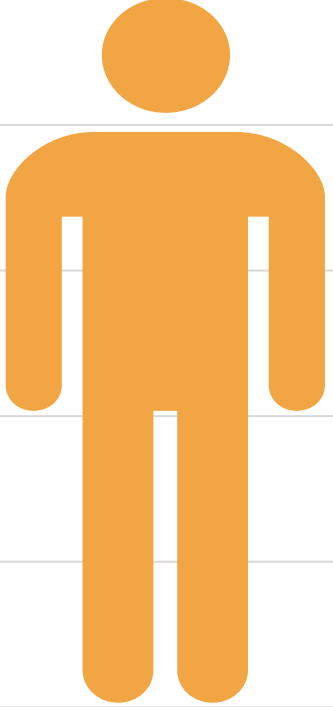
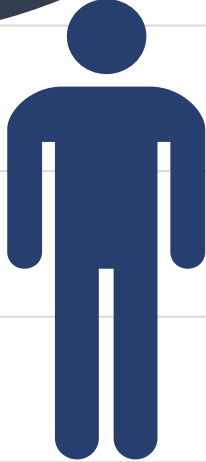
'what happened as a result?'

HIV/TB/Malaria
36%
of development assistance
for health

Trauma care
1%

Annual deaths in millio

3
2
1
0



HIV/AIDS, TB and Malaria combined

Injury

Emergency & Critical care is a good investment



...and helps avoid the high costs of:

- Early death
- Complications
- Prolonged recovery
- Preventable disability

→ Lost wages and productivity for society

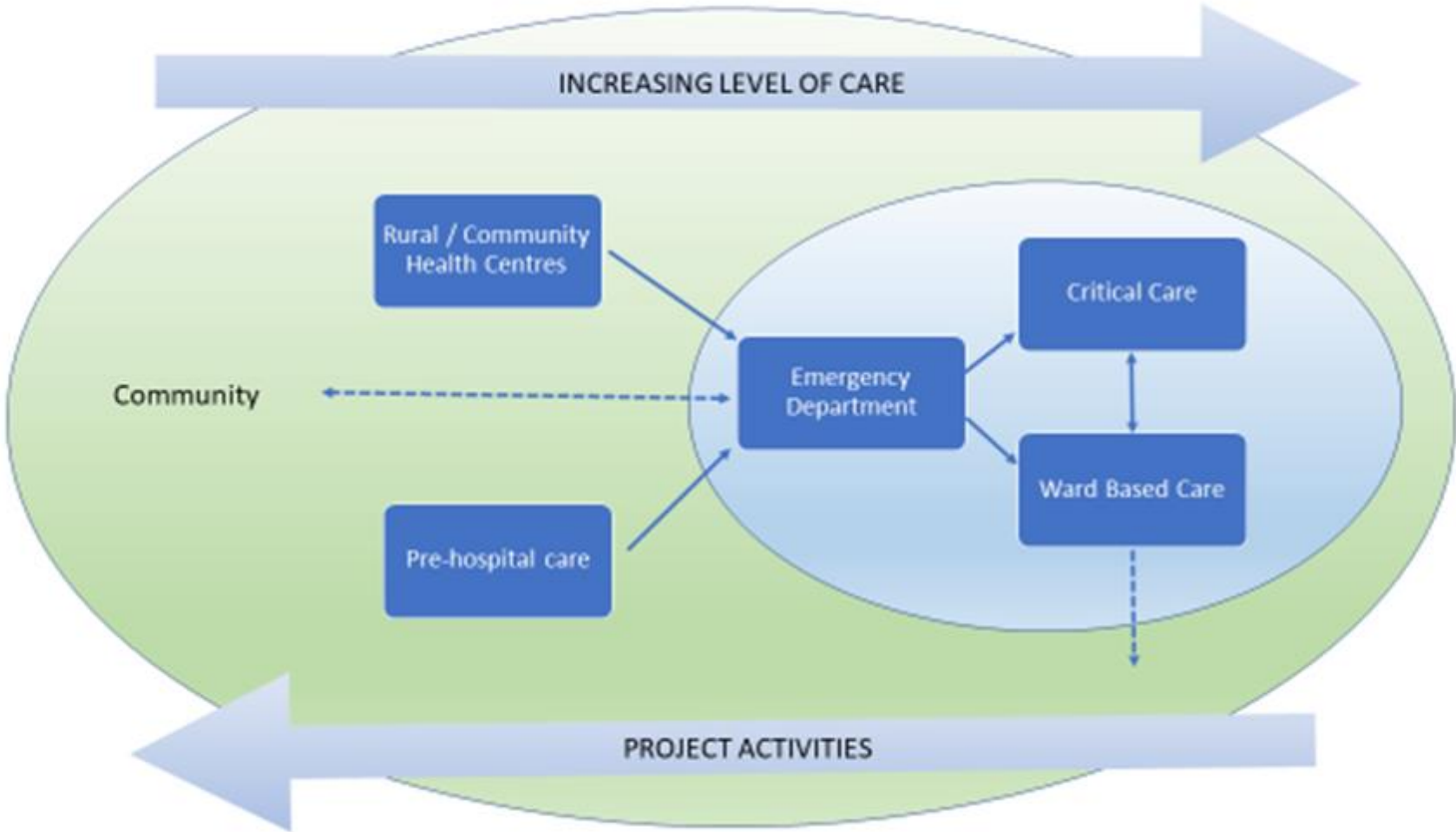
Emergency, Trauma and Critical Care Provision

- Emergency, trauma and critical care nursing are relatively new specialities in sub-Saharan Africa.
- Access to critical care services in sub-Saharan Africa is limited
 - South Africa has 6.0 critical care beds (which can provide mechanical ventilation) per 100,000 (Ayebale et al., 2020).
 - Uganda and Malawi have **0.1 per 100,000** (Wong et al., 2020)
 - Zambia **<1 critical care bed per 100,000** population (Murthy et al, 2015)
- Rae et al's (2021) systematic review concluded that higher levels of critical care nurse staffing are beneficial to patients, staff and health services. This is supported by Assaye et al's (2021) review of nursing in low- and middle-income countries.

Patient Pathway Context

- University Teaching Hospital (UTH) is a national referral hospital for Zambia serving an estimated catchment area of 3million (Lusaka) and a population of 20 million
 - Critical Care: 35 nurses (including 8 Registered Critical Care Nurses).
 - Triage / Resus: 54 nurses (including 6 Registered Emergency & Trauma Nurses / 1 RCCN / 3 BSc)
- A retrospective peer review using a patient pathway review methodology
 - 10 patient files included agreeing the ideal pathway and what is expected to happen to most patients, through a critical review of the actual pathway (Kwok et al., 2021)
 - An international team reviewed case notes, reports were then independently reviewed by another team

Patient Pathway

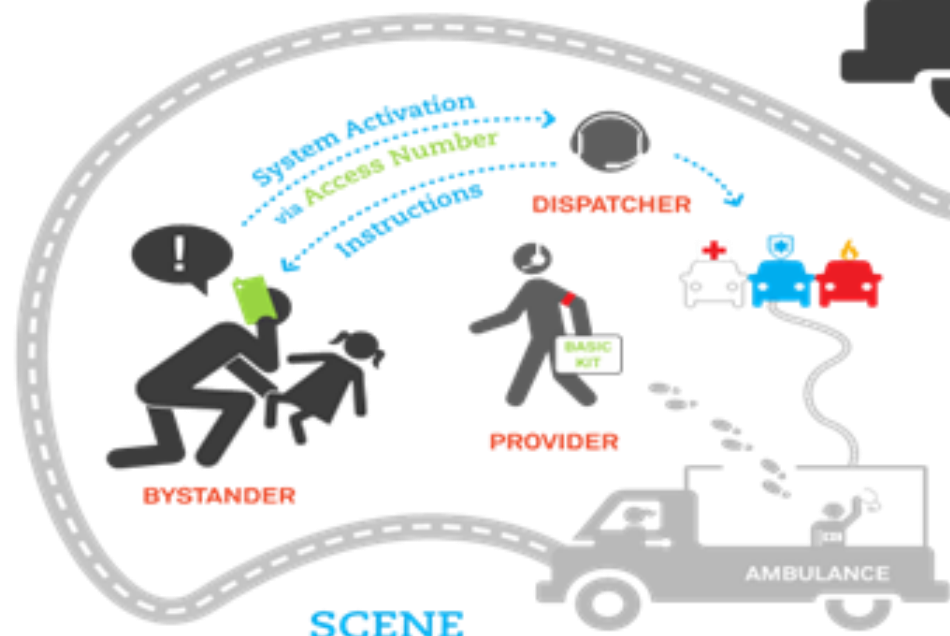
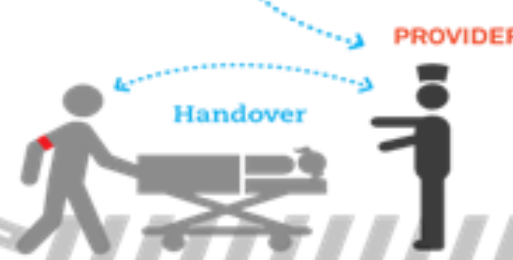
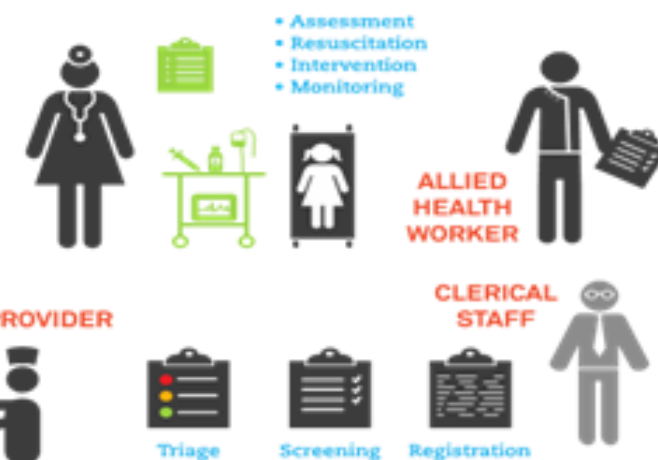
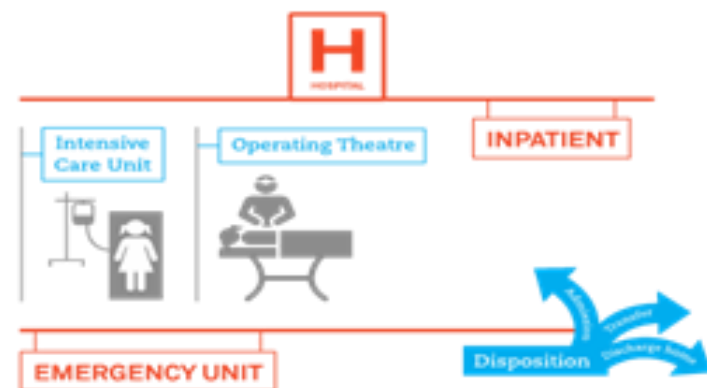


EMERGENCY CARE SYSTEM FRAMEWORK

All around the world, acutely ill and injured people seek care every day. Frontline providers manage children and adults with injuries and infections, heart attacks and strokes, asthma and acute complications of pregnancy. An integrated approach to early recognition and management reduces the impact of all of these conditions. Emergency care could address over half of the deaths in low- and middle-income countries.



■ HUMAN RESOURCES
 ■ FUNCTIONS
 ■ EQUIPMENT, SUPPLIES, INFORMATION TECHNOLOGIES



- SCENE**
- BYSTANDER RESPONSE
 - DISPATCH
 - PROVIDER RESPONSE

TRANSPORT

- PATIENT TRANSPORT
- TRANSPORT CARE

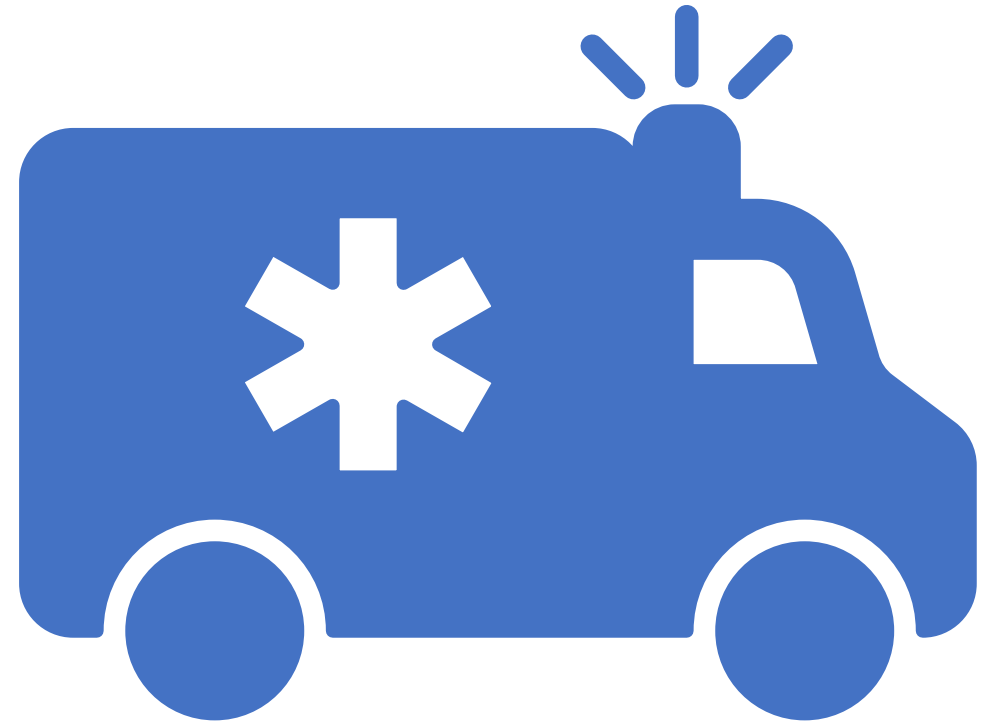
FACILITY

- RECEPTION
- EMERGENCY UNIT CARE
- DISPOSITION
- EARLY INPATIENT CARE

Where we are at

‘There is a shortage of ambulances, with one ambulance for 3-4 facilities.... priority is given to maternity cases, even if it is immediately life threatening... general hospitals should have high dependency units ... however ... there are challenges with equipment and skills’

‘Orientations of 3-4 days don’t make a difference... we need to train a cadre... we need the bigger hospitals to go down to the smaller hospital and mentor the staff’



'We need to think differently'

'I had a 7-day old neonate, ... the mother brought the child to the clinic after four days ... the baby had developed gangrene its feet were black... at the clinic ... there was ... no power so they could not give the baby oxygen ... so they left it in a corner somewhere... it was only when a Paediatric Registrar was doing an outreach visit to the clinic they found the baby... she rushed the baby to theatre to resuscitate it... referral to the UTH PICU was made at 07.00 ... it was not transferred until 16.00... we did what we could ...could not reverse the pathophysiology and severe acidosis... 24 hours later the baby died... we lost so much time... at home... at the clinic... getting the baby to UTH... we need critical care nurses to operate at the lower-level facilities... instead of ushering the child into their final hours.'



*'When we looked
we saw nothing'*



What did we do?

'We remembered...'

'...there was a boy who was discharged over a 2 day public holiday... he was brought back to critical care as he had deteriorated... general ward nurses don't know how to give oxygen... we need critical care nurses everywhere...'

'we had to change things ... now we go to see patients discharged from critical care...'

'The crisis was felt by everyone'

'...with rising numbers of Covid-19 cases we had to find critical care nurses to open an additional Covid-19 treatment centre however ... we had completely exhausted all options for nurses... the Ministry of Health informed us the centre had to open at 09.00... as patients would be arriving at 14.00 ... we were stuck in the middle... we had to call on trauma and emergency nurses as we had exhausted all our critical care nurses...'

'We train them and then they go'

'...We train the nurses... but what strategies for retention are not there... we were promised positions ... but few were created... still RN's or EN's... some have Masters but paid as RN's... when we presented the numbers trained to the NMCZ it was higher than the records... more are calling for transcript going out...'

Workstreams

Strategic:

- National Career Framework for specialist nursing practice
- Template for specialist BSc programmes
- Stakeholders roundtable discussion
- National Workforce Reviews (x2)
- Establishment of Professional Membership organisations

Education:

- Upgrading of Advanced Diploma programmes
- Introduction of BSc programmes
- Recognition of prior experiential learning

Practice:

- Expanding emergency and critical care provision
- Clinical Leadership projects
- Emerging Leaders Programme
- Quality Improvement projects
- Mentorship in practice
- Virtual community of practice
- CPD / Conferences

Career Structure & Access to Higher Education



Template for specialist practice from pre-service to PhD

Recognition of Prior Experiential Learning 'fast tracking'

Introduction of new programmes at higher level Diploma, BSc and MSc level



Critical Care Nursing

- Safe Use of Oxygen Therapy
- Orientation of RNs to CPR
- Low-cost, highly sustainable enteral nutrition project
- Wound care
- Revised nursing documentation
- Nursing ward rounds
- Rehabilitation Post ICU Discharge

- Enhance Infection Prevention Practice:
 - St Francis Mission Hospital, Katete
 - Chipata Central Hospital, Eastern Province

Operating Theatre Nursing

Emergency & Trauma Nursing

- Care of Ventilated patients
- Manual Handling
- Enhancing Pain Assessment and Management
- Safe transfer of patients

Quality Improvement
Projects

Welcome to Kanyama Compound



Compound is a densely populated area (also termed shanty town). Developed during the British Colonial era.

Approximately, 60% of the Lusaka population lives in the peri-urban area that lacks running water and a functioning sewage system (Vonk et al., 2021).

Kanyama is located on the western outskirts of Lusaka, and is one of the 'newer' compounds, however, the exact date it started to develop is unknown.

Now the largest compound in Zambia and is an area that continues to experience high health problems including flooding causing cholera (Sinyange et al., 2015).

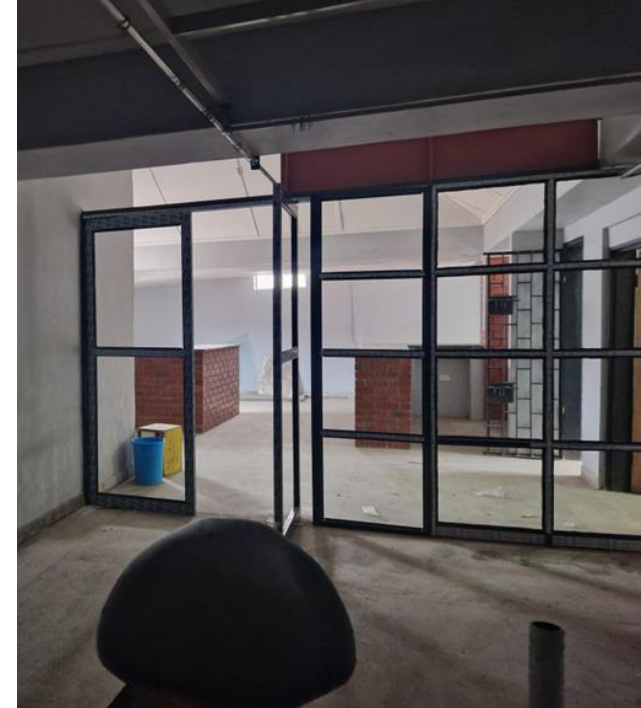
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KANYAMA LEVEL 1 HOSPITAL MATERNITY UNIT MATRIX								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST
	992							
	854							
	723							
ON	81							
	11							
	00							
	01							
	60							
	06							
	00							
	962							
H	04							
L BIRTH	09							
	05							
	01							
	10							
	09							
	01							
TO	03							
S	00							
	04							
	11							
	00							
	16							
	02							
	18							
D	232							
H	56				49	49	27	
	30							
	00							
	26							
IVE	102							

Kanyama General Hospital

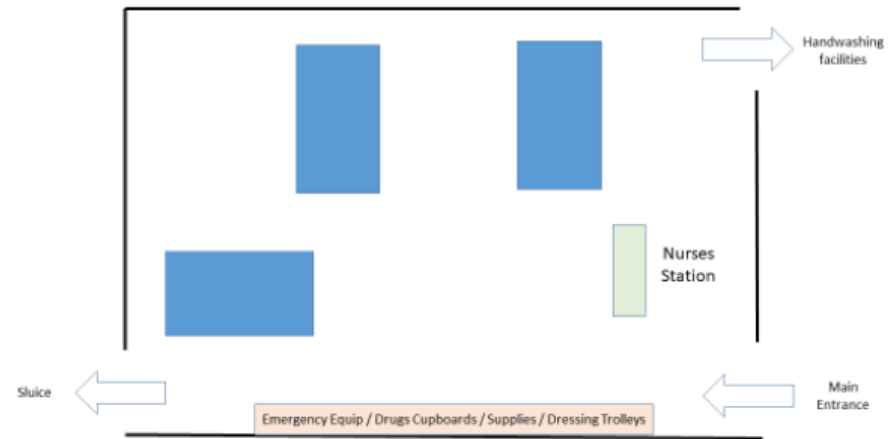
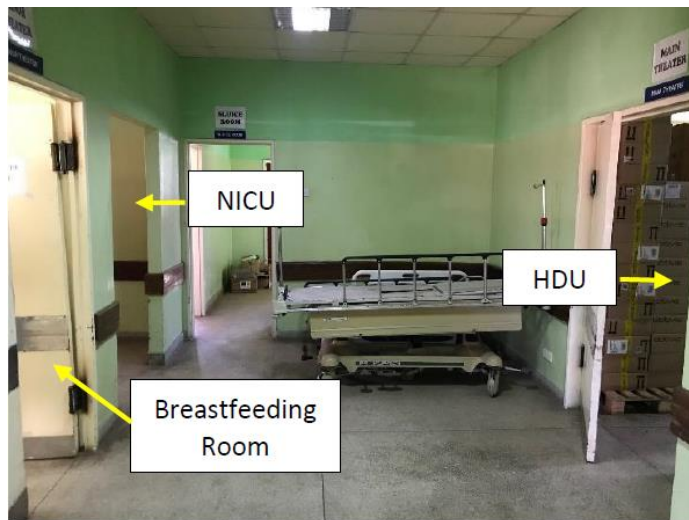
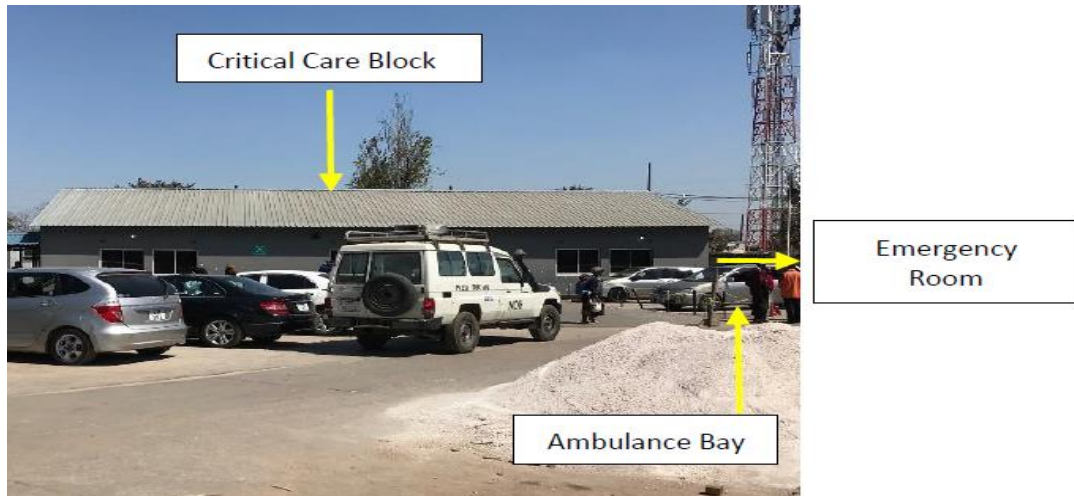
- Upgraded from level 1 clinic to general hospital in 2019
- > 900 deliveries per month
- > 500 patients attending ED daily
- Two bedded resuscitation room
- No high dependency or critical care services (adult / paediatric or neonatal)
- X1 Emergency Nurse
- X2 Nurse Anaesthetists
- Surgeons

KANYAMA LEVEL 1 HOSPITAL MATERNITY UNIT MATRIX												
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
	1121	1009	010	1005	1034	1017	1106	924				
	1033	945	907	929	917	947	952	846				
	913	875	843	844	845	870	872	767				
	70	70	64	85	72	73	80	78				
	13	14	06	08	06	04	07	14				
	00	00	00	00	00	00	00	00				
	02	03	00	04	03	02	02	02				
	102	77	100	85	64	64	72	62				
	10	17	16	06	14	13	05	09				
	00	00	00	00	00	00	01	00				
	1123	1028	1035	988	869	959	1,024	906				
	06	11	04	04	02	10	01	04				
	11	11	10	06	11	15	07	14				
	04	04	03	03	05	06	00	02				
	00	01	00	00	00	00	00	02				
	10	06	10	10	11	11	08	05				
	07	15	16	11	09	14	13	06				
	00	03	00	01	00	00	00	00				
	02	04	00	00	04	07	00	01				
	00	13	00	02	04	00	00	00				
	01	05	01	04	02	03	05	02				
	15	04	05	06	04	04	04	09				
	00	00	00	02	02	04	04	09				
	08	06	01	02	06	00	04	06				
	02	01	02	04	02	04	06	08				
	07	09	14	12	06	10	06	02				
	105	106	96	102	91	104	103	139				
	45	62	67	54	47	55	56	31				
	20	31	30	25	13	26	31	17				
	00	00	00	00	00	00	00	00				
	25	30	30	29	28	29	25	14				
	107	85	89	96	122	38	84	64				



- **New Emergency Department:**
- Dedicated triage area
- 4 bedded resuscitation bay including dedicated paediatric bay
- Privacy – curtains / doors
- Procurement of equipment (monitors, ventilators)
- Power sockets at each bedspace

HDU Project





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EXPERIENCE FROM THE FIELD

International Nursing Review WILEY

The 'sleeping elephant': The role of mentorship of critical care nurses in Zambia

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Abstract

Aim: To develop and evaluate a Zambian context-specific mentorship model that supports registered nurses completing emergency, trauma and critical care programmes in Zambia.

Background: In Zambia, emergency and trauma and critical care nursing are relatively new specialties, with education and training programmes less than a decade old. A train the trainer mentorship programme was developed and delivered at two colleges of nurs-



All projects have a train the trainer focus

Low-cost, highly sustainable enteral nutrition programme for critically ill patients

Pre-project data

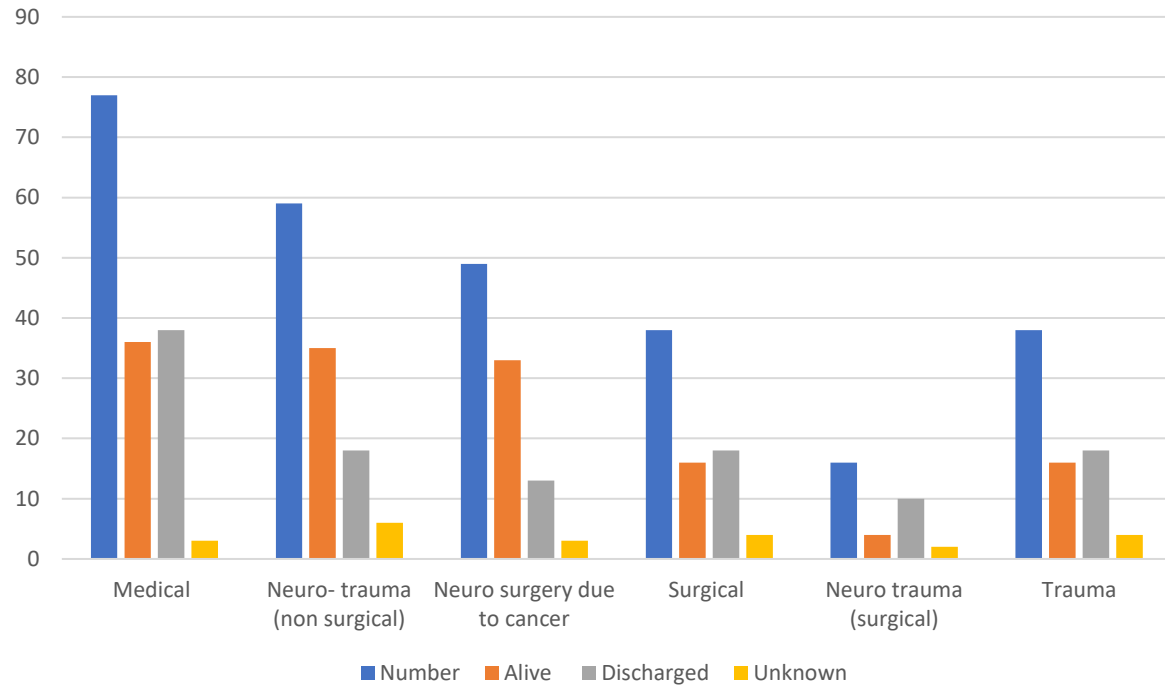
- 16 patients were assessed
- 100% (n=16) of patients were incorrectly positioned (30° head of bed elevation), NGT position were not secured, or their position documented
- 6 (48%) patients developed a pressure ulcer while in the ICU, however, there was no information on grade of pressure ulcer
- 6 patients stayed longer than 7 days, with all patients evidencing a drop in their mid-upper arm circumference (MUAC) (>1.5cm)

Project Aim

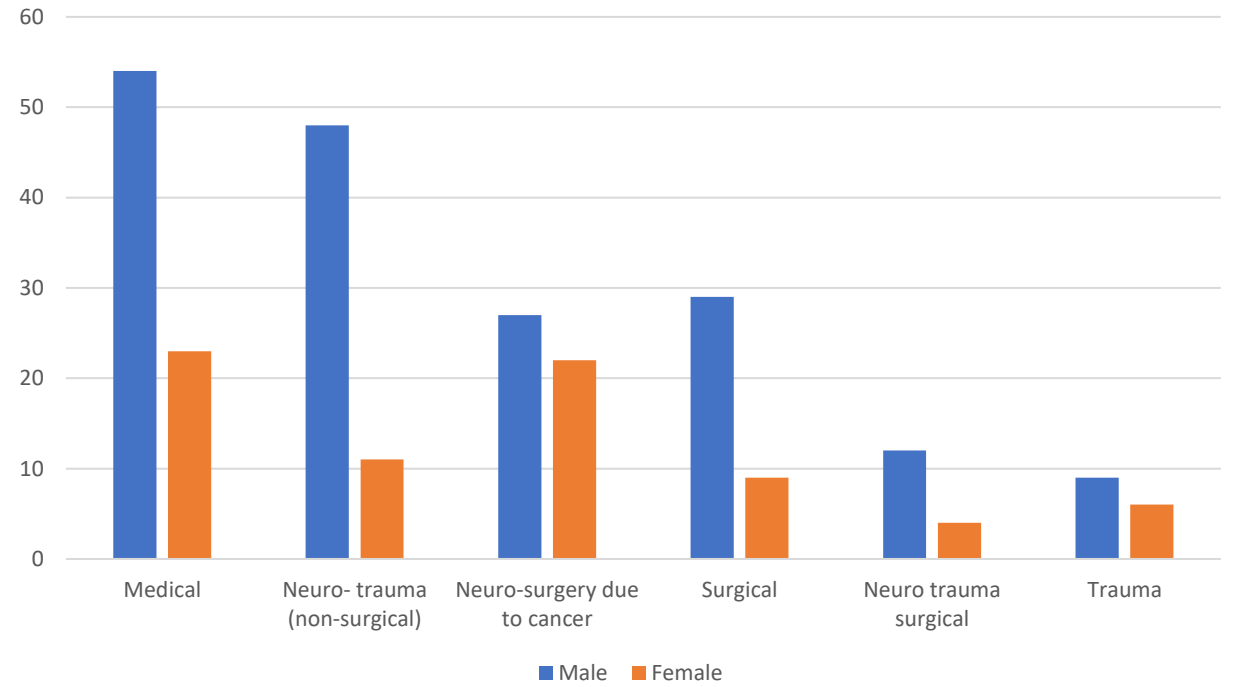
- To develop, implement and evaluate a low-cost, highly sustainable enteral nutrition protocol for critically ill patients.
- Specific aims:
 - To improve NGT safety and documentation
 - To develop and implement pressure ulcer assessment and prevention strategies

Results – 254 patients

Reason for ICU Admission & Outcome



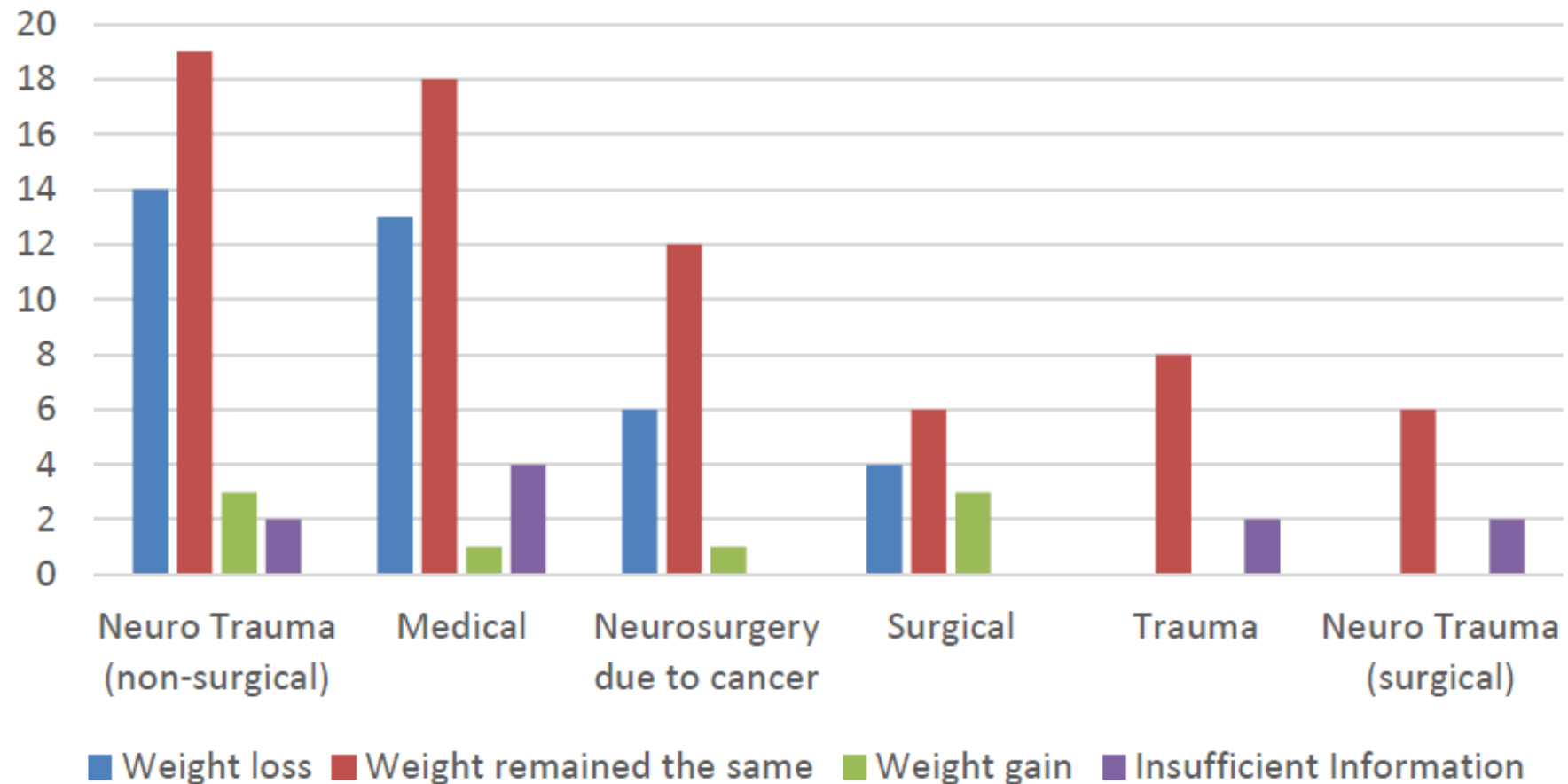
Breakdown Male / Female



MUAC on admission

	MUAC <23.5cm	MUAC >23.5cm	Paediatric Patient	No Info	
Neurosurgery due to cancer	6 (10%)	35 (21%)	8 (32%)		49
Neuro trauma (non-surgical)	14 (23%)	41 (25%)	3 (13%)	1 (17%)	59
Neuro trauma (surgical)	5 (8%)	8 (5%)	3 (13%)		16
Trauma	1 (2%)	11 (7%)	5 (21%)		17
Surgical	13 (22%)	19 (12%)	5 (21%)	1 (17%)	38
Medical	21 (35%)	50 (30%)	0	4 (66%)	75
	60 (24%)	164 (64%)	24 (10%)	6 (2%)	254

Changes in MUAC over time



Head of Bed Elevation & NGT safety

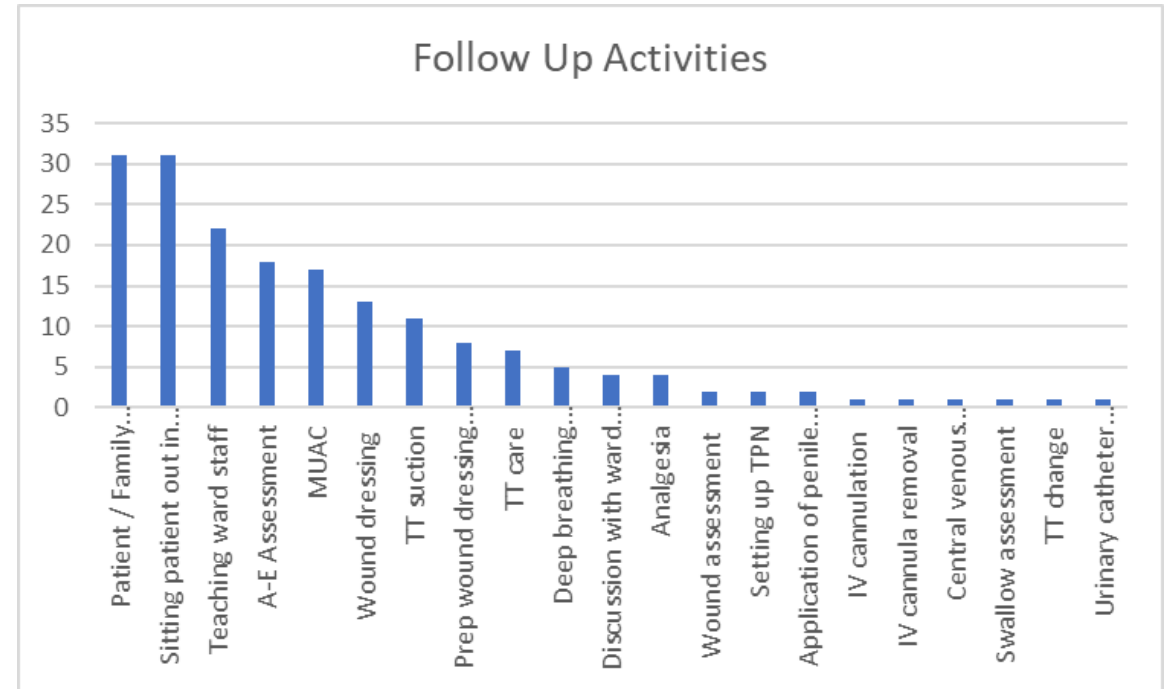
- 798 assessments of head of bed elevation
 - 373 (46.7%) of patient's head of bed was greater than 30 degrees
 - 435 (53.3%) were less than 30 degrees.
- 570 NGT assessments:
 - 346 (60.7%) had an NGT secured
 - 131 (23%) did not have a secured NGT
 - 93 (16.3%) had an orogastric tube in place.

Pressure Ulcer Development

Grade of Pressure Ulcer	Number	Location of Pressure Ulcer	Number
Grade 1	8 (29.6%)	Sacrum	7 (25.9%)
Grade 2	8 (29.6%)	Heel	3 (11.1%)
Grade 3	3 (11.2%)	Ankle	2 (7.4%)
Grade 4	0	Hip	2 (7.4%)
Ungradable	0	Feet	2 (7.4%)
No information	0	Toes	1 (3.7%)

ICU Follow Up Visits (1 month evaluation)

- 76 visits were undertaken (range 1–23, average 6 visits per patient).
- Total of 230 nursing interventions were undertaken





Challenges

- Limited functional ward beds especially for spinal patients making it difficult for positioning
- Patients not be mobilized / sitting out in chair
- No step down/high dependency unit.
- Limited knowledgeable and skilled manpower on the medical/surgical wards
- Shortages of manpower nurses, high nurse patient ratios
- High incidence of patients developing pressure sores
- Conflict ICU seen as 'interfering' with ward patients

Successes

Dear sir/madam,

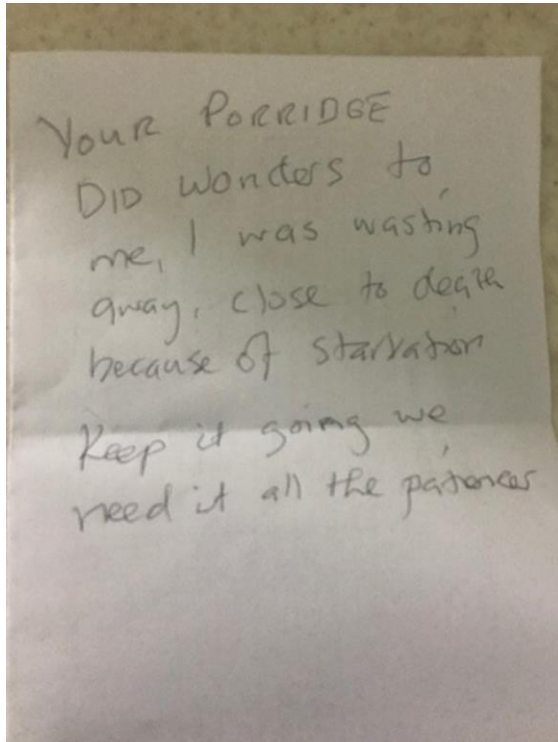
RE: GESTURE OF APPRECIATION

It would be ignoble to leave the hospital without appreciating the job well done to the above named patient, whose life was saved by your angelic approach which was attributed by the following observation:

- you fought religiously since he was admitted in the ICU on 23 January 2023 for any sinister development which was proved by 75 days in intensive care unit with no bed sores.
- you are affable, always wearing enormous sympathetic smiles whether you are on or off duty.
- you indulged in a comprehensive health outreach programs for the management of feeds, turnings and physiotherapy in G11.
- you gave free advice on the necessary medical and nutritional needs for the aftercare supervision

And altruistically you gave us six more days to stay on hospital victuals even after discharge to allow us prepare decently for the departure.

want to thank the management and staff for a well cropped and unique tradition of care.



Sustainability

- Zambia is now a regional hub for critical care education and training. Currently students from:
 - Botswana
 - Lesotho
 - Malawi
 - Zimbabwe
- Recognition critical care is beyond the physical ICU space
 - Train a critical mass of critical care nurses, then extend the service
- Emergency and Critical Care are different specialities
 - Develop them independently

Lessons learned

Critical care nurses needed in lower level facilities and acute settings

Development of a validated early warning scoring tool to identify patients at risk

Critical care nurse / RN ratio 70:30 needed in ICU

Standardised orientation of Registered Nurses working in Critical Care

Need to use tools already developed e.g. ventilator care bundle

Introduction of critical care nursing tools e.g. CCROT

Access to CPD for critical care nurses

Admission & discharge criteria needed

Documentation needs to be a core aspect of critical care nursing practice

Need for specialisation: neonatal burns

Thank you

For more information:

[Centre for International Health Partnerships](#)

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