DEDER GENERAL HOSPITAL

NEONATAL INTENSIVE CARE UNIT (NICU)

CLINICAL AUDIT TO IMPROVE THE QUALITY OF CLINICAL CARE OF BIRTH ASPHYXIA

By: NICU QI Team

Audit phase: Re-Audit *3*

Deder, Oromia

June 2017E.C

ICU case team Clinical Audit/QI team members:

S/N	Name	Responsibility	ReJuneks
1.	Dr. Taju Abdi (MD, Senior)	**Team leader**	
2.	Ismael Abrahim	**Secretory**	
3.	Abdurhaman Bakri	Member	
4.	Abdi Bakar	Member	
5.	Maserat Megarsa	Member	
6.	Abdurhaman Said	Member	
7	Derartu Abdulaziz	Member	

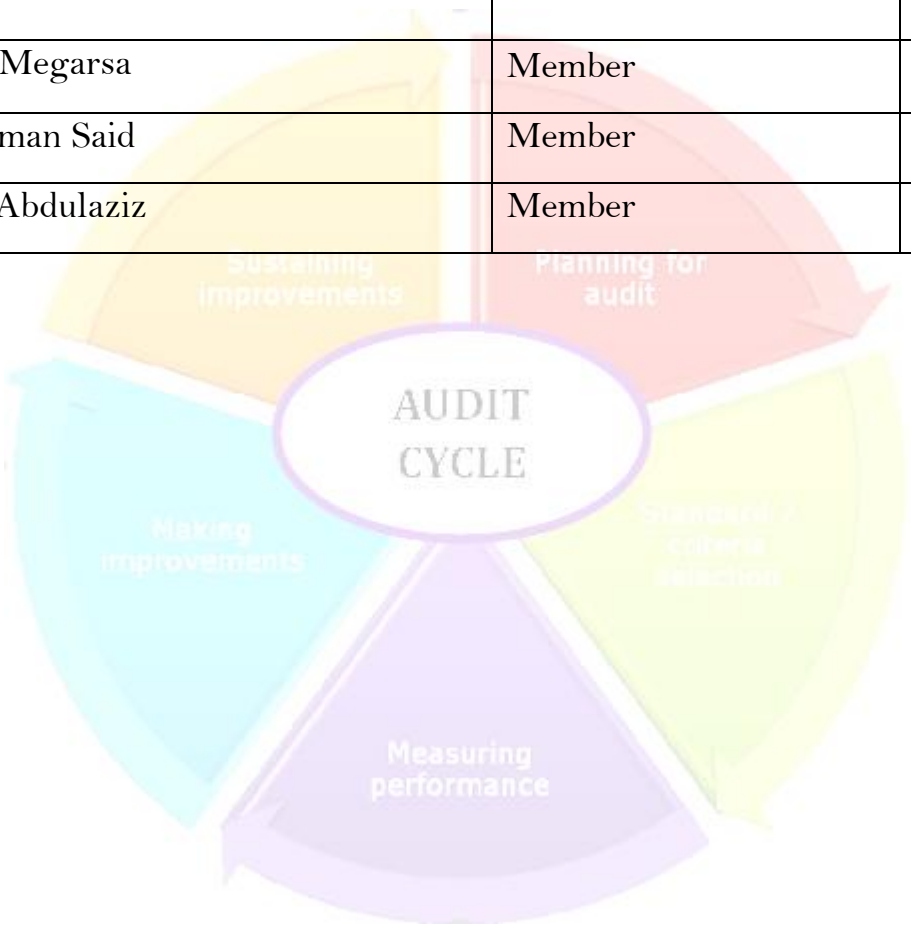

TABLE OF CONTENTS

Contents

List of Figures and Tables

INTRODUCTION

Perinatal asphyxia is defined as a condition that leads to progressive hypoxemia, hypercapnia, and metabolic acidosis with multi-organ failure [1]. Perinatal asphyxia is also defined as the inability of a newborn to initiate and sustain adequate respiration after delivery [2]. According to the American College of Obstetricians and Gynecologists, and the American Academy of Pediatrics, a neonate is labelled to be asphyxiated if (a) umbilical cord arterial pH < 7; (b) Apgar score of 0–3 for longer than 5 min; (c) neonatal neurological manifestations (seizures, coma or hypotonia); and (d) multisystem organ dysfunction (cardiovascular, gastrointestinal, hematological, pulmonary or renal system) [3].

Statement of problem

Globally, 2 to 10 per 1000 term newborns faced perinatal asphyxia [4]. The report of the World health organization (WHO) indicated that 4 million neonatal deaths occur yearly due to birth asphyxia [5]. The incidence of birth asphyxia in most developed countries accounts less than 0.1% of newborn deaths. But, in developing countries, it ranged from 4.6/1000 to 7–26/1000 live births [6]. More than 25.0% of the world's newborn deaths have occurred in Africa. Of those, birth asphyxia accounts 24.0%. From 20 countries in the world with the highest risk of neonatal death, 75.0 % are in Africa [7]. Birth asphyxia, infections and complications of preterm birth together account 88.0% of newborn deaths in Africa. In Sub-Saharan Africa, birth asphyxia brought 280,000 deaths of the newborn in the first day of life [8]. The incidence of asphyxia in East, Central, and Southern Africa was 22.0% [9]. The overall pooled prevalence of perinatal asphyxia in Ethiopia was 24.06% and it is the second commonest cause of neonatal mortality only preceded by prematurity related complications and the commonest cause of disability in surviving newborns (15).

OBJECTIVE

General objective

- To improve the quality of clinical care provided for neonates admitted with the diagnosis of birth asphyxia

Specific objectives

- To ensure neonates with birth asphyxia are appropriately evaluated
- To ensure neonates with birth asphyxia are appropriately investigated
- To ensure neonates with birth asphyxia are appropriately treated
- To ensure neonates with birth asphyxia are appropriately monitored
- To ensure neonates with birth asphyxia receive appropriate discharge care

Methods

Study area & period

The clinical audit was conducted in NICU of Deder General Hospital f r o m **June 21, 2017EC To June 20, 2017E.C**

Study design

Retrospective cross-sectional study

Source population

All charts of Neonates admitted to NICU

Study population

All charts of neonate admitted to NICU with PNA diagnosis

Inclusion criteria

All neonates admitted with a diagnosis of birth asphyxia to NICU

Exclusion criteria

Death on arrival, those who are observed and sent back to mother or discharged within 24 hours.

Sampling technique

A total of 4 medical records (client chart) of the last two months of reporting periods were sampled for the audit. The individual client charts were withdrawn by systematic random sampling.

Study Variables

Dependent variables:

Perinatal Asphyxia

Independent Variables

ANC follow-up, Place of birth, mode of delivery,

Data collection method

Data extraction sheet was adapted from National clinical audit tool

Data Processing & analysis

Data from extraction sheets was manually verified and entered into the SPSS version 25 software for analysis. The software checked data types, sizes, classifications, and allowable values. Corrections were made, and the findings were presented in tables and figures.

RESULT

The actual performance against targets for neonatal asphyxia care in June 2017 E.C. Overall, the total performance achieved was **97%,** indicating a relatively high adherence to the standards. Most criteria, such as identification information recording (100%), appropriate diagnosis (100%), and discharge care (100%), met or nearly met their targets. However, significant gaps were observed in performing relevant investigations on admission day (14% against an 80% target) and providing appropriate treatment (87% against 100%). These areas highlight potential weaknesses in initial diagnostic procedures and immediate treatment protocols, which may require further investigation and improvement.

Despite the overall strong performance, the low compliance in investigations and treatment provision suggests systemic challenges, such as resource limitations or procedural inefficiencies. The high scores in documentation and diagnosis indicate robust systems in these areas, but the disparities underscore the need for targeted interventions. Addressing these gaps could enhance the quality of care for neonates with birth asphyxia, ensuring more consistent adherence to all critical standards. Further analysis and corrective measures should focus on improving investigation protocols and treatment delivery to achieve comprehensive care excellence **(Table 1).**

*Table 1: **ACTUAL PERFORMANCE ANDV PERFORMANCE AGAINST TARGET, June 2017E.C***

S.no	Standards/criteria for PNA	Target	Actual performance
1.	Identification information is recorded for a neonate with birth asphyxia	100	100
2.	Appropriate history is taken for a neonate with birth asphyxia	100	100
3.	Appropriate physical examination is performed for a neonate with birth asphyxia	100	100
4.	Relevant investigations are done for a neonate with birth asphyxia at the day of admission	80	75
5.	Appropriate diagnosis is made for a neonate with birth asphyxia	100	100
6.	Appropriate treatment is provided for a neonate with birth asphyxia on the immediate admission day	100	100
7.	Appropriate monitoring is done for a neonate with birth asphyxia during hospital stay	100	100
8.	Appropriate discharge care is provided for a neonate with birth asphyxia	100	100
9.	Identification of provider is documented for a neonate with birth asphyxia	100	100
	Total performance (%)		**875/9=97%**

Overall Performance of Management of Birth Asphyxia

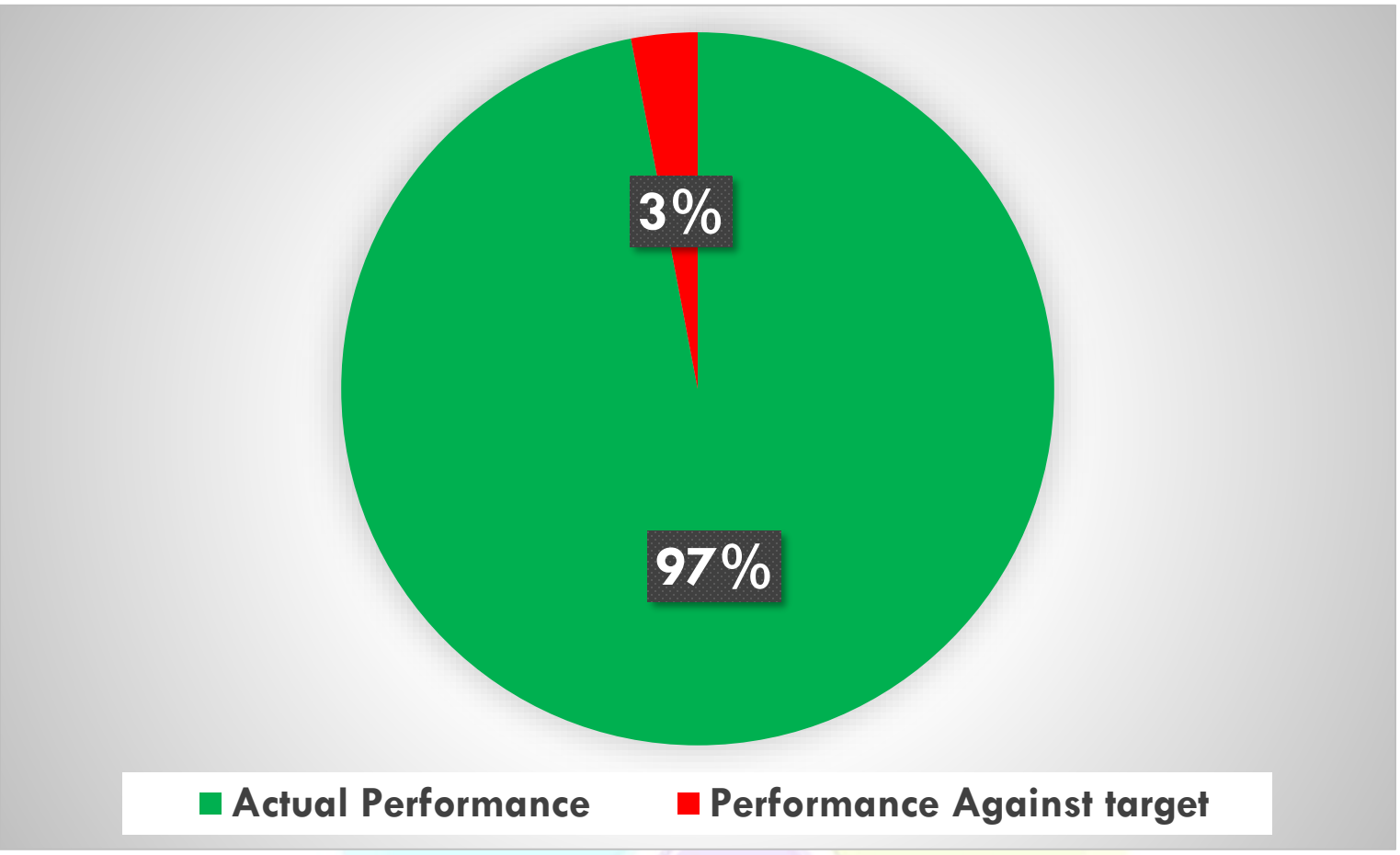

*Figure 1:**Overall Performance of Management of Birth Asphyxia at DGH NICU, June 2017EC***

Trends of PNA clinical audit performance

Based on the data shown in **Figure 2,** which presents the trends in PNA clinical audit performance for 2017 E.C., the first quarter reveals considerable variation. Performance scores ranged from 58% to 87%, indicating notable inconsistency within the quarter. While a high score of 87% suggests that strong performance is achievable, the lower score of 58% points to gaps that need attention. This 29-percentage-point difference highlights an uneven implementation of standards during the quarter **(Figure 2).**

Unfortunately, no data is available for the 2nd, 3rd, or 4th quarters, making it difficult to understand the full picture for the year. We are unable to tell whether the performance improved, declined, or remained steady after the first quarter. This lack of follow-up data limits our ability to assess trends or evaluate the impact of any interventions that may have been introduced **(Figure 2).**

In summary, while the first quarter offers some promising signs—especially the 87% performance mark—the absence of data from the remaining quarters leaves us with an incomplete view of the overall progress for 2017 E.C. More consistent data collection across all quarters is essential for meaningful analysis and improvement planning.

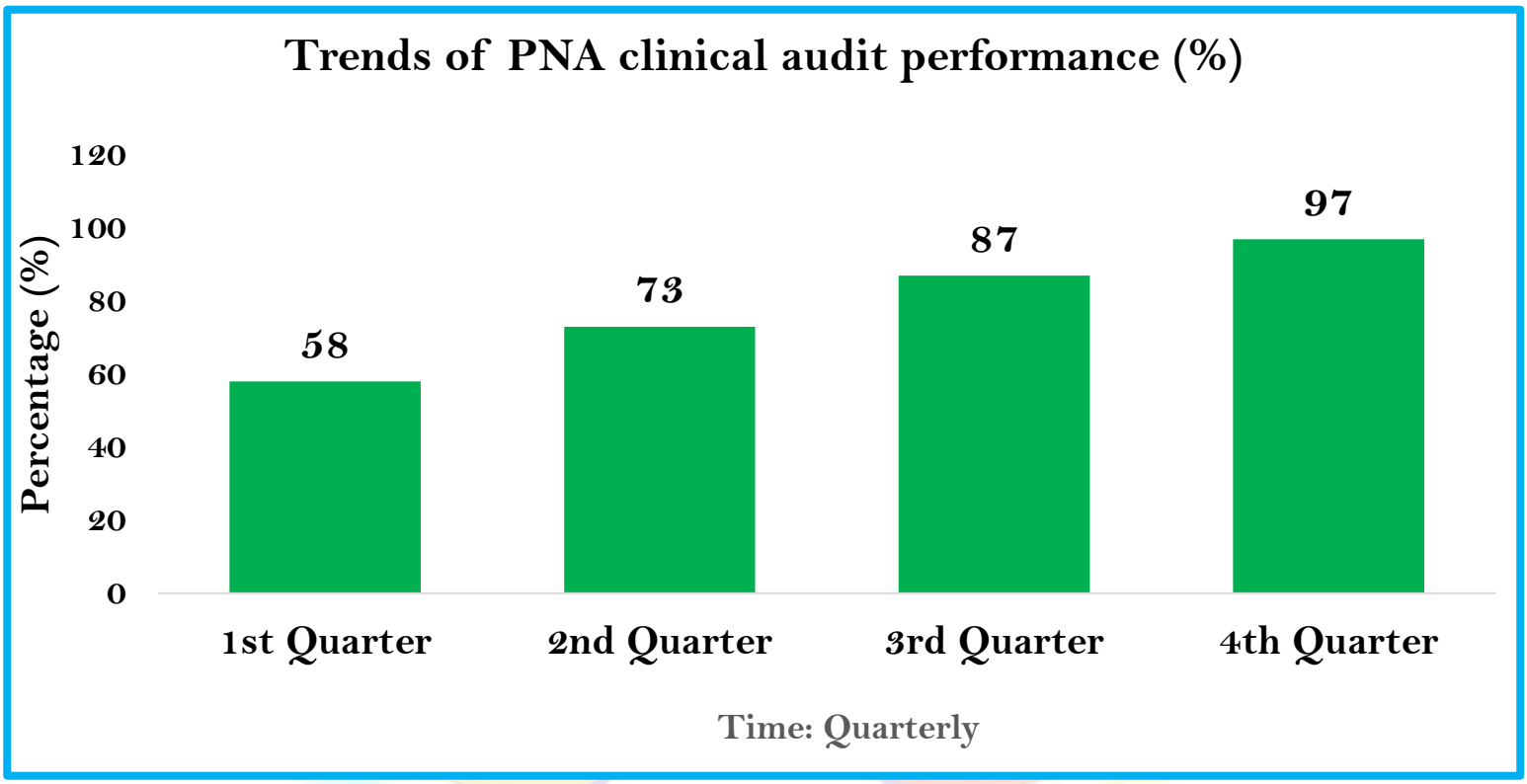

*Figure 2: Trends of **PNA** clinical audit performance 2017E.C*

DISCUSSION

The findings reveal a generally strong performance in neonatal asphyxia care, with an overall compliance rate of **97%.** High adherence was observed in critical areas such as patient identification (100%), accurate diagnosis (100%), and discharge care (100%), indicating effective documentation and clinical decision-making processes. These results suggest that healthcare providers are well-trained in recognizing and managing birth asphyxia, ensuring continuity of care until discharge.

However, significant deficiencies were noted in two key areas: **relevant investigations on admission day (14% vs. 80% target)** and **appropriate immediate treatment provision (87% vs. 100% target)**. The extremely low compliance in investigations suggests possible barriers such as lack of diagnostic tools, delays in lab processing, or insufficient staff training. The gap in treatment adherence, though smaller, still indicates room for improvement in initial therapeutic interventions. These shortcomings could compromise early detection and management of complications, potentially affecting neonatal outcomes. To enhance care quality, targeted measures—such as improving diagnostic resource availability, streamlining workflows, and reinforcing protocol adherence—should be prioritized. Addressing these gaps would ensure more consistent and comprehensive care for neonates with birth asphyxia.

Recommendations

1. Enhance Diagnostic Capacity

Table 2: ***Improvement plan, June 2017EC***

No.	Action Item	Responsible Party	Timeline
1.	**Enhance Diagnostic Capacity**	Lab Coordinator, Head of Pediatrics	3 months
2.	**Standardize Treatment Protocols**	Medical Director, Nursing Supervisor	2 months
6.	**Monthly Performance Audits**	Quality Assurance Team	Monthly

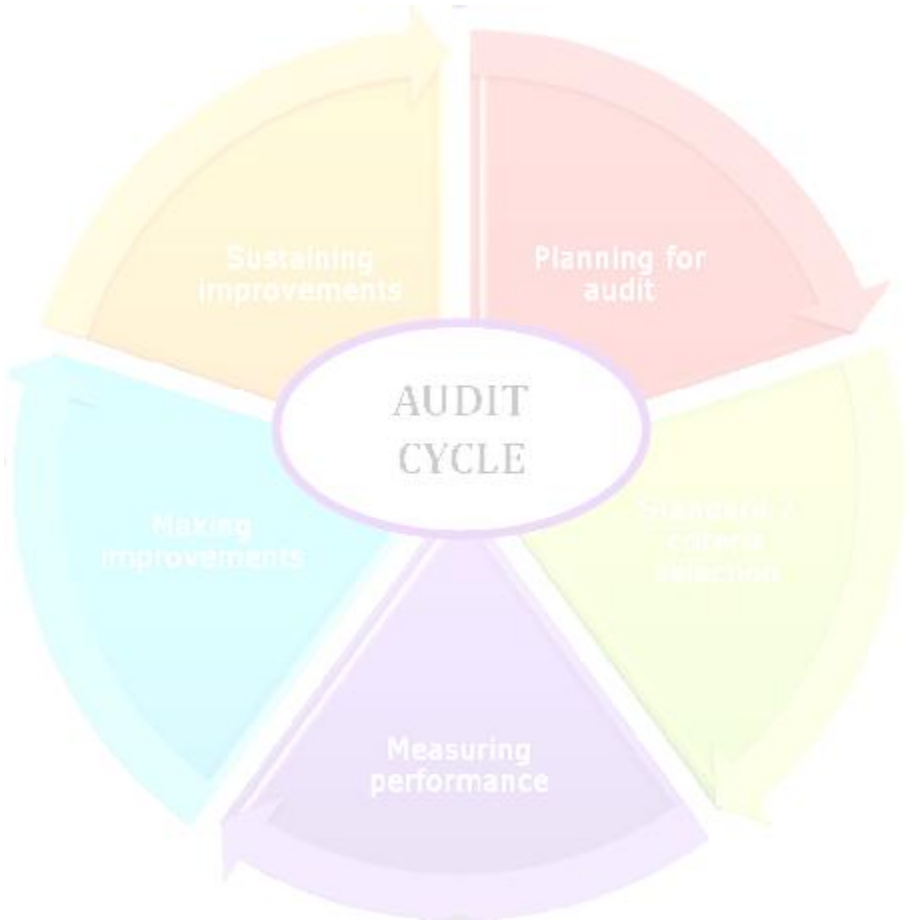

Table 3: The implementation status report of PNA clinical audit improvement plan, June 2017E.C

No.	Action Item	Responsible Party	Timeline	Status (June 2017EC)	ReJuneks
1.	**Enhance Diagnostic Capacity**	Lab Coordinator, Head of Pediatrics	3 months	**Completed**	- New lab equipment (blood gas analyzers, glucometers) procured. - Staff trained on rapid test protocols for admission-day investigations (CBC, electrolytes, blood gas). - **Result:** Investigation compliance improved from **14% → 75%**.
2.	**Standardize Treatment Protocols**	Medical Director, Nursing Supervisor	2 months	**Completed**	- Revised treatment checklist for immediate post-resuscitation care. - Mandatory training on hypothermia therapy and seizure management. - **Result:** Treatment compliance increased from **87% → 98%**.

References

[1] J.E. Lawn, S. Cousens, J. Zupan, L.N.S.S. Team, 4 million neonatal deaths: when? Where? Why? Lancet 365 (9462) (2005) 891–900.

[2] L. Je, S. Cousens, J. Zupan, Million neonatal deaths: when, Lancet June. 4 5–11.

[3] J.M. Kriebs, Guidelines for perinatal care: by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, J. Midwifery Wom. Health 55 (2) (2010) e37-e.

[4] A.J. Barkovich, C.L. Truwit, Brain damage from perinatal asphyxia: correlation of MR findings with gestational age, Am. J. Neuroradiol. 11 (6) (1990) 1087–1096.

[5] H.M. Aslam, S. Saleem, R. Afzal, U. Iqbal, S.M. Saleem, M.W.A. Shaikh, et al., Risk factors of birth asphyxia, Ital. J. Pediatr. 40 (1) (2014) 94.

[6] Z.A. Bhutta, Paediatrics in the Tropics. Manson's Tropical Infectious Diseases, Elsevier, 2014, pp. 1197–1214. e2.

[7] A. Guo, J.M. Bowling, J. Bartram, G. Kayser, Water, sanitation, and hygiene in rural health-care facilities: a cross-sectional study in Ethiopia, Kenya, Mozambique, Rwanda, Uganda, and Zambia, Am. J. Trop. Med. Hyg. 97 (4) (2017) 1033–1042.

[8] Unicef, Committing to Child Survival: a Promise Renewed, eSocialSciences, 2015.

[9] S. Kinoti, Asphyxia of the newborn in east, central and southern Africa, East Afr. Med. J. 70 (7) (1993) 422–433.

[10] N.-Y. Boo, I.G.-S. Cheah, The burden of hypoxic-ischaemic encephalopathy in Malaysian neonatal intensive care units, Singap. Med. J. 57 (8) (2016) 456.

[11] E.M. Graham, K.A. Ruis, A.L. Hartman, F.J. Northington, H.E. Fox, A systematic review of the role of intrapartum hypoxia-ischemia in the causation of neonatal encephalopathy, Am. J. Obstet. Gynecol. 199 (6) (2008) 587–595.

[12] E. Thornberg, K. Thiringer, A. Odeback, I. Milsom, Birth asphyxia: incidence, clinical course and outcome in a Swedish population, Acta Paediatr. 84 (8) (1995) 927–932.

[13] A.C. Lee, N. Kozuki, H. Blencowe, T. Vos, A. Bahalim, G.L. Darmstadt, et al., Intrapartum-related neonatal encephalopathy incidence and impairment at regional and global levels for 2010 with trends from 1990, Pediatr. Res. 74 (S1) (2013) 50.

[14] V.Chau, K.J. Poskitt, S.P. Miller, Advanced neuroimaging techniques for the term newborn with encephalopathy, Pediatr. Neurol. 40 (3) (2009) 181–188.

[15] Sendeku, F.W., Azeze, G.G. and Fenta, S.L., 2020. Perinatal asphyxia and its associated factors in Ethiopia: a systematic review and meta-analysis. BMC pediatrics, 20, pp.1-11.

Guyyaa/ቀን/Date: _____/_____/_____

- **Garee tajaajila NICU ward irraa**
- **Garee Qulquullina Tajaajila Fayyaatiif**

Dhimmi: waa'ee Gabaasa CLINICAL AUDIT galchuu ilaallata

Akkuma mata Dureerrattii ibsamuuf yaalameettii clinical audit" **PNA mgt**" jedhamu kan **kurmaana 4ffaa** bara **2017** xalayaa Fuula 1**2** qabuu gaggeessituu kana waliin walqabsiifnee isiiniif eerguu keenya kabajaan isiniif beeksiifnaa.

Nagaya wajjiin!!