

Standards for improving the quality of care for small and sick newborns in health facilities



Standards for improving the quality of care for small and sick newborns in health facilities



Standards for improving quality of care for small and sick newborns in health facilities

ISBN 978-92-4-001076-5 (electronic version)

ISBN 978-92-4-001077-2 (print version)

© World Health Organization 2020

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

Under the terms of this licence, you may copy, redistribute and adapt the work for non-commercial purposes, provided the work is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that WHO endorses any specific organization, products or services. The use of the WHO logo is not permitted. If you adapt the work, then you must license your work under the same or equivalent Creative Commons licence. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: "This translation was not created by the World Health Organization (WHO). WHO is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition".

Any mediation relating to disputes arising under the licence shall be conducted in accordance with the mediation rules of the World Intellectual Property Organization (<http://www.wipo.int/amc/en/mediation/rules/>).

Suggested citation. Standards for improving quality of care for small and sick newborns in health facilities. Geneva: World Health Organization; 2020. Licence: **CC BY-NC-SA 3.0 IGO**.

Cataloguing-in-Publication (CIP) data. CIP data are available at <http://apps.who.int/iris>.

Sales, rights and licensing. To purchase WHO publications, see <http://apps.who.int/bookorders>. To submit requests for commercial use and queries on rights and licensing, see <http://www.who.int/about/licensing>.

Third-party materials. If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

General disclaimers. The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by WHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall WHO be liable for damages arising from its use.

Design by Inis Communication

Contents

Acknowledgements.....	iv
Definitions and terms.....	v
1. Summary of standards.....	1
2. Introduction.....	11
3. Framework for improving the quality of care of small and sick newborns.....	13
4. Definitions and structure of the standards.....	15
5. Purpose and application of the standards.....	17
6. Development of the standards.....	19
Standard 1: Evidence-based practices for routine care and management of complications.....	25
Standard 2: Actionable health information systems.....	73
Standard 3: Functioning referral systems.....	77
Standard 4: Effective communication and meaningful participation.....	87
Standard 5: Respect, protection and fulfilment of newBorns' rights and preservation of dignity.....	97
Standard 6: Emotional, psychosocial and developmental support.....	105
Standard 7: Competent, motivated, empathetic, multidisciplinary human resources.....	117
Standard 8: Essential physical resources for small and sick newborns available.....	125
Annex 1. Participants in the informal consultation on human rights in newborn care, Geneva, 9 April 2019.....	137
Annex 2. Participants in the technical meeting on standards of care for small and sick newborns, Geneva, 10–12 April 2019.....	138
Annex 3. Contributors to consultations on quality measures	139

Acknowledgements

The WHO Department of Maternal, Newborn, Child and Adolescent Health and Ageing gratefully acknowledges the contributions of many individuals and organizations to the preparation of this document.

Special thanks go to the experts who participated in and contributed to the framework for the quality of care for small and sick newborns, the rights of the newborn, standards of care and quality statements through online consultations and at a technical meeting in April 2019: Samira Aboubaker, Elena Ateva, Amina Barakat, Nelan Bhardway, Nancy Bolan, Nathalie Charpak, Andrew Clarke, Louise-Tina Day, Ashok Deorari, Queen Dube, Laura Ferguson, Anne Grandjean, Imma Guerras Delgado, Tedbabe Hailegabriel, Lily Kak, Neena Khadka, Catherine Kirk, Marzia Lazzerini, Jim Litch, Carolyn MacLennan, Silke Mader, Arti Maria, Socorro Mendoza, Benyam Mezmur, Sarah Moxon, Georgina Murphy, Karen New, Assaye Nigussie, Jesca Nsungwa-Sabiiti, Sue Prullage, Anu Sachdeva, Emma Sacks, Isabella Sagoe-Moses, Manuel Sanchez Luna, Theresa Shaver, Nalini Singhal, Merran Thomson, Karen Walker, Steve Wall, Charlotte Warren, Bjorn Westrup, Bogale Worku and Nabila Zaka.

We acknowledge the contributions of 40 experts in 19 countries who provided input to building consensus on the quality measures (listed in Annex 3).

External consultants who supported the work at various stages are Carolyn MacLennan and Laura Ferguson.

Anshu Banerjee, Bernadette Daelmans, Ornella Lincetto, Allisyn Moran, Moise Muzigaba, Marcus Stahlhofer and Wilson Were were members of the WHO Steering Group that managed development of the standards.

We appreciate the feedback provided by all Every Newborn Action Plan partners, WHO staff in headquarters, regions and countries who participated in meetings, reviewed the text and provided input.

We acknowledge and thank the United States Agency for International Development for financial support for this work.

Definitions and terms

Carer, caregiver	Parent, family member or any other person responsible for the care of a child.
Child	A person under the age of 18 years.
Developmental supportive care	A broad category of interventions designed to minimize the stress of a neonatal intensive care unit. Strategies include control of external stimuli (vestibular, auditory, visual, tactile), clustering of nursery care activities and minimal handling, intentional positioning (nesting, prone position, swaddling) and protection of sleep.
Emergency care area	A designated room or unit in a facility where immediate care and resuscitation are provided for severe or sudden illness, trauma or injury.
Family	In this document, “family” is broadly construed to comprise relatives by blood, adoption or marriage and members of the same household.
Family-centred care	An approach to health care that is respectful of and responsive to individual families’ needs and values. ¹ The eight principles for patient-centred and family-centred care for newborns in a neonatal intensive care unit are: parental access with no limitation due to staff shift or medical rounds, psychological support for parents, pain management, a supportive environment, parental support, skin-to-skin contact, support for breastfeeding and lactation and protection of sleep. ²
Guideline	Rule or instruction on the best way of doing something.
Health professional or provider	A trained individual with knowledge and skills to provide preventive, curative, promotional or rehabilitative health care in a systematic way to people, families and communities. They include doctors, nurses, midwives, pharmacists and paramedical staff.
Infant	A child < 1 year of age.
Kangaroo mother care	Early, continuous, prolonged skin-to-skin contact between a mother and her newborn, frequent and exclusive breastfeeding and early discharge from hospital.
Newborn	Infant < 1 month of age (neonate).
Protocol	A set of rules/procedures to be followed when giving medical treatment.
Quality measure	Criterion for assessing, measuring and monitoring the quality of care as specified in a quality statement.
Quality statement	A concise statement of what is required to ensure measurable quality of care.
Sick newborn	Newborn with any medical or surgical condition.
Small newborn	Newborn weighing < 2500 g at birth (includes preterm and low-birth-weight newborns).
Standard	A general statement of what is expected to be provided to ensure high-quality care for newborns.
Standard operating procedure	Established or prescribed method to be followed routinely in the performance of designated operations or in designated situations.
Young infant	Infant < 2 months of age.

¹ Davidson JE, Aslakson RE, Long AC, Puntillo KA, Kross EK, Hart J, et al. Guidelines for family-centered care in the neonatal, pediatric, and adult ICU. *Crit Care Med*. 2017;45(1):103–28.

² Roué JM, Kuhn P, Lopez Maestro M, Maastrup RA, Mitancher D, Westrup B, et al. Eight principles for patient-centred and family-centred care for newborns in the neonatal intensive care unit. *Arch Dis Child Fetal Neonat*. 2017;102:F364–8.



1. Summary of standards

The standards for the care of small and sick newborns in health facilities define, standardize and mainstream inpatient care of small and sick newborns, building on essential newborn care and ensuring consistency with the WHO quality of care framework. The standards will guide countries in caring for this vulnerable population and support the quality of care of newborns in the context of universal health coverage. They will provide a resource for policy-makers, health care professionals, health service planners, programme managers, regulators, professional bodies and technical partners involved in care, to help plan, deliver and ensure the quality of health services.

STANDARDS

1. Evidence-based practices

Every small and sick newborn receives evidence-based routine care and management of complications according to WHO guidelines.

.....

2. Actionable information systems

The health information system enables collection, analysis and use of data to ensure early, appropriate action to improve the care of every small and sick newborn.

.....

3. Functioning referral systems

Every small and sick newborn with a condition(s) that cannot be managed effectively with available resources receives appropriate, timely referral through integrated newborn service pathways with continuity of care, including during transport.

.....

4. Effective communication and meaningful participation

Communication with small and sick newborns and their families is effective, with meaningful participation, and responds to their needs and preferences, and parental involvement is encouraged and supported throughout the care pathway.

.....

5. Respect, protection and fulfilment of newborn rights and preservation of dignity

Newborns' rights are respected, protected and fulfilled, without discrimination, with preservation of dignity at all times and in all settings during care, transport and follow-up.

.....

6. Emotional, psychosocial and developmental support

All small and sick newborns are provided with family-centred developmental supportive care and follow-up, and their families receive emotional and psychosocial support that is sensitive to their needs and strengthens their capability.

.....

7. Competent, motivated, empathetic multi disciplinary human resources

For every small and sick newborn, competent, motivated, empathetic, multidisciplinary staff are consistently available to provide routine care, manage complications and provide developmental and psychological support throughout the care pathway.

.....

8. Essential physical resources for small and sick newborns

The health facility has an appropriate physical environment, with adequate water, sanitation, waste management, energy supply, medicines, medical supplies and equipment for routine care and management of complications in small and sick newborns.

.....



STANDARD 1:

Every small and sick newborn receives evidence-based routine care and management of complications according to WHO guidelines.

Quality statements

A. Care for all newborns

- 1.1** All newborns receive care with standard precautions to prevent health care-associated infections, including implementing additional measures required during outbreaks and pandemic situations.
- 1.2** All newborns are assessed immediately while receiving essential newborn care.
- 1.3** NEW: All newborns at risk are correctly identified as soon as possible after birth or on presentation to the health facility and receive additional care.
- 1.4** All referred newborns are triaged, promptly assessed for danger signs or injuries to determine whether they require resuscitation and receive appropriate care according to WHO guidelines.
- 1.5** All newborns receive routine postnatal care, including weighing and temperature measurement.
- 1.6** All newborns are assessed for immunization status and receive recommended vaccinations according to the guidelines of the WHO Expanded Programme on Immunization.
- 1.7** NEW: All newborns are given vitamin K according to WHO guidelines.
- 1.8** All newborns are protected from unnecessary or harmful practices, including separation from their mothers and families during their care.
- 1.9** All newborns are screened for evidence of maltreatment, including neglect and violence, and receive appropriate care.
- 1.10** NEW: All newborns are assessed for congenital abnormalities, managed appropriately and referred in a timely manner.
- 1.11** NEW: All newborns whose gestational age is unknown are assessed with an appropriate tool for scoring gestational age.

- 1.12** All newborns are assessed for suspected infection or risk factors for infection and, if required, investigated and given the correct antibiotic treatment according to WHO guidelines, avoiding overuse of antibiotics.
- 1.13** NEW: All newborns at risk of congenital syphilis are assessed, investigated and managed according to WHO guidelines.
- 1.14** NEW: All newborns receive eye prophylaxis, are assessed for ophthalmia neonatorum and, if required, managed according to WHO guidelines.
- 1.15** All newborns at risk for tuberculosis and/or HIV infection are correctly assessed, investigated and managed appropriately according to WHO guidelines.
- 1.16** NEW: All newborns at risk of impaired metabolic adaptation associated with asphyxia, small-for-gestational age and maternal diabetes are assessed to identify and manage hypoglycaemia.

B. Care for small and sick newborns

B1. Care for respiratory conditions

- 1.17** NEW: Small and sick newborns are assessed for signs of respiratory compromise, and a neonatal pulse oximeter is used to detect hypoxia or hyperoxia and to guide administration of supplemental oxygen according to WHO guidelines.
- 1.18** NEW: Preterm newborns born at or before 32 weeks of gestation who require respiratory support are given between 21% (air) and 30% oxygen, and the need for increasing oxygen concentrations is reviewed to ensure oxygen saturation between 90% and 95%.
- 1.19** NEW: Small and sick newborns who require supplemental oxygen therapy receive it safely through appropriate neonatal equipment, including neonatal nasal prongs, low-flow meters, air-oxygen blenders, humidifiers and a pulse oximeter.
- 1.20** NEW: Small and sick newborns are assessed and managed for apnoea, and preterm newborns are managed to prevent apnoea according to WHO guidelines.
- 1.21** NEW: Newborns with respiratory distress are treated with continuous positive airway pressure as soon as the diagnosis is made, according to WHO guidelines.
- 1.22** NEW: Small and sick newborns are assessed for surfactant deficiency, and surfactant replacement therapy is administered to preterm newborns within the first 2 hours of birth according to WHO guidelines.
- 1.23** NEW: Small and sick newborns at risk of bronchopulmonary dysplasia are assessed, investigated and managed as per standard guidelines.

B2. Nutritional support for newborns

- 1.24** NEW: Small and sick newborns are fed appropriately, including assisted feeding with the mother's milk when possible, according to WHO guidelines.

- 1.25** NEW: Small and sick newborns who cannot tolerate enteral feeding or for whom enteral feeding is contraindicated are provided with parenteral nutrition in correct amounts and composition according to standard guidelines.
- 1.26** NEW: All newborns of HIV-infected mothers are fed appropriately according to WHO guidelines.
- 1.27** NEW: All very-low-birth-weight newborns are given vitamin D, calcium, phosphorus and iron supplements according to WHO guidelines.

B3. Care for other conditions

- 1.28** NEW: All newborns are routinely monitored for jaundice; bilirubin is measured in those at risk and treatment initiated in those with hyperbilirubinaemia according to WHO guidelines.
- 1.29** NEW: Small and sick newborns are assessed and managed for seizures according to WHO guidelines.
- 1.30** NEW: Small and sick newborns at risk for neonatal encephalopathy receive early evaluation, close monitoring and appropriate management according to WHO guidelines.
- 1.31** NEW: All newborns are assessed and managed for anaemia, including for causes of haemolytic disease of the newborn.
- 1.32** NEW: Small and sick newborns at risk of necrotizing enterocolitis are assessed and managed according to WHO guidelines.
- 1.33** NEW: Small and sick newborns at risk of retinopathy of prematurity are appropriately identified, screened and treated.
- 1.34** NEW: Small and sick newborns at risk of intraventricular haemorrhage are assessed and managed according to standard guidelines.
- 1.35** All referred newborns with surgical conditions are screened for surgical emergencies and injury and receive appropriate surgical care.

B4. Clinical monitoring and supportive care

- 1.36** Small and sick newborns, especially those who are most seriously ill, are adequately monitored, appropriately reassessed and receive supportive care according to WHO guidelines.
- 1.37** NEW: Small and sick newborns are given antibiotics and other medications only if indicated, by the correct route and of the correct composition; the dose is calculated, checked and administered, the need for medication is regularly reassessed, and any adverse reaction is appropriately managed and recorded.
- 1.38** NEW: Small and sick newborns who cannot tolerate full enteral feeds are given intravenous fluids containing glucose or safe, appropriate parenteral nutrition; fluids are administered through an infusion pump and a neonatal burette, the volume is recorded, and the intravenous site is checked with other routine observations.
- 1.39** NEW: Small and sick newborns are given blood transfusions when indicated, the blood given is appropriate, the volume is recorded, and the newborn is monitored before, during and after the transfusion.

B5. Pain management and palliative care for newborns

- 1.40** All small and sick newborns are assessed routinely for pain or symptoms of distress and receive appropriate management according to WHO guidelines.
- 1.41** NEW: Small and sick newborns have access to appropriate palliative care.

B6. Care and advice at discharge

- 1.42** NEW: Small and sick newborns are discharged from hospital when home care is considered safe and carers have received a comprehensive discharge management plan and are competent in the care of their newborn.



STANDARD 2:

The health information system enables collection, analysis and use of data to ensure early appropriate action to improve the care of every small and sick newborn.

Quality statements

- 2.1** Every small and sick newborn has a complete, accurate, standardized, up-to-date medical record, which is accessible throughout their care, on discharge and on follow-up.
- 2.2** Every health facility has a functional mechanism for collecting, analysing and using data on newborns as part of monitoring performance and quality improvement.
- 2.3** Every health facility has a mechanism for collecting, analysing and providing feedback on the newborn services provided and the perceptions of families of the care received.



STANDARD 3:

Every small and sick newborn with a condition or conditions that cannot be managed effectively with available resources receives appropriate, timely referral through integrated newborn service pathways with continuity of care, including during transport.

Quality statements

- 3.1** Every small and sick newborn who requires referral receives appropriate pre-referral care, and the decision to refer is made without delay.

- 3.2 Every small and sick newborn who requires referral receives seamless, coordinated care and referral according to a plan that ensures timeliness.
- 3.3 For every newborn referred or counter-referred within or between health facilities, there is appropriate information exchange and feedback to relevant health care staff.
- 3.4 NEW: Every health facility that provides care for small and sick newborns has been designated according to a standard level of care and is part of an integrated newborn network with clear referral pathways, a coordinating referral centre that provides clinical management support, protocols and guidelines.
- 3.5 NEW: Newborn transfer services provide safe, efficient transfer to and from referral neonatal care by experienced, qualified personnel, preferably specialist transport teams, in specialist transport vehicles.
- 3.6 NEW: Every newborn who requires referral is transferred in the kangaroo mother care position with their mother, when possible.



STANDARD 4:

Communication with small and sick newborns and their families is effective, with meaningful participation, and responds to their needs and preferences, and parental involvement is encouraged and supported throughout the care pathway.

Quality statements

- 4.1 All carers of small and sick newborns are given information about the newborn's illness and care, so that they understand the condition and the necessary treatment.
- 4.2 All small and sick newborns and their carers experience coordinated care, with clear, accurate information exchange among relevant health and social care professionals and other staff.
- 4.3 All carers are enabled to participate actively in the newborn's care through family-centred care and kangaroo mother care, in decision-making, in exercising the right to informed consent and in making choices.
- 4.4 NEW: Carers of small and sick newborns and staff understand the importance of nurturing interaction with the newborn, recognize and respect the newborn's behaviour and cues, and include them in care decisions.
- 4.5 NEW: All carers receive appropriate counselling and health education about the current illness of the newborn, transition to kangaroo mother care follow-up, community care and continuous care, including early intervention and developmental follow-up.
- 4.6 NEW: In humanitarian and fragile settings, including outbreak and pandemic situations, special consideration is given to the specific psychosocial and practical needs of small and sick newborns and their carers.



STANDARD 5:

Newborns' rights are respected, protected and fulfilled without discrimination, with preservation of dignity at all times and in all settings during care, transport and follow-up.

Quality statements

- 5.1** All newborns have equitable access to health care services, with no discrimination of any kind.
- 5.2** The carers of all newborns are made aware of and given information about the newborn's rights to health and health care.
- 5.3** All newborns and their carers are treated with respect and dignity, and their right to privacy and confidentiality is respected.
- 5.4** All newborns are protected from any physical or mental violence, injury, abuse, neglect or any other form of maltreatment.
- 5.5** NEW: All newborns have their birth registered and have an identity.
- 5.6** NEW: All newborns who die and all stillbirths have their death registered.



STANDARD 6:

All small and sick newborns are provided with family-centred developmental supportive care and follow-up, and their families receive emotional and psychosocial support that is sensitive to their needs and strengthens their capability.

Quality statements

- 6.1** All small and sick newborns stay with their carers, with minimal separation, and the role of carers is recognized and supported at all times during care, including rooming-in during hospitalization.
- 6.2** NEW: All newborns born preterm or with a low birth weight receive kangaroo mother care as soon as possible after birth, and the parents are supported in its provision.
- 6.3** NEW: All small and sick newborns receive appropriate developmental supportive care, and their families are recognized as partners in care.
- 6.4** NEW: All families receive care in an environment in which their socioeconomic, emotional and cultural needs are respected and supported.
- 6.5** NEW: All small and sick newborns receive appropriate, coordinated developmental follow-up with minimal disruption to family life and routines.



STANDARD 7:

For every small and sick newborn, competent, motivated, empathetic, multidisciplinary staff are consistently available to provide routine care, manage complications and provide developmental and psychological support throughout the care pathway.

Quality statements

- 7.1** All small and sick newborns have access to a sufficient multidisciplinary workforce, including health professionals, allied health and support staff, at all times according to standard levels of care.
- 7.2** Health professionals and allied health and support staff have appropriate skills to support the health and the psychological, developmental, communication and cultural needs of newborns and their families.
- 7.3** NEW: All staff working in neonatal units of a health facility have the necessary knowledge, skills and attitudes to provide infection prevention and control, basic resuscitation, kangaroo mother care, safe feeding and medications and positive interaction with newborns and communication with carers.
- 7.4** Every health facility that provides care for small and sick newborns has managerial leadership for developing and implementing policies and legal entitlements, clinical governance and fostering an environment for continuous quality improvement.



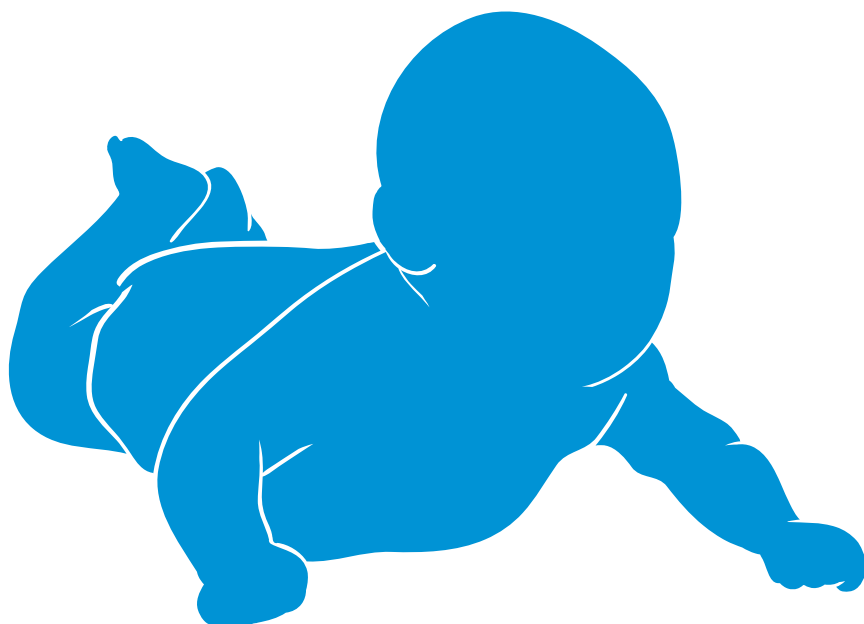
STANDARD 8:

The health facility has an appropriate physical environment, with adequate water, sanitation, waste management, energy supply, medicines, medical supplies and equipment for routine care and management of complications in small and sick newborns.

Quality statements

- 8.1** Small and sick newborns are cared for in a safe, secure, well-maintained, organized physical environment that is appropriately designed to provide kangaroo mother care and family-centred care according to standard levels.
- 8.2** Water, sanitation, hand hygiene and waste disposal facilities are easily accessible, functional, reliable, safe and sufficient to ensure strict infection control and meet the needs of newborns, carers and staff.
- 8.3** Equipment designed specifically for the medical care and developmental and emotional support of small and sick newborns is available at all times.

- 8.4 Adequate stocks of medicines and medical supplies specific for small and sick newborns are available for routine care and for management of complications.
- 8.5 NEW: All carers of small and sick newborns have a dedicated area with supportive elements, including adequate space for kangaroo mother care, family-centred care, privacy for mothers to express breast milk and facilities for hygiene, cooking and laundry.
- 8.6 NEW: In humanitarian and fragile settings, including outbreaks and pandemic situations, provision of a safe, secure environment for the care of small and sick newborns is included in preparedness, response and recovery plans.



2. Introduction

Newborns who are born too soon or too small or who become sick are at the greatest risk of death and disability. Each year, an estimated 2.5 million newborns die during the first 28 days of life, of whom approximately 80% had a low birth weight and two thirds were born prematurely. A further estimated 1 million small and sick newborns survive with a long-term disability. Globally, up to 30 million newborns require some level of inpatient care each year. These include newborns with complications of prematurity, intrapartum brain injury, severe bacterial infection or pathological jaundice and those with congenital conditions. Substantial human potential for lifelong health and well-being is lost through newborn mortality, disability and long-term disease.³

Improving the quality of care for women and children is a WHO priority for reducing preventable maternal, newborn and child deaths, and WHO has developed standards of care to guide the quality of care in countries. The new standards for improving the quality of care for small and sick newborns in health facilities described in this document form part of normative guidance for improving the quality of maternal, newborn, child and adolescent health care. In view of the importance of the continuum of both the life-course and service delivery,⁴ these standards build on the WHO *Standards for improving quality of maternal and newborn care in health facilities* (2016) and the WHO *Standards for improving the quality of care for children and young adolescents in health facilities* (2018).

High-quality care requires an integrated, resilient health system, multidisciplinary teams and innovation. Care for small and sick newborns should be organized by population size and need, with a network of facilities and connections among health system levels through functional referral systems. High-quality care requires investment in sufficient numbers of health care providers with the skills to care for small and sick newborns, particularly trained and motivated nurses, working in partnership with parents and families. Good-quality care services involve evidence-based practices; are well-organized, accessible and adequately resourced; are safe, efficient, equitable, timely and people-centred;⁵ and ensure optimal clinical, developmental and social outcomes for small and sick newborns.

³ UNICEF, WHO. *Survive and thrive: transforming care for every small and sick newborn*. Geneva: World Health Organization; 2019

⁴ Kerber KJ, de Graft-Johnson JE, Bhutta ZA, Okong P, Starrs A, Lawn JE. Continuum of care for maternal, newborn, and child health: from slogan to service delivery. *Lancet*. 2007;370:1358–69.

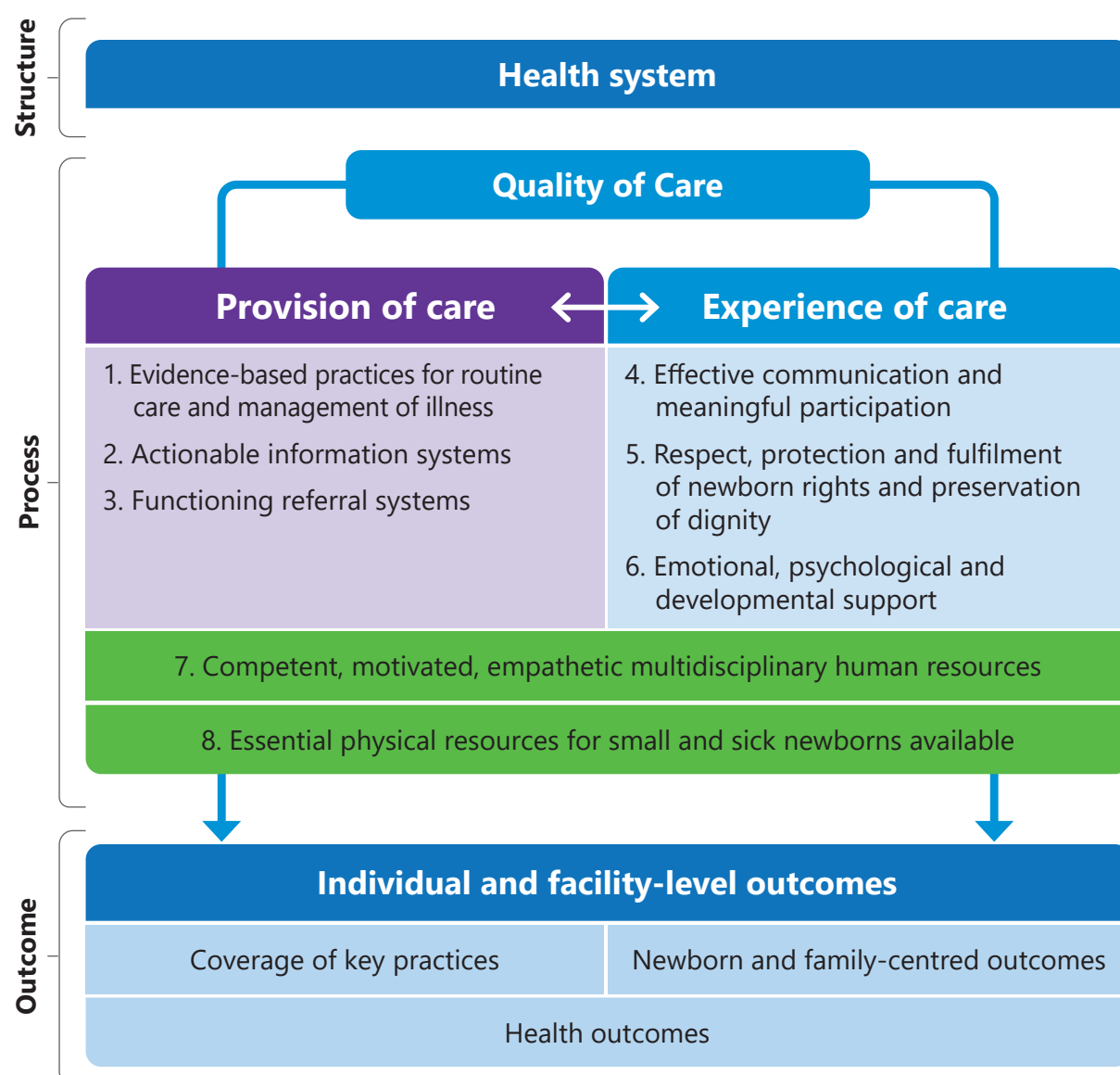
⁵ UNICEF, WHO. *Every newborn: an action plan to end preventable deaths*. Geneva: World Health Organization; 2014 (http://www.who.int/maternal_child_adolescent/newborns/every-newborn/en/).

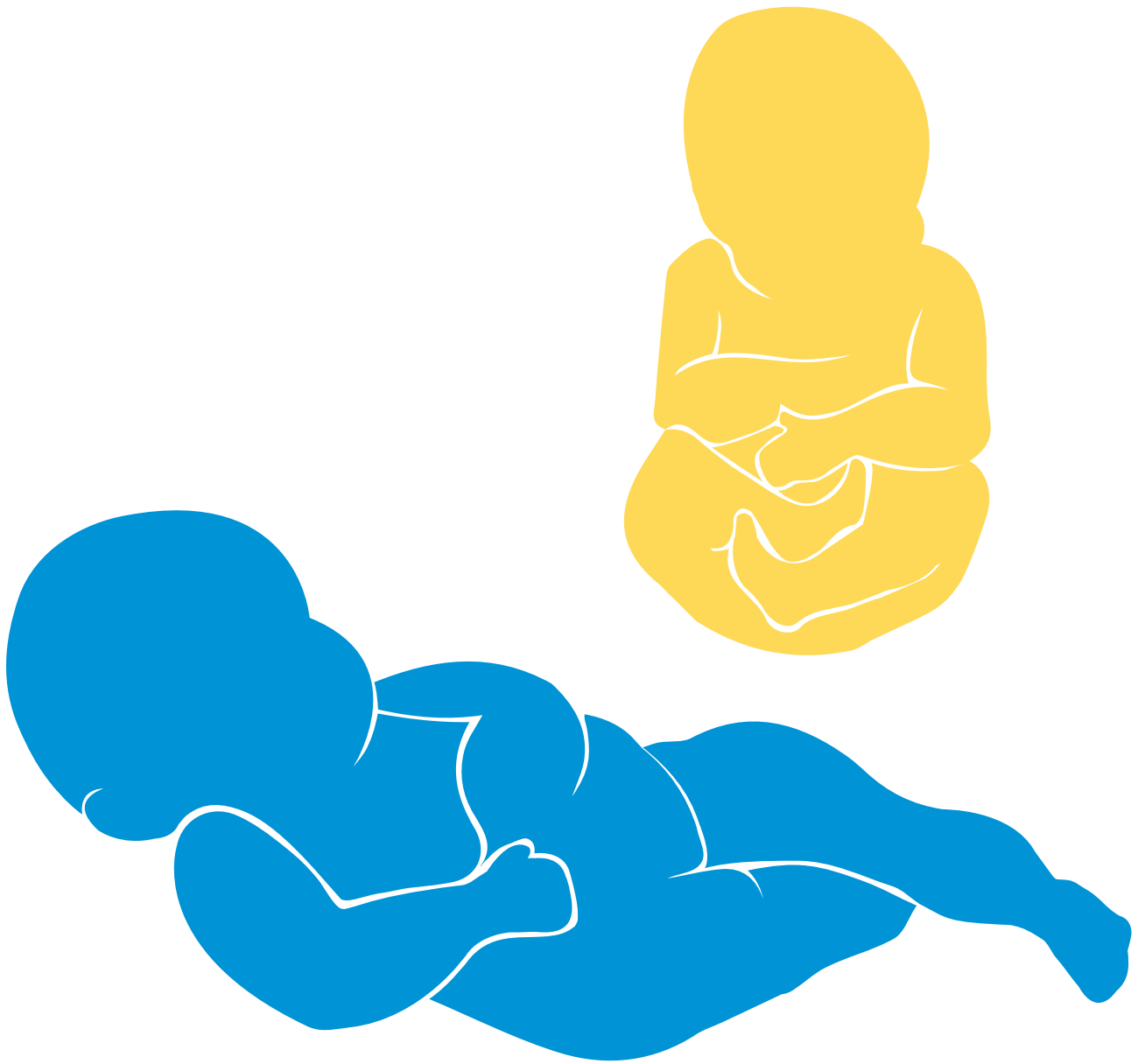


3. Framework for improving the quality of care of small and sick newborns

The aim of the framework, illustrated in Fig. 1, is to ensure specific care for small and sick newborns. It includes the newborn's right to health and recognition that their health and physical, psychosocial, developmental and communication needs are different from those of older children. The eight domains of the framework for improving the quality of care for children and young adolescents in health facilities have been modified to reflect the best interests of small and sick newborns. The domains of provision of care ensure that health facilities provide standardized levels of care within integrated newborn networks. The domains of experience of care have been modified to ensure that the care provided is family-centred and that the newborn is recognized as an active participant and is respected, protected and supported emotionally, psychologically and developmentally.

Fig. 1. Framework for improving the quality of care for small and sick newborns





4. Definitions and structure of the standards

Quality of care is “the extent to which health care services provided to individuals and patient populations improve desired health outcomes. In order to achieve this, health care must be safe, effective, timely, efficient, equitable and people-centred”.⁶

Standard of care is a general description of what is expected in order to ensure high-quality care for newborns in each domain of the framework. Each standard has two main components: quality statements and quality measures, adapted from the quality standards of the National Institute for Health and Care Excellence⁷ (Fig. 2).

“Quality statements” are concise statements of the priorities for measurably improving the quality of care for newborns. They define the markers of quality derived from evidence on the thematic area and the resources required.

“Quality measures” are criteria for assessing, measuring and measurably monitoring the quality of care as specified in the quality statement, in terms of input, process or output and outcome. Thus:

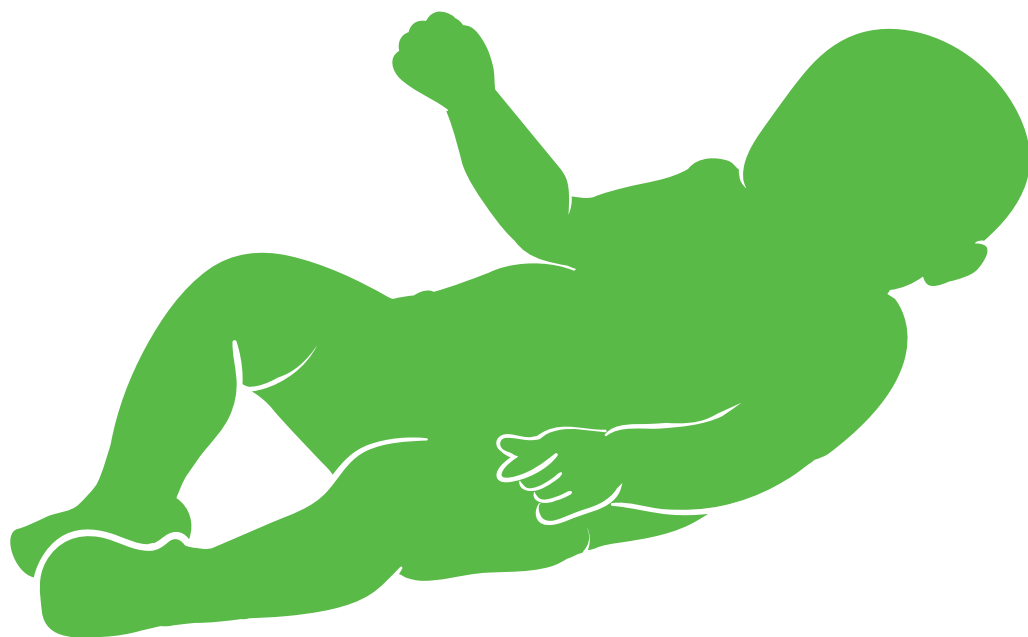
- input: what must be in place for the desired care to be provided (e.g. physical resources, human resources, policies, guidelines);
- process or output: whether the desired process of care was provided as expected; and
- outcome: the effect of the provision and experience of care on health and people-centred outcomes.

Fig. 2. Structure of the standards



⁶ Quality of care: a process for making strategic choices in health systems. Geneva: World Health Organization; 2006 (http://www.who.int/management/quality/assurance/QualityCare_B.Def.pdf?ua=1, accessed 28 July 2020).

⁷ Standards and indicators. London: National Institute for Health and Care Excellence; 2019 (<https://www.nice.org.uk/standards-and-indicators>, accessed 7 November 2019).



5. Purpose and application of the standards

The standards of care for small and sick newborns in health facilities define, standardize and mainstream inpatient care of these newborns, building on the essential newborn care platform and ensuring consistency with the WHO quality of care framework. The aim of the standards is to guide countries in caring for this vulnerable population and supporting the quality of care of newborns in the context of universal health coverage. They provide a resource for policy-makers, health care professionals, health service planners, programme managers, regulators, professional bodies and technical partners involved in care, to help plan, deliver and ensure the quality of neonatal health services. They do not replace clinical guidelines but provide guidance on the requirements for ensuring high-quality care in health facilities. The standards empower local teams to work effectively towards continuous quality improvement in newborn health.

The standards are consistent with newborn rights, as they recognize their specific needs and apply to all health facilities that provide newborn care. They build on the standards of care for mothers and newborns up to one week of life and the standards of care for children and young adults in health facilities. They include evidence-based practices for the prevention and management of newborn conditions.

The standards provide guidance for preparing national standards of care and protocols and organizing and planning the required services and resources (e.g. essential medicines and supplies, equipment and human resources). The measures identify what can be tracked and monitored to assess performance. WHO and partners are also working to improve the quality of care through the Network for Improving Quality of Care for Maternal, Newborn and Child Health (the Network).⁸ A monitoring framework has been developed that provides basic guidance for the Network and is aligned with the Network goals, strategic objectives, implementation framework and the WHO *Standards for improving quality of maternal and newborn care in health facilities* (2016) and the WHO *Standards for improving quality of care for children and young adolescents in health facilities* (2018). Further work specific to monitoring the quality of care for small and sick newborns is anticipated.

The aim of the standards is to support users in:

- determining what is expected and required to deliver effective, high-quality health services for small and sick newborns in health facilities;
- defining the priorities for improving the quality of care for newborns in health facilities;
- defining the best practices that will support improvement of the quality of care;
- providing the basis for assessing, auditing and monitoring improvements in the quality of care for facility accreditation and performance rewards; and
- achieving optimal outcomes for newborns and health facilities.

⁸ Quality, equity, dignity. A network for improving quality of care for maternal, newborn and child health. Quality of care for maternal and newborn health: a monitoring framework for network countries. Geneva: World Health Organization; 2019 (<https://www.who.int/docs/default-source/mca-documents/advisory-groups/quality-of-care/quality-of-care-for-maternal-and-newborn-health-a-monitoring-framework-for-network-countries.pdf>, accessed 29 July 2020).



6. Development of the standards

To develop standards specific for small and sick newborns, existing evidence, guidelines and standards of care were reviewed to identify shortcomings. The literature review covered all WHO guidelines and recommendations for evidence-based practices in newborn health, published literature on standards of care for small and sick newborns, international best practices, standards and guidelines and *Lancet* series on topics that included maternal, newborn and child health. The Cochrane Database of Systematic Reviews on neonatal health topics was reviewed, and the website of the National Institute for Health and Care Excellence was searched for clinical guidelines and quality standards relevant to newborns. When gaps were identified, PubMed searches were conducted for up-to-date systematic reviews on relevant topics. The website of the European Standards of Care for Newborn Health project, an interdisciplinary European collaboration to develop standards of care for 11 areas in newborn health, was reviewed to determine its relevance to global standards of care for small and sick newborns.

6.1 Exclusion criteria

Ending preventable newborn deaths requires interventions delivered throughout the continuum of care, with high-quality care during labour, around birth and the first week of life and care for small and sick newborns. Care options given to the mother to improve newborn outcomes have been provided in WHO maternal health guidance documents addressing preterm birth outcomes and antenatal and intrapartum care for a positive childbirth experience.^{9,10,11,12} Interventions given to women in preterm labour that are published as standards include antenatal corticosteroids for preterm birth at 24–34 weeks' gestation, magnesium sulfate at birth before 32 weeks' gestation and antibiotics in preterm pre-labour rupture of membranes. Other relevant maternal interventions include maternal nutrition, maternal iron and folic acid supplementation, tetanus toxoid vaccination and delayed umbilical cord clamping. These interventions were not included in the standards for small and sick newborns.

6.2 Findings

Existing WHO guidance provides numerous standards and recommendations for the provision and experience of care. These include evidence-based care of small and sick newborns in domain 1 and other standards in domains 2–8 (see Fig. 1). The findings of the literature review were mapped to existing WHO guidance, and topics important for ensuring high-quality standards for small and sick newborns in health facilities under each of the eight domains were listed to identify gaps in WHO guidance.

⁹ WHO, UNFPA, UNICEF, The World Bank Group. Integrated management of pregnancy and childbirth. Pregnancy, childbirth, postpartum and newborn care: a guide for essential practice. Geneva: World Health Organization; 2015.

¹⁰ WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization; 2016.

¹¹ Managing complications in pregnancy and childbirth: a guide for midwives and doctors, 2nd edition. Geneva: World Health Organization; 2017.

¹² WHO recommendations: intrapartum care for a positive childbirth experience. Geneva: World Health Organization; 2018.

In summary, most evidence-based interventions were already included in WHO standards and recommendations for special care, but additional special care and neonatal intensive care interventions for small and sick newborns were required.^{13–18} There was limited advice on surveillance, prevention and management of important neonatal problems, including congenital abnormalities and retinopathy of prematurity, and on general and neurodevelopmental follow-up and screening. Gaps were found particularly in the newborn's experience of care, including newborn participation, newborn rights and respectful care.

Standards, quality statements and quality measures specific for small and sick newborns were drafted to augment existing WHO standards and to fill any gaps. Several drafts were prepared and shared with experts for external review, and a technical meeting was held on 10–12 April 2019 in Geneva. A final draft was prepared with input from that meeting and from WHO technical units.

6.3 Quality measures

When the quality measures in the *Standards for improving quality of maternal and newborn care in health facilities* (2016) and the *Standards for improving the quality of care for children and young adolescents in health facilities* (2018) were considered sufficient for small and sick newborns, they underwent minor modification to make them more applicable.

When new quality measures were required specifically for small and sick newborns, these were provided. All new quality statements were provided with new quality measures.

The standards, quality statements and quality measures for small and sick newborns include interventions to level 3 care for low- and middle-income countries. They do not include standards for high-technology interventions provided in high-income countries, which are listed in textbooks and clinical guidelines for neonatal intensive care.

¹³ Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.

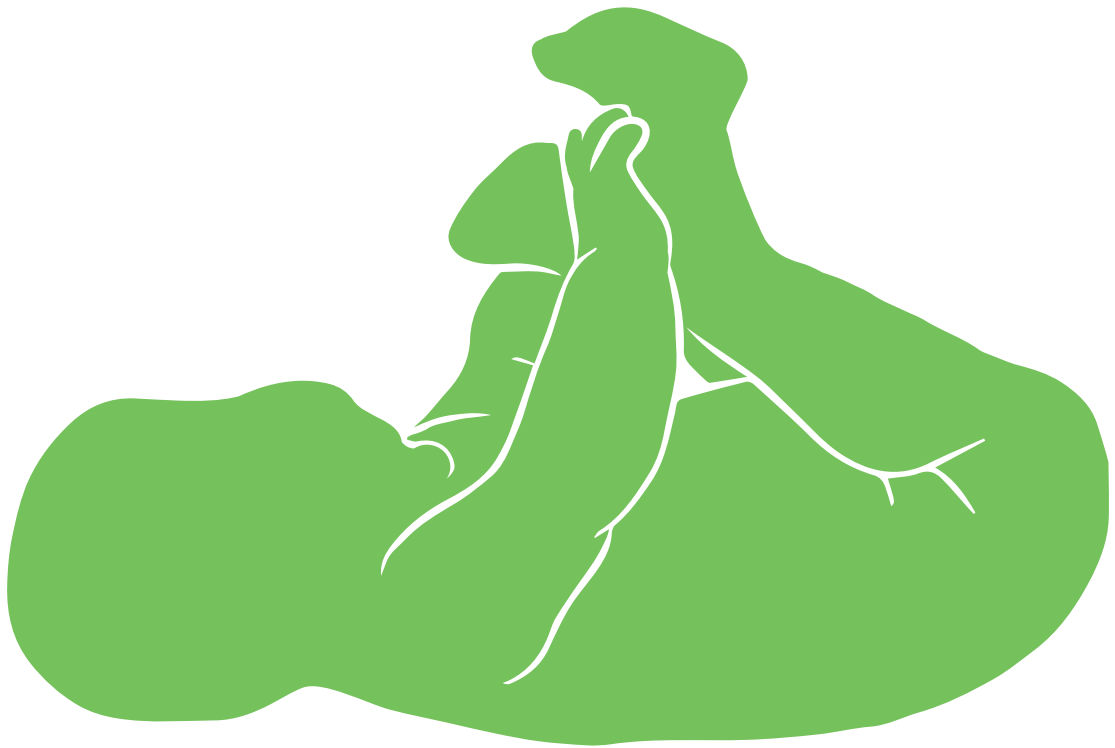
¹⁴ Standards for improving the quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.

¹⁵ Recommendations on newborn health. Geneva: World Health Organization; 2017.

¹⁶ Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.

¹⁷ Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. 2nd edition. Geneva: World Health Organization; 2013.

¹⁸ WHO recommendations on interventions to improve preterm birth outcomes. Geneva: World Health Organization; 2015.



Theme: Provision of care



Standard

- 1** Every small and sick newborn receives evidence-based care and management of illness according to WHO guidelines.



Standard

- 2** The health information system enables collection, analysis and use of data to ensure early appropriate action to improve the care of every small and sick newborn.



Standard

- 3** Every small and sick newborn with a condition or conditions that cannot be managed effectively with the available resources receives appropriate, timely referral through integrated newborn service pathways, with continuity of care, including during transport.

The standards place the newborn at the centre of care by improving both the provision and experience of health care for the newborns and their families. They are a critical component for strengthening health systems. They uphold newborn's right to health; the principle of the best interests of the child is the primary consideration throughout the health care services provided. Newborns and their families must receive the highest possible standard of care during health service delivery.

The standards are based on the eight domains of the framework for improving the quality of newborn care and address the most common conditions that affect the quality of care of small and sick newborns in health facilities.

STANDARD NEWBORN

Theme: Experience of care



Standard

- 4** Communication with small and sick newborns and their families is effective, with meaningful participation, and responds to their needs and preferences, and parental involvement is encouraged and supported throughout the care pathway.



Standard

- 5** Newborns' rights are respected, protected and fulfilled without discrimination, with preservation of dignity at all times and in all settings during care, transport and follow-up.



Standard

- 6** All small and sick newborns are given developmentally supportive care and follow-up, and their families receive emotional and psychosocial support that is sensitive to their needs and strengthens their capability.

DS FOR N CARE



Theme: Health system resources



Standard

7 For every small and sick newborn, competent, motivated, empathetic, multidisciplinary staff are consistently available to provide routine care, manage complications and provide developmental and psychological support throughout the care pathway.



Standard

8 The health facility has an appropriate physical environment, with adequate water, sanitation, waste management, energy supply, medicines, medical supplies and equipment for routine care and management of complications in small and sick newborns.



STANDARD 1

EVIDENCE-BASED PRACTICES FOR ROUTINE CARE AND MANAGEMENT OF COMPLICATIONS

Standard 1: Every small and sick newborn receives evidence-based routine care and management of complications according to WHO guidelines.

The aim of this standard is to ensure that all small and sick newborns receive evidence-based care and that the care is provided in their best interests. The standard guides health care professionals in providing high-quality care to small and sick newborns born at or presenting to health facilities. It includes care for all newborns and care that is specific for small and sick newborns. With some overlap with existing WHO standards, including *Standards for improving quality of maternal and newborn care in health facilities* and the *Standards for improving the quality of care for children and young adolescents in health facilities*, the quality statements have been revised and new statements added to reflect the needs of small and sick newborns.

The standards for evidence-based practices are:

- A. Care for all newborns
- B. Care for small and sick newborns
 - 1. Care for respiratory conditions
 - 2. Nutritional support for newborns
 - 3. Care for other conditions:
 - Seizures
 - Jaundice
 - Neonatal encephalopathy
 - Anaemia
 - Necrotizing enterocolitis
 - Retinopathy of prematurity

- Intraventricular haemorrhage
 - Surgical conditions
4. Clinical monitoring and supportive care
 5. Pain management and palliative care
 6. Care and advice at discharge

A. Care for all newborns

Quality statement 1.1: All newborns receive care with standard precautions to prevent health-care associated infections, including implementing additional measures required during outbreaks and pandemic situations.

Rationale: Small and sick newborns are at particular risk of health care-associated infections, and health care professionals should practice meticulous infection control. Attention to a clean physical environment, with strict cleaning protocols for cleaning incubators, phototherapy units and other equipment and surfaces, is necessary to reduce the risk of infection risk in vulnerable babies. During outbreaks such as the COVID-19 pandemic, health care professionals and visitors should follow updated WHO infection prevention and control guidelines and wear personal protective equipment as recommended. Surfaces must be cleaned and disinfected regularly.

Hand-washing before and after touching a newborn, early and exclusive breastfeeding and skin-to-skin contact are important in preventing infection.

The benefits of breastfeeding and nurturing mother–infant interaction to prevent infection and promote health and development are especially important when health and other community services are themselves disrupted or limited. Even if the mother is confirmed or suspected to have COVID-19, the numerous benefits of skin-to-skin contact and breastfeeding substantially outweigh the potential risks of transmission and illness associated with COVID-19; however, the mother should be supported in practising frequent handwashing with soap and water or using an alcohol-based hand rub, especially before touching the baby, and wearing a medical mask while feeding.

Newborn units in low- and middle-income countries are often overcrowded and newborn equipment is reused. Efforts should be made to reduce overcrowding, with a standard distance between cots or incubators, limiting one newborn per cot or incubator and ensuring sterilization of reusable equipment, including nasal prongs, self-inflating bags and masks.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines for standard infection prevention and control that include additional measures required during outbreaks and pandemic situations.
- The health facility has written, up-to-date guidelines, protocols, standard operating procedures and mechanisms for minimizing overcrowding, including one newborn per resuscitation unit, incubator or cot and appropriate space between beds in the neonatal unit and all areas where newborns are cared for in a facility.
- The health facility has standard operating procedures for disinfection of reusable neonatal equipment, including nasal prongs, self-inflating bags and face masks.
- The health facility has standard operating procedures for cleaning the neonatal clinic, incubators, phototherapy units and other neonatal equipment.

Process or output

- Proportion of staff in the labour room and neonatal unit trained in infection prevention practices including additional measures required during outbreaks and pandemic situations.
- Proportion of staff in the neonatal unit who practise hand hygiene according to WHO standards.
- Proportion of staff in the neonatal unit who wear personal protective equipment as recommended during outbreaks and pandemic situations.
- Proportion of reusable neonatal equipment disinfected by standard procedures.
- Number of times the neonatal clinical area and neonatal equipment are cleaned according to standard operating procedures.

Outcome

- Proportion of newborns admitted to the health facility with infections proven to be associated with health care.

References

- Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.
- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. Geneva: World Health Organization; 2016.
- WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009.

- Clinical management of COVID-19 Interim guidance 27 May 2020. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>).
- Q&A on COVID-19, pregnancy, childbirth and breastfeeding. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-on-covid-19-pregnancy-and-childbirth>, accessed 28 July 2020).
- Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Geneva: World Health Organization; 2020 ([https://www.who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125), accessed 28 July 2020).
- Coronavirus disease (COVID-19) outbreak: rights, roles and responsibilities of health workers, including key considerations for occupational safety and health. Geneva: World Health Organization; 2020 ([https://www.who.int/publications/i/item/coronavirus-disease-\(covid-19\)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health](https://www.who.int/publications/i/item/coronavirus-disease-(covid-19)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health), accessed 28 July 2020).
- Q&A: Masks and COVID-19. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-on-covid-19-and-masks>, accessed 28 July 2020).

Quality statement 1.2: All newborns are assessed immediately while receiving essential newborn care.

Rationale: Essential newborn care immediately after birth facilitates adaptation of the newborn to the new environment. After birth, newborns are dried thoroughly and placed in skin-to-skin contact with the mother, and clamping of the umbilical cord is delayed until 1–3 min after birth. The newborn should breastfeed within 1 h of birth and receive only breast milk and no other fluids. Essential newborn care avoids preventable complications and includes neonatal resuscitation, prevention of hypothermia and hypoglycaemia and weighing every baby.



QUALITY MEASURES

Input

- The health facility has written up-to-date guidelines, protocols and standard operating procedures for essential newborn care available in the childbirth areas of the maternity unit and all areas where newborns present for care, consistent with WHO guidelines.
- The health facility has all necessary supplies available in sufficient quantities for essential newborn care.

- Health care staff in the childbirth areas of the maternity unit and all areas where newborns present for care receive in-service training or regular refresher sessions in essential newborn care and breastfeeding support at least once every 12 months.
- The health facility has the appropriate suction device, correct sizes of mask (preterm and term) and self-inflating bags in good working order to perform newborn resuscitation.
- Health care staff in the childbirth areas of the maternity unit and all areas where newborns present for care receive at least monthly drills or simulation exercises and supportive supervision in essential newborn care and supporting breastfeeding.

Process or output

- Proportion of newborns born in the health facility whose birth weight is documented.
- Proportion of newborns born in the health facility breastfed within 1 h of birth.
- Proportion of newborns born in the health facility who received early essential newborn care (immediate and thorough drying, immediate skin-to-skin contact, delayed cord clamping and initiation of breastfeeding in the first hour).
- Proportion of liveborn newborns who were not breathing after additional stimulation who were resuscitated with a bag and mask.

Outcome

- Proportion of newborns who had a normal body temperature (36.5–37.5 °C) at the first complete examination (60–120 min after birth).

References

- Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.
- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.
- Vesel L, Bergh AM, Kerber KJ, Valsangkar B, Mazia G, Moxon SG, et al. Kangaroo mother care: a multi-country analysis of health system bottlenecks and potential solutions. *BMC Pregnancy Childbirth*. 2015;15(Suppl 2):S5.
- Conde-Agudelo A, Diaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. *Cochrane Database Syst Rev*. 2014;(4):CD002771.
- Essential newborn care course. Geneva: World Health Organization; 2010.

Quality statement 1.3 NEW: All newborns at risk are correctly identified as soon as possible after birth or on presentation to the health facility and receive additional care.

Rationale: All newborns born in the health facility or referred should be identified and assessed immediately, as small and sick newborns may require additional care. Liaison with maternal health providers prior to delivery, when possible, facilitates risk assessment for preterm and potentially sick newborns so that a team-based response to care may be initiated. Small and sick newborns should always be kept with their mothers, closely monitored for complications and their mothers given support in providing exclusive breastfeeding or alternative feeding. The risks for common complications (hypothermia, feeding problems, apnoea, respiratory distress syndrome and infections) are assessed, monitored, recognized early and appropriately managed. Antibiotics, safe oxygen therapy, continuous positive airway pressure and surfactant replacement are given as appropriate.

Clinically stable preterm newborns weighing < 2000 g should be provided with kangaroo mother care, an evidence-based intervention for newborns weighing < 2000 g, which prevents hypothermia and hypoglycaemia and promotes bonding. Meta-analyses show that kangaroo mother care reduces neonatal mortality, halving the number of deaths among infants weighing < 2000 g. kangaroo mother care also reduces infection and sepsis rates by nearly 60%. Newborns who are unstable are cared for in a clean incubator or under a radiant warmer and their temperature closely monitored.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for identification and immediate care or referral of newborns at risk in the childbirth areas of the maternity unit and all areas where newborns present for care that are consistent with WHO guidelines.
- The health facility has supplies and materials to provide optimal thermal care, including kangaroo mother care, for stable and unstable small and sick newborns.
- The health facility has a dedicated space, with infrastructure, supplies and materials, to provide optimal feeding to small and sick babies and support for breastfeeding or alternative feeding.
- Health care staff in the health facility who work with small and sick newborns receive in-service training and regular refresher sessions in management of high-risk newborns at least once every 12 months.

Process or output

- Proportion of all newborns born in or presenting to the health facility after birth who are weighed.
- Proportion of newborns weighing < 2000 g or preterm who attend the health facility who are initiated on kangaroo mother care (or admitted to the kangaroo mother care unit, if a separate unit exists).
- Proportion of eligible newborns (< 2000 g or preterm) who receive nearly continuous kangaroo mother care.

Outcome

- Proportion of all preterm babies (< 28 weeks, 28–32 weeks and 32–37 weeks of gestational age) born in the health facility who died within the first 7 days of life.
- Proportion of all small and sick newborns born in or admitted to the health facility who were fed exclusively on their mother's milk during their stay in the health facility.

References

- Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.
- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Vesel L, Bergh AM, Kerber KJ, Valsangkar B, Mazia G, Moxon SG, et al. Kangaroo mother care: a multi-country analysis of health system bottlenecks and potential solutions. BMC Pregnancy Childbirth. 2015;15(Suppl 2):S5.
- Conde-Agudelo A, Diaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev 2014;(4):CD002771.
- Essential newborn care course. Geneva: World Health Organization; 2010.

Quality statement 1.4: All referred newborns are triaged, promptly assessed for danger signs or injuries to determine whether they require resuscitation and receive appropriate care according to WHO guidelines.

Rationale: Small and sick newborns deteriorate rapidly; therefore, the health facility should have a triage system to identify, assess and provide appropriate care for those with life-threatening and serious medical and surgical problems. Standardized WHO triage guidelines are available and applicable to small and sick newborns. The health facility should have triage guidelines and emergency medicines, supplies and equipment specific for small and sick newborns, including equipment for airway management and administration of intravenous fluids, available in all areas of the health facility where newborns present. A newborn emergency box, fully equipped and ready to use at all times, will facilitate prompt access to the necessary commodities. Health facility staff must have the knowledge and skills to perform newborn resuscitation and initial care for common serious illness.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for emergency triage, assessment and management of common neonatal emergencies and injuries consistent with evidence-based and/or WHO guidelines.
- The health facility has the essential equipment and supplies for assessing and monitoring neonatal emergencies and injuries (e.g. weighing scales, thermometer, blood pressure measuring device, blood glucose and oxygen saturation tests).
- The health facility has a 24-h triage system for every small and sick newborn to ensure a rapid visual inspection within a few minutes of arrival that is not delayed by administrative or payment procedures.
- The health facility receiving a referred newborn with danger signs or injuries has a system for immediate emergency care, and a full initial assessment is made by suitably trained staff within 15 min of arrival.
- The health facility has a designated emergency care area, room or trolley in the outpatient area and wards equipped with appropriate neonatal equipment, supplies and essential medicines for emergency resuscitation and initial treatment.
- The designated emergency care area, room or trolley in the outpatient area and wards has visible emergency care aids (e.g. standardized algorithms or protocols, medicines, fluids and treatment dosage wall charts).
- The health facility professional staff organize emergency care drills at least once every 12 months for all staff working in emergency areas and on wards to which small and sick newborns are admitted.

Process or output

- Proportion of all newborns with danger signs or injuries who were assessed within 15 min of arrival at the facility.
- Proportion of all newborns with danger signs or injuries who required referral who received correct emergency and/or pre-referral treatment.
- Proportion of all professional health staff who care for children in the health facility who received training or refresher courses in neonatal emergency care during the previous 12 months.

Outcome

- Proportion of all newborns who died within 24 h of admission to the health facility whose cases were audited and reviewed as part of quality improvement.
- Proportion of newborns who attended the health facility who were triaged before seeing a doctor for treatment in the outpatient department, ward or emergency unit.
- Neonatal mortality rate in the health facility: number of neonatal deaths in the total number of neonates who presented to the health facility.

References

- Paediatric emergency triage, assessment and treatment: care of critically ill children. Geneva: World Health Organization; 2016.
- Emergency triage assessment and treatment (ETAT). Geneva: World Health Organization; 2005.

Quality statement 1.5: All newborns receive routine postnatal care, including weighing and temperature measurement.

Rationale: All newborns receive routine postnatal care, including a complete physical assessment. They are kept in skin-to-skin contact with the mother and given eye and umbilical cord care. Bathing is delayed for 24 h; vitamin K and vaccines are given as per the national guidelines; temperature is monitored; and complications are identified and managed. Low-birth-weight and small babies are given additional care as necessary. Knowing the weight of a newborn after delivery or when the newborn presents to the health facility improves decision-making for newborn care. The newborn's weight also facilitates calculation of doses of medications and intravenous fluids. Monitoring newborns during routine postnatal care allows identification of complications that require management.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for routine postnatal care available in the childbirth areas of the maternity unit and all areas where newborns present for care that are consistent with WHO guidelines.
- The health facility has supplies and materials to provide routine postnatal care, including functioning weighing scales and thermometers.
- The health facility practises and enables rooming-in to allow mothers and babies to remain together 24 h a day.
- Health care staff in the maternity unit and all areas where newborns present for care receive in-service training and regular refresher sessions in routine postnatal care and breastfeeding at least every 12 months.
- The health facility has local arrangements to ensure that every mother knows when and where postnatal care for herself and her newborn will be provided after discharge from the hospital.

Process or output

- Proportion of all newborns on postnatal care wards or areas in the health facility for whom there is documented information on the newborn body temperature, respiratory rate, feeding behaviour and the absence or presence of danger signs.
- Proportion of all stable newborns in the health facility who are fed exclusively on breast milk from birth to discharge.
- Proportion of all newborns in the health facility who received a full clinical examination before discharge.
- Proportion of all healthy mothers on postnatal wards or areas in the health facility who received breastfeeding counselling and support from a skilled health care provider.

References

- Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.
- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.
- Gleason CA, Devaskar SU, editors. Avery's diseases of the newborn. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.
- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth Edition. London: Churchill Livingstone Elsevier; 2012.
- Hegarty JE, Harding JE, Crowther CA, Brown J, Alsweiler J. Oral dextrose gel to prevent hypoglycaemia in at-risk neonates. Cochrane Database Syst Rev. 2017;(7): CD012152.
- Weston PJ, Harris DL, Battin M, Brown J, Hegarty JE, Harding JE. Oral dextrose gel for the treatment of hypoglycaemia in newborn infants. Cochrane Database Syst Rev. 2016;(5): CD011027.

Quality statement 1.6: All newborns are assessed for immunization status and receive recommended vaccinations according to the guidelines of the WHO Expanded Programme on Immunization.

Rationale: Small and sick newborns are at increased risk of mortality and morbidity from vaccine-preventable diseases and should be vaccinated before discharge if they have no specific contraindications. Correction for prematurity is not required if the newborn is well, and vaccines should be given according to chronological age, except for bacillus Calmette-Guérin (BCG), which should be given only once to newborns at 34 weeks of gestational age. Live vaccines should be given in a setting separate from the newborn unit to avoid infection of other newborns. Low-birth-weight preterm infants do not respond as well to hepatitis B-containing vaccines as full-term infants and require a booster.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for providing routine newborn immunization services, including for babies born preterm.

Process or output

- Proportion of all newborns who are discharged from the health facility who receive vaccines appropriate for their chronological age.
- Proportion of newborns who receive hepatitis B virus vaccine at the time of birth among all newborns.

References

- Routine EPI activities. Geneva: World Health Organization; 2020.
- Gagneur A, Pinquier D, Quach C. Immunization of preterm infants. Hum Vaccines Immunotherapeut. 2015;11(11):2556–63.
- Vaccination for preterm infants. Australian Immunisation Handbook. Canberra: Department of Health; 2019 (<https://immunisationhandbook.health.gov.au/vaccination-for-special-risk-groups/vaccination-for-preterm-infants>, accessed 28 July 2020).
- Immunisation of preterm infants. Melbourne: Safer Care Victoria; 2020 (<https://www2.health.vic.gov.au/hospitals-and-health-services/patient-care/perinatal-reproductive/neonatal-e handbook/infections/immunisation-preterm>, accessed 28 July 2020).

Quality statement 1.7 NEW: All newborns are given vitamin K according to WHO guidelines.

Rationale: Classical vitamin K deficiency is a serious but rare newborn condition, and vitamin K prophylaxis significantly reduces the risk of bleeding in neonates, with minimal evidence of harm. WHO recommends giving 1 mg of vitamin K intramuscularly to all newborns as soon as possible after birth. Newborns at high risk of bleeding, including those who require surgical procedures, those with birth trauma, preterm newborns and those exposed in utero to maternal medication known to interfere with vitamin K, are at particular risk, and particular attention should be paid to identifying and treating them.



QUALITY MEASURES

Input

- The health facility has vitamin K available at all times in the maternity unit and all areas where newborns present for care.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for postnatal care of newborns that include vitamin K administration in the maternity and/or postnatal care areas of the maternity unit and neonatal unit that are consistent with WHO guidelines.

Process or output

- Proportion of all newborns on postnatal care wards and neonatal unit of the health facility who received vitamin K.

References

- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.
- Ardell S, Offringa M, Ovelman C, Soll R. Prophylactic vitamin K for the prevention of vitamin K deficiency bleeding in preterm neonates. Cochrane Database Syst Rev. 2018;(2):CD008342.
- Puckett RM, Offringa M. Prophylactic vitamin K for vitamin K deficiency bleeding in neonates. Cochrane Database Syst Rev. 2000;(4):CD002776.

Quality statement 1.8: All newborns are protected from unnecessary or harmful practices, including separation from their mothers and families during their care.

Rationale: Newborns are at risk of unnecessary or harmful practices, including unnecessary procedures, treatment or admissions, prolonged hospital stays, being kept from their mothers and advertising and promotion of breast-milk substitutes and bottle-feeding. Newborns' experiences with caregivers can have a significant, lasting impact. Newborns feel pain and discomfort and can experience emotional distress, particularly when separated from their families in the first hours of life. Good early care, including attachment and breastfeeding, has a lasting positive impact on the health and well-being of newborns throughout their lives.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures on unnecessary procedures, harmful practices and unnecessary interventions for newborns.
- The health facility does not display infant formula or bottles and teats, including on posters or placards.
- Health care staff in the facility receive in-service training and regular refresher sessions on protecting newborns from harmful practices and unnecessary interventions at least once.

Process or output

- Proportion of newborns who had early bathing, routine suctioning, 100% oxygen, delayed or inadequate feeding and/or delayed initiation of kangaroo mother care.
- Proportion of newborns under a radiant warmer without a temperature probe for monitoring.
- Proportion of newborns on formula when this is not indicated for the health of the mother or the baby.
- Proportion of newborns admitted to wards with no indication for hospital admission.
- Proportion of newborns admitted to the health facility who receive intravenous fluids with no clear indication.
- Proportion of newborns admitted to the health facility for whom there were proven medication errors or hospital-acquired infections.
- Proportion of newborns seen at the health facility who received unnecessary oral or parenteral medicines.
- Proportion of newborns admitted to the health facility who received antibiotics when not indicated.

References

- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.
- Respectful maternity care charter. Universal rights of mothers and newborns. Washington DC: Global Respectful Maternity Care Council; 2019 (<https://www.whiteribbonalliance.org/respectful-maternity-care-charter/>, accessed 28 July 2020).

Quality statement 1.9: All newborns are screened for evidence of maltreatment, including neglect and violence, and receive appropriate care.

Rationale: Maltreatment of newborns comprises all types of physical and emotional ill treatment, abuse and neglect, including sexual abuse. Newborns who have experienced physical abuse may present with unintentional injuries or suspicious fractures, and those who have been sexually abused may present with injuries around the genitalia. Staff who care for infants should be able to recognize the warning signs of maltreatment, identify infants and families who may require assistance and take appropriate, timely action. Newborns who were possibly maltreated should be evaluated and managed and the cases reported or referred according to an established protocol. The facility should have a system for social and legal intervention when required. All health professionals and social workers should be trained in assessing, recognizing and caring for infant maltreatment.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for identifying, assessing and managing newborns who are suspected of having been maltreated.
- The health facility staff receive training and refresher sessions on screening, protecting and managing newborns with evidence of maltreatment, including neglect and violence.
- The health facility has the infrastructure, supplies and materials to provide optimal, coordinated care to newborns suspected of having been maltreated.

Process or output

- Proportion of all newborns suspected of having been maltreated who were managed according to established health facility procedures and protocols.
- Proportion of newborns who were maltreated for whom a legal opinion was requested.
- Proportion of maltreatment events in which coordination was sought with other agencies or organizations (e.g. social services, police, judiciary) according to national laws and policies.

Outcome

- Proportion of newborns who were maltreated.

References

- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.

Quality statement 1.10 NEW: All newborns are assessed for congenital abnormalities, managed appropriately and referred in a timely manner.

Rationale: Congenital abnormalities contribute to 6% of deaths of children under 5 years of age globally, of which 92% occur in low- and middle-income countries. The majority are detectable at birth, and two thirds of deaths due to these conditions are preventable with paediatric surgery and neonatal intensive care. The most common congenital abnormalities are cleft lip and palate, congenital heart anomalies and neural tube defects (spina bifida). Folic acid fortification can prevent more than half of neural tube defects. Talipes equinovarus (club foot) and developmental dysplasia of the hip are non-life-threatening conditions but require timely management to prevent morbidity. Congenital bowel abnormalities and abdominal wall defects require immediate surgical intervention.

The health outcomes of newborns with critical congenital heart defects are improved when they are identified before acute cardiovascular collapse and can be transported to a facility with specialist neonatal intensive care and cardiac surgery. Pulse oximetry is a highly specific, moderately sensitive test for detecting critical congenital heart defects, with very low false-positive rates. Current evidence supports the introduction of routine screening for such defects in asymptomatic newborns before discharge from the well-baby nursery.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for assessing and managing newborns with congenital abnormalities, including for specialist consultation and referral pathways.
- The health facility has adequate supplies for managing newborns with congenital abnormalities at a standardized level of care.
- The referral health facility has laboratory and diagnostic tests to manage newborns with congenital abnormalities.

Process or output

- Proportion of all newborns in the health facility with congenital abnormalities who are correctly referred to an appropriate referral centre according to standard operating procedures.
- Proportion of all newborns in the health facility with congenital abnormalities who were discharged without receiving care to address their congenital abnormality in the facility or through referral.

References

- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.

- Gleason CA, Devaskar SU, editors. Avery's diseases of the newborn. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.
- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth Edition. London: Churchill Livingstone Elsevier; 2012.
- WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization; 2016.
- Plana MN, Zamora J, Suresh G, Fernandez-Pineda L, Thangaratinam S, Ewer AK. Pulse oximetry screening for critical congenital heart defects. Cochrane Database Syst Rev. 2018;(3):CD011912.

Quality statement 1.11 NEW: All newborns whose gestational age is unknown are assessed with an appropriate tool for scoring gestational age.

Rationale: The gestational age of a newborn is best determined by the menstrual history (last menstrual period) of the mother and ultrasound dating in early pregnancy. If these methods are not available, physical examination and neuromuscular assessment of the newborn may be used to estimate gestational age and predict the infant's clinical course. Gestational age should be assessed soon after delivery. The principal method used is the new Ballard score, which combines physical and neurological criteria and is easier to administer than the longer Dubowitz method.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for assessing the gestational age of all newborns, including preterm newborns, according to guidelines.
- Health care staff who care for newborns in the health facility have access to a tool for scoring gestational age at all times.
- Health care staff who care for newborns in the health facility receive in-service training and regular refresher sessions in assessing the gestational age of newborns at least once.

Process or output

- Proportion of newborns in the health facility whose gestational age is unknown and age is assessed with an appropriate scoring tool before 24 h of age and recorded.

References

- Amiel-Tison C. Neurological evaluation of the maturity of newborn infants. Arch Dis Child. 1968;43:89.

- Dubowitz LM, Dubowitz V, Goldberg C. Clinical assessment of gestational age in the newborn infant. J Pediatr. 1970;77:1.
- Dubowitz L, Ricciw D, Mercuri E. The Dubowitz neurological examination of the full-term newborn. Ment Retard Dev Disabil Res Rev. 2005;11:52.
- Sanders M, Allen M, Alexander GR, Yankowitz J, Graeber J, Johnson TR, et al. Gestational age assessment in preterm neonates weighing less than 1500 grams. Pediatrics. 1991;88:542.
- Ballard JL, Novak KK, Driver M. A simplified score for assessment of fetal maturation of newly born infants. J Pediatr 1979;95:769.
- Alexander GR, de Caunes F, Hulsey TC, Tompkins ME, Allen M. Validity of postnatal assessments of gestational age: a comparison of the method of Ballard et al. and early ultrasonography. Am J Obstet Gynecol. 1992;166:891.
- Ballard JL, Khoury JC, Wedig K, Wang L, Eilers-Walsman BL, Lipp R. New Ballard score, expanded to include extremely premature infants. J Pediatr. 1991;119:417.
- Donovan EF, Tyson JE, Ehrenkranz RA, Verter J, Wright LL, Korones SB, et al. Inaccuracy of Ballard scores before 28 weeks' gestation. National Institute of Child Health and Human Development Neonatal Research Network. J Pediatr. 1999;135:147.

Quality statement 1.12: All newborns are assessed for suspected infection or risk factors for infection and, if required, investigated and given the correct antibiotic treatment according to WHO guidelines, avoiding overuse of antibiotics.

Rationale: Serious bacterial infection is a major cause of mortality and morbidity in newborns. All small and sick newborns are assessed for possible serious bacterial infections and receive prompt antibiotics and supportive care consistent with WHO guidance. Newborns may present with clinical signs associated with serious bacterial infection or be at risk of infection because of maternal signs and symptoms of infection (fever, prolonged rupture of membranes, foul-smelling or purulent amniotic fluid and abdominal pain and/or offensive vaginal discharge) or preterm pre-labour rupture of membranes. To avoid antimicrobial resistance, the health facility should promote antibiotic stewardship, avoiding overuse of antibiotics.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures consistent with WHO guidelines for prevention, early diagnosis and management of neonatal infection in the maternity unit and all areas where newborns are assessed and managed.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures on safe and rational use of antibiotics and other medications for small and sick newborns, based on their weight or age.

- The health facility has supplies of first-line injectable antibiotics in sufficient quantities at all times for the expected case-load.
- The referral health facility has supplies of injectable antibiotics (at least first- and second-line antibiotics for neonatal sepsis and meningitis) in sufficient quantities at all times for the expected case-load.
- Health care staff in the health facility know the signs of newborn sepsis and the correct diagnostic tests and treatment.
- Health care staff in the health facility who care for newborns receive in-service training and regular refresher sessions in the recognition and management of suspected newborn infections at least once every 12 months.

Process or output

- Proportion of newborns in the health facility for whom a blood culture was requested before antibiotic treatment was started.
- Proportion of all newborns in the health facility with signs of infection who received injectable antibiotics according to guidelines.
- Proportion of all newborns in the health facility whose mothers had signs of infection who received injectable antibiotics according to guidelines.

Outcome

- Proportion of newborns treated for sepsis in the health facility who died (case fatality rate).
- Proportion of all neonatal deaths in the health facility that were due to sepsis.

References

- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.
- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.

Quality statement 1.13 NEW: All newborns at risk of congenital syphilis are assessed, investigated and managed according to WHO guidelines.

Rationale: Mother-to-child transmission of syphilis (congenital syphilis) can be devastating to the fetus if maternal infection is not detected and treated sufficiently early in pregnancy. The burden of morbidity and mortality due to congenital syphilis is high. Adverse pregnancy outcomes attributed to syphilis include stillbirths, neonatal deaths, preterm and low-birth-weight babies and infected infants. Most untreated primary and secondary syphilis infections in pregnancy result in severe adverse pregnancy outcomes. Latent (asymptomatic) syphilis infections in pregnancy also cause serious adverse pregnancy outcomes in more than half of cases.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for the management of congenital syphilis according to WHO guidelines.
- The health facility has supplies of injectable antibiotics (benzyl penicillin or procaine penicillin and benzathine penicillin) available in sufficient quantities at all times for the expected case-load.
- The health facility has laboratory tests available for appropriate investigation of newborns at risk of congenital syphilis.

Process or output

- Proportion of all newborns in the health facility who are symptomatic or at high risk for congenital syphilis who received injectable antibiotics.

Outcome

- Proportion of newborns with congenital syphilis in the health facility.
- Proportion of all neonatal deaths in the health facility that were due to congenital syphilis.

References

- Guidelines for the treatment of *Treponema pallidum* (syphilis). Geneva: World Health Organization; 2016.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Methods for surveillance and monitoring of congenital syphilis elimination within existing systems. Geneva: World Health Organization; 2011.
- WHO guideline on syphilis screening and treatment for pregnant women. Geneva: World Health Organization; 2017.
- Global guidance on criteria and processes for validation: elimination of mother-to-child transmission (EMTCT) of HIV and syphilis. Geneva: World Health Organization; 2014.

Quality statement 1.14 NEW: All newborns receive eye prophylaxis, are assessed for ophthalmia neonatorum and, if required, managed according to WHO guidelines.

Rationale: Infants of mothers with gonococcal infection may be infected at delivery, resulting in neonatal conjunctivitis manifesting as purulent ocular discharge and swollen eyelids. Untreated conjunctivitis may lead to scarring and blindness. Maternal infection with chlamydia is associated with serious adverse outcomes in neonates, such as preterm birth, low birth weight, conjunctivitis, nasopharyngeal infection and pneumonia.

For all neonates, the WHO guidelines on sexually transmitted infections recommend topical ocular prophylaxis for the prevention of gonococcal and chlamydial ophthalmia neonatorum. Research has shown large benefits of prophylaxis over no prophylaxis, in particular in babies born to women with known infection, with an approximately 70% reduction in conjunctivitis with prophylaxis with various medications. The benefits of treatment with different medications are similar.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for the prevention and management of ophthalmia neonatorum in newborns according to WHO guidelines.
- The health facility has supplies of injectable and oral antibiotics (ceftriaxone or kanamycin or spectinomycin and azithromycin or erythromycin, tetracycline) and topical antibiotics (tetracycline hydrochloride 1% ointment, erythromycin 0.5% ointment, povidone iodine 2.5% solution, silver nitrate 1% solution or chloramphenicol 15 ointment) for prevention and treatment available in sufficient quantities at all times for the expected case-load.
- Health care staff in the health facility know how to prevent, identify and treat ophthalmia neonatorum according to WHO guidelines.

Process or output

- Proportion of all newborns in the health facility with ophthalmia neonatorum who received injectable antibiotics for gonococcal conjunctivitis.
- Proportion of all newborns in the health facility with ophthalmia neonatorum who received oral antibiotics for chlamydial conjunctivitis.

References

- Guidelines for the treatment of chlamydia trachomatis. Geneva: World Health Organization; 2016.
- Guidelines for the treatment of *Neisseria gonorrhoeae*. Geneva: World Health Organization; 2016.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.

Quality statement 1.15: All newborns at risk for tuberculosis and/or HIV infection are correctly assessed, investigated and receive appropriate management according to WHO guidelines.

Rationale: Newborns are at risk of HIV infection from an HIV-positive mother during pregnancy, labour, delivery or breastfeeding through mother-to-child transmission. In the absence of any intervention, transmission rates range from 15% to 45%. This rate can be reduced to below 5% with effective interventions during pregnancy, labour, delivery and breastfeeding. All mothers should be tested for HIV and tuberculosis (if indicated) to determine the risk of the newborn for exposure, especially in settings with a high HIV prevalence. WHO has provided guidance on HIV infection in children and newborns, including prevention of mother-to-child transmission and provision of antiretroviral prophylaxis and/or treatment if they are infected with HIV. WHO guidance is also available on tuberculosis infection in children.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures on assessing and managing newborns at risk of or with suspected tuberculosis infection.
- The health facility offers routine screening for tuberculosis among newborns at risk (e.g. history of contact with a case of active tuberculosis, malnourished or with HIV/AIDS).
- Health facilities in areas with a high prevalence of HIV infection routinely offer HIV counselling and testing to mothers of small and sick newborns.
- The health facility has adequate supplies of isoniazid for prevention of tuberculosis in newborns and access to medicines for treatment of tuberculosis, in coordination with the national tuberculosis programme.
- The health facility has adequate supplies of antiretroviral therapy and preventive therapy (co-trimoxazole) available at all times for newborns exposed to and/or infected with HIV.

Process or output

- Proportion of all newborns with a household contact with active tuberculosis who received tuberculosis preventive treatment.
- Proportion of all HIV-positive women who delivered in the health facility who receive appropriate prophylaxis to prevent mother-to-child transmission and antiretroviral therapy according to WHO guidelines.
- Proportion of all babies born to HIV-infected mothers who were tested for HIV infection within eight weeks of birth and received appropriate antiretroviral therapy according to WHO guidelines.

Outcome

- Case fatality rate among newborns with HIV infection in the facility.
- Case fatality rate among newborns with tuberculosis infection in the facility.

References

- Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.
- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.
- Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach. Second edition. Geneva: World Health Organization; 2016.

Quality statement 1.16 NEW: All newborns at risk of impaired metabolic adaptation associated with asphyxia, small-for-gestational age and maternal diabetes, are assessed to identify and manage hypoglycaemia.

Rationale: Small and sick newborns are at risk of low blood glucose, defined as a blood glucose level < 2.5 mmol/L (45 mg/dL). These babies often have limited glycogen stores or immature liver function. Newborns born preterm, with low birth weight, sepsis, hypothermia, hypoxic ischaemic encephalopathy, polycythaemia or inadequate feeding are at particular risk. Newborns of diabetic mothers and those who are large for gestational age (> 90 th percentile and/or > 4.5 kg), with birth defects or with congenital metabolic diseases are also at risk. All newborns who have seizures should have their blood glucose checked and should be managed appropriately. Symptoms of hypoglycaemia, such as jitteriness, cyanosis, apnoea, hypothermia, poor body tone, poor feeding, lethargy and seizures, may be absent; therefore, blood glucose should be assessed routinely in these at-risk newborns. Appropriate feeding of small and sick newborns can prevent hypoglycaemia. Guidance and recommendations are available in WHO guidelines. A Cochrane review showed that treatment of infants with neonatal hypoglycaemia with 40% dextrose gel reduces the incidence of mother–infant separation for treatment and increases the likelihood of full breastfeeding after discharge.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for the care of small and sick newborns that include prevention and management of hypoglycaemia in those at risk of impaired metabolic adaptation, consistent with WHO guidelines.

- The health facility has laboratory and diagnostic tests available for monitoring blood glucose in newborns at risk of impaired metabolic adaptation.
- The health facility has supplies for managing newborns with hypoglycaemia.

Process or output

- Proportion of small and sick newborns in the health facility at risk of impaired metabolic adaptation whose blood glucose is checked on admission.
- Proportion of small and sick newborns in the health facility with impaired metabolic adaptation who are treated according to standard treatment guidelines.

Outcome

- Proportion of newborns at risk of impaired metabolic adaptation with documented hypoglycaemia whose blood glucose was normalized within 30 min.

References

- Managing newborn problems. Geneva: World Health Organization; 2003.
- Gleason CA, Juul SE, editors. Avery's diseases of the newborn. 10th edition. New York City (NY): Elsevier Saunders; 2018.
- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth edition. London: Churchill Livingstone Elsevier; 2012.
- Hegarty JE, Harding JE, Crowther CA, Brown J, Alsweiler J. Oral dextrose gel to prevent hypoglycaemia in at-risk neonates. Cochrane Database Syst Rev. 2017;(7):CD012152.
- Weston PJ, Harris DL, Battin M, Brown J, Hegarty JE, Harding JE. Oral dextrose gel for the treatment of hypoglycaemia in newborn infants. Cochrane Database Syst Rev. 2016;(5):CD011027.

B. Care for small and sick newborns

B1. Care for respiratory conditions

Quality statement 1.17 NEW: Small and sick newborns are assessed for signs of respiratory compromise, and a neonatal pulse oximeter is used to detect hypoxia or hyperoxia and to guide administration of supplemental oxygen according to WHO guidelines

Quality statement 1.18 NEW: Preterm newborns born at or before 32 weeks of gestation who require respiratory support are given between 21% (air) and 30% oxygen, and the need for increasing oxygen concentrations is reviewed to ensure oxygen saturation between 90% and 95%.

Quality statement 1.19 NEW: Small and sick newborns requiring supplemental oxygen therapy receive it safely through appropriate neonatal equipment, including neonatal nasal prongs, low-flow meters, air-oxygen blenders, humidifiers and pulse oximeters.

Quality statement 1.20 NEW: Small and sick newborns are assessed and managed for apnoea, and preterm newborns are managed to prevent apnoea according to WHO guidelines.

Quality statement 1.21 NEW: Newborns with respiratory distress are treated with continuous positive airway pressure as soon as the diagnosis is made, according to WHO guidelines.

Quality statement 1.22 NEW: Small and sick newborns are assessed for surfactant deficiency, and surfactant replacement therapy is administered to preterm newborns within the first 2 h of birth according to WHO guidelines.

Quality statement 1.23 NEW: Small and sick newborns at risk of bronchopulmonary dysplasia are assessed, investigated and managed as per standard guidelines.

Rationale: Pulse oximetry determines the presence of hypoxia and hyperoxia, and guides administration of oxygen therapy in newborns. Pulse oximetry is more accurate than clinical signs for detecting hypoxaemia and requires less training. In comparison with blood gas analysis, pulse oximetry is non-invasive, faster, less expensive, requires minimal infrastructure and no laboratory facilities, is less prone to erroneous measurements and allows continuous monitoring.

Small and sick newborns with hypoxia should receive appropriate oxygen therapy, and effective oxygen delivery systems should be a universal standard of care. Research on the use of lower and higher oxygen concentrations in newborns, including those < 32 weeks' gestational age, has shown a significant benefit of low oxygen concentrations for resuscitation in terms of overall and in-hospital neonatal mortality. No association was found between ventilation with low oxygen concentrations for neonatal resuscitation and severe morbidity. Lower oxygen concentrations also reduce the risk of retinopathy of prematurity.

Recurrent apnoea is common in preterm infants, particularly those at very early gestational ages. Such episodes of ineffective breathing can lead to hypoxia and bradycardia that may be severe enough to require positive pressure ventilation. Methylxanthines (such as caffeine, theophylline and aminophylline) have been used to stimulate breathing and reduce apnoea and its consequences. Methylxanthine is effective in reducing the number of apnoeic attacks and use of mechanical ventilation in the 2–7 days after starting treatment. Caffeine is also associated with better longer-term outcomes. In view of its lower toxicity, caffeine is the preferred drug for treatment of apnoea.

Continuous positive airways pressure in preterm newborns with respiratory distress syndrome resulted in a 48% reduction in overall in-hospital neonatal mortality and significantly lower risk of respiratory failure requiring assisted breathing as compared with oxygen therapy alone. Continuous positive airways pressure should be introduced in health facilities with overall good quality of care, including the ability to monitor oxygen saturation and cardiorespiratory status. It should be commenced as soon as respiratory distress is recognized.

Surfactant replacement therapy given early within the first 2 h of birth to intubated and mechanically ventilated preterm newborns with respiratory distress syndrome has also been shown to reduce neonatal deaths and short- and long-term complications of air leaks and bronchopulmonary dysplasia. Surfactant may be administered to non-intubated newborns by passing a feeding tube through the vocal cords, giving the surfactant and then removing the tube. Surfactant replacement therapy should be provided only in health facilities with a functioning newborn unit and good quality care, including the availability of health professionals skilled in intubation, ventilator care, blood gas analysis, newborn nursing care and monitoring.



QUALITY MEASURES FOR RESPIRATORY CONDITIONS

Input

- The health facility has written, up-to-date oxygen therapy guidelines, protocols and standard operating procedures for assessment of hypoxia and hyperoxia with a neonatal pulse oximeter, determining the need for oxygen therapy and safe use of supplemental oxygen in small, sick and preterm newborns according to WHO guidelines.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for the use of continuous positive airways pressure in preterm newborns with respiratory distress according to WHO guidelines.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for use of surfactants in newborns with respiratory distress according to WHO guidelines.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for intubation, ventilation and other methods of ventilation, including non-invasive ventilation, in newborns.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for assessing, managing and preventing apnoea in newborns.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for assessing, investigating and managing newborns at risk of bronchopulmonary dysplasia.
- The health facility has adequate supplies of medications for management of newborn respiratory conditions for the expected case-load, with no stock-outs.
- The health facility has adequate safe, appropriate medical gas supplies and equipment for management of newborns with respiratory conditions.
- The health facility has appropriate laboratory and diagnostic tests available for investigating newborns with respiratory conditions.

- The health facility clinical staff who care for newborns receive training and regular refresher sessions in assessing and managing newborns with respiratory conditions at least once every 12 months.

Process or output

- Proportion of all newborns with signs of hypoxia or oxygen saturation < 90% in whom blended oxygen was appropriately administered for the clinical indication.
- Proportion of all preterm newborns born at or before 32 weeks' gestation who require resuscitation who are commenced on between 21% (air) and 30% oxygen, and the need for increasing oxygen concentrations is reviewed to ensure oxygen saturation between 90% and 95%.
- Proportion of all newborns with respiratory conditions who received correct antibiotic treatment (formulation, dose, frequency and duration) to prevent or treat infection according to WHO guidelines.
- Proportion of preterm newborns (< 32 weeks' gestation) given caffeine or another methylxanthine to prevent apnoea.
- Proportion of all newborns admitted with respiratory conditions whose respiratory rate and oxygen saturation were appropriately monitored.

Outcome

- Proportion of all newborns with respiratory conditions in the health facility who died (case fatality rate).
- Proportion of all newborns treated for respiratory conditions in the health facility who are oxygen-dependent at 28 days of age (as a proxy of bronchopulmonary dysplasia).

References

- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.
- Askie LM, Darlow BA, Davis PG, Finer N, Stenson B, Vento M, et al. Effects of targeting lower versus higher arterial oxygen saturations on death or disability in preterm infants. *Cochrane Database Syst Rev.* 2017;(4):CD011190.
- Lui K, Jones LJ, Foster JP, Davis PG, Ching SK, Oei JL, et al. Lower versus higher oxygen concentrations titrated to target oxygen saturations during resuscitation of preterm infants at birth. *Cochrane Database Syst Rev.* 2018;(5):CD010239.
- Technical specifications for oxygen concentrators (WHO Medical Device Technical Series). Geneva: World Health Organization; 2015.
- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.
- Henderson-Smart DJ, De Paoli AG. Methylxanthine treatment for apnoea in preterm infants. *Cochrane Database Syst Rev.* 2010;(12):CD000140.
- Ballout RA, Foster JP, Kahale LA, Badr L. Body positioning for spontaneously breathing preterm infants with apnoea. *Cochrane Database Syst Rev.* 2017;(1):CD004951.

B2. Nutritional support for newborns

Quality statement 1.24 NEW: Small and sick newborns are fed appropriately, including assisted feeding with the mother's milk when possible, according to WHO guidelines.

Quality statement 1.25 NEW: Small and sick newborns who cannot tolerate enteral feeding or for whom enteral feeding is contraindicated are provided with parenteral nutrition in correct amounts and composition according to standard guidelines.

Quality statement 1.26 NEW: All newborns of HIV-infected mothers are fed appropriately according to WHO guidelines.

Quality statement 1.27 NEW: All very-low-birth-weight newborns are given vitamin D, calcium, phosphorus and iron supplements according to WHO guidelines.

Rationale: Breast milk is the best nutrition for all newborns, including those who are small and sick. Breast milk boosts immunity, promotes weight gain, prevents low blood sugar and supports brain development. Mothers of small and sick newborns may need special support to initiate and maintain lactation when the newborn is unable to feed at the breast. If maternal breast milk is not available or is contraindicated, safe donated human milk is an acceptable alternative.

WHO has made recommendations on the duration of breastfeeding by mothers living with HIV and recommends lifelong antiretroviral therapy for everyone, from the time of first diagnosis of HIV infection. Mothers living with HIV should breastfeed for at least 12 months and may continue breastfeeding for up to 24 months or longer (similar to the general population) with full support for adherence to antiretroviral therapy.

Many preterm newborns have delayed or impaired sucking and require help, which may include expressing human milk, cup or nasogastric tube feeding and occasionally intravenous fluids. If expressed breast milk or other feeds are required for preterm infants, feeding methods such as cups or spoons are preferable to feeding bottles and teats. For preterm infants who are unable to breastfeed directly, non-nutritive sucking and oral stimulation may be beneficial until breastfeeding is established. Babies with severe illness may require intravenous fluids in addition to nasogastric tube feeding. Babies with necrotizing enterocolitis who need bowel rest and those with the most serious conditions will require special nutritional formula intravenously (total parenteral nutrition). Very-low-birth-weight newborns are given vitamin D, calcium and phosphorus to prevent bone disease of prematurity and iron supplementation to reduce the risk of anaemia.



QUALITY MEASURES FOR RESPIRATORY CONDITIONS

Input

- The health facility has a written infant feeding policy that reflects the clinical practices of the “ten steps to successful breastfeeding”, that protects breastfeeding for all newborns by implementing the International Code of Marketing of Breast-milk Substitutes and is routinely communicated to all health care and support staff.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for exclusive breastfeeding and optimal feeding of small and sick newborns, including newborns of HIV-infected mothers, that include target volumes, feeding advancement and criteria for initiating exclusive enteral nutrition, consistent with WHO guidelines.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for total parenteral nutrition in the neonatal intensive care unit and pharmacy that include indications for appropriate use, preparation, administration and monitoring.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for providing vitamin D, calcium, phosphorus and iron supplements for very-low-birth-weight newborns according to WHO guidelines.
- The health facility has the supplies and materials to provide optimal feeding of small and sick newborns and support for breastfeeding or alternative feeding, including feeding cups and spoons, nasogastric tubes, breast pumps, safe milk-storage facilities, donor human milk, breast milk fortifiers and infant formula.
- The health facility has parenteral nutrition equipment and supplies for safe administration.
- The health facility has supplies of vitamin D, calcium, phosphorus and iron supplements in appropriate formulations for very-low-birth-weight newborns.
- The health facility has a dedicated space that provides privacy for the mother to express breast milk.
- The health facility has a mechanism for establishing newborn feeding, preferably with breast milk, supporting mothers in expressing breast milk and maintaining lactation and monitoring feeding difficulties, growth and breastfeeding.
- Health care staff in the health facility who care for newborns receive in-service training and regular refresher sessions in counselling on breastfeeding and optimal feeding of small and sick newborns, including newborns of HIV-infected mothers, at least once every 12 months.

Process or output

- Proportion of small and sick newborns in the health facility who receive assisted feeding with a documented, correctly prescribed feed volume appropriate for their weight, gestational or postnatal age.
- Proportion of carers of small and sick newborns in the health facility who have received counselling on breastfeeding or optimal feeding of newborns, including provision of breast milk or breast milk substitutes.

- Proportion of breastfeeding mothers who report that they were shown how to express breast milk and who were given written information about expressing breast milk.
- Proportion of the health facility staff who received training or orientation in counselling on breastfeeding, at least once in the previous 12 months.
- Proportion of health facilities in which high-quality, nutritious meals and drinking-water are provided for breastfeeding women.
- Proportion of very-low-birth-weight newborns in the health facility who are given the recommended doses of vitamin D, calcium, phosphorus and iron supplements.

Outcome

- Proportion of all newborn infants in the health facility who receive breast milk or fully established breastfeeding at the time of discharge.
- Proportion of mothers of breastfed preterm and term newborns who can correctly demonstrate or describe how to express breast milk and the safe handling of expressed breast milk.

References

- Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services. Geneva: World Health Organization; 2017.
- Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services; the revised baby-friendly hospital initiative: implementation guidelines. Geneva: World Health Organization; 2018.
- Guidelines on optimal feeding of low birth-weight infants in low-and middle-income countries. Geneva: World Health Organization; 2011.
- Implementation guidance: Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services; the revised baby-friendly hospital initiative. Geneva: World Health Organization; 2018.
- Foster JP, Psaila K, Patterson T. Non-nutritive sucking for increasing physiologic stability and nutrition in preterm infants. *Cochrane Database Syst Rev.* 2016;(10):CD001071.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.
- Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach. Second edition. Geneva: World Health Organization; 2016.
- Guideline: updates on HIV and infant feeding: the duration of breastfeeding, and support from health services to improve feeding practices among mothers living with HIV. Geneva: World Health Organization; 2016.
- Flint A, New K, Davies MW. Cup feeding versus other forms of supplemental enteral feeding for newborn infants unable to fully breastfeed. *Cochrane Database Syst Rev.* 2016;(8):CD005092.
- Nyqvist KH, Sjoden PO, Ewald U. The development of preterm infants' breastfeeding behavior. *Early Hum Dev.* 1999;55(3):247–64.

- Neo-BFHI: the Baby-friendly Hospital Initiative for neonatal wards. Three guiding principles and ten steps to protect, promote and support breastfeeding. Core document with recommended standards and criteria. Morrisville (NC): International Lactation Consultant Association; 2015 (<http://www.ilca.org/main/learning/resources/neo-bfhi>, accessed 28 July 2020).
- Neo-BFHI: The Baby-friendly Hospital Initiative for neonatal wards. Self-appraisal tool to assess standards and criteria. Morrisville (NC): International Lactation Consultant Association; 2015 (<http://www.ilca.org/main/learning/resources/neo-bfhi>, accessed 28 July 2020).
- Wight N, Kim J, Rhine W, Mayer O, Morris M, Sey R, et al. Nutritional support of the very low birth weight (VLBW) infant: a quality improvement toolkit. Stanford (CA): California Perinatal Quality Care Collaborative; 2018.

B3. Care for other conditions

Quality statement 1.28 NEW: All newborns are routinely monitored for the development of jaundice; bilirubin is measured in those at risk and treatment initiated in those with hyperbilirubinaemia according to WHO guidelines.

Rationale: Jaundice is common in all newborns. Without treatment, it can lead to acute bilirubin encephalopathy (kernicterus), resulting in long-term motor, language and hearing problems. Preterm and low-birth-weight newborns are at particular risk because of increased production of bilirubin and an immature liver. Most cases are treated with effective, safe phototherapy, preferably with high-intensity light emitting diodes (LED), and regular monitoring of blood bilirubin levels. Continuing to feed newborns, particularly with breast milk, is important when they are receiving phototherapy. Intravenous fluids are required if the bilirubin levels are very high. Severe neonatal jaundice may require exchange transfusion. Newborns with jaundice are assessed for underlying causes, including Rhesus disease, and are screened for glucose-6 phosphate dehydrogenase deficiency.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for assessing and managing jaundice in newborns.
- The health facility has standard operating procedures for setting up, maintaining and cleaning phototherapy units for managing jaundice in newborns.
- The health facility has protocols and standard operating procedures for performing or referring for exchange transfusion of small and sick newborns with severe jaundice.
- The health facility has appropriate laboratory and diagnostic tests available for investigating newborns with jaundice.

- The health facility has an adequate supply of functioning, maintained phototherapy units (LED phototherapy) and other supplies for the management of jaundice, with no stock-outs.
- The health facility clinical staff who care for newborns receive training and regular refresher sessions in assessing and managing newborns with jaundice at least once.

Process or output

- Proportion of all newborns admitted to the health facility who are visually screened for jaundice by an established mechanism.
- Proportion of all newborns admitted to the health facility who are assessed for jaundice from serum bilirubin or with a transcutaneous bilirubinometer.
- Proportion of all newborns who require phototherapy who actually receive it according to guidelines.

Outcome

- Proportion of all small and sick newborns with jaundice who require exchange transfusion.
- Proportion of all newborns with jaundice in the health facility who develop kernicterus.

References

- Gleason CA, Devaskar SU, editors. Avery's diseases of the newborn. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.
- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth Edition. London: Churchill Livingstone Elsevier; 2012.
- Kumar P, Chawla D, Deorari A. Light-emitting diode phototherapy for unconjugated hyperbilirubinaemia in neonates. Cochrane Database Syst Rev. 2011;(12):CD007969.
- Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.
- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.
- Lai NM, Ahmad Kamar A, Choo YM, Kong JY, Ngim CF. Fluid supplementation for neonatal unconjugated hyperbilirubinaemia. Cochrane Database Syst Rev. 2017;(8):CD011891.
- Jaundice in newborn babies under 28 days. Clinical guideline. London: National Institute for Health Care and Excellence; 2010.
- Jaundice in newborn babies under 28 days. Quality standard. London: National Institute for Health Care and Excellence; 2014.

Quality statement 1.29 NEW: Small and sick newborns are assessed and managed for seizures according to WHO guidelines.

Rationale: Neonatal seizures are some of the most frequent neurological events in newborns, reflecting a variety of pre-, peri- or postnatal disorders of the central nervous system. They are also a common manifestation of metabolic abnormality in the newborn period and are often the first sign of neurological dysfunction. The commonest causes of neonatal convulsions include neonatal encephalopathy, central nervous system infections, hypoglycaemia and hypocalcaemia. Small and sick newborns are at increased risk of neonatal seizures because of associated intracranial haemorrhage. Neonatal seizures must be assessed promptly, with airway and breathing support, ensuring intravenous access, checking blood glucose and treatment with 10% dextrose if hypoglycaemia is detected. Seizures in newborns are managed with phenobarbitone as the first-line medication. All newborns with seizures should be further investigated for the underlying causes.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for assessing and managing seizures in newborns.
- The health facility has appropriate laboratory and diagnostic tests available for investigation of newborns with seizures.
- The health facility has adequate supplies and medicines for the management of seizures in newborns, with no stock-outs.
- The health facility clinical staff who care for small and sick newborns receive training and regular refresher sessions in assessing and managing seizures in newborns at least once.

Process or output

- Proportion of small and sick newborns in the health facility with seizures who were assessed according to WHO guidelines.
- Proportion of small and sick newborns in the health facility with seizures whose serum glucose was checked.
- Proportion of small and sick newborns in the health facility with seizures who require anticonvulsants but do not receive medication.
- Proportion of all small and sick newborns in the health facility with seizures whose serum calcium is checked.

Outcome

- Proportion of small and sick newborns in the health facility with seizures who died (case fatality rate).

References

- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.
- Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.
- Guidelines on neonatal seizures. Geneva: World Health Organization; 2011.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Gleason CA, Devaskar SU, editors. Avery's diseases of the newborn. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.
- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth Edition. London: Churchill Livingstone Elsevier; 2012.

Quality statement 1.30 NEW: Small and sick newborns at risk for neonatal encephalopathy receive early evaluation, close monitoring and appropriate management according to WHO guidelines.

Rationale: Neonatal encephalopathy is a disorder of neonatal brain function. Periods of insufficient oxygen at and around the time of birth are the main reason for neonatal encephalopathy, which also affects other organs, including the kidneys and liver. High-quality obstetric care and effective neonatal resuscitation at birth prevent neonatal encephalopathy. The signs and symptoms of neonatal encephalopathy evolve over time and can be classified as mild, moderate or severe. Mildly affected newborns present as hyper-alert or irritable, with poor sucking and feeding. Moderate and severely affected newborns present with lethargy, reduced level of consciousness, poor or absent sucking and abnormal movements. The more severe cases include clinical seizures that can progress to loss of consciousness and apnoea. Any newborn in poor condition or who requires resuscitation should be monitored to detect the clinical signs of neonatal encephalopathy. Inpatient care for those affected by neonatal encephalopathy includes cardiorespiratory support, treatment of apnoea, prevention of dehydration and hypoglycaemia (fluids and feeding) and seizure management with anticonvulsant therapy (e.g. phenobarbitone).

There is strong evidence that therapeutic hypothermia is beneficial in both term and late-preterm newborns with hypoxic ischaemic encephalopathy. Cooling reduces mortality without increasing major disability in survivors. The benefits of cooling on survival and neurodevelopment outweigh the short-term adverse effects, but newborns with hypoxic ischaemic encephalopathy should receive head or whole-body cooling only in well-resourced tertiary neonatal intensive care units. Hypothermia should be instituted in term and late-preterm infants with moderate-to-severe hypoxic ischaemic encephalopathy if the condition is identified before 6 h of age. Studies have shown that therapeutic hypothermia reduces the incidence of cerebral palsy to a greater extent than standard care.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for assessing and managing neonatal encephalopathy in newborns.
- The health facility has appropriate laboratory and diagnostic tests available for investigation of newborns with neonatal encephalopathy.
- The health facility has adequate supplies and medicines for management of small and sick newborns with neonatal encephalopathy, with no stock-outs.
- The health facility providing neonatal intensive care has functioning, well-maintained cooling systems for cooling the head and whole body of newborns with severe hypoxic ischaemic encephalopathy that are controlled and monitored.
- The health facility clinical staff who care for newborns receive training and regular refresher sessions in assessing and managing neonatal encephalopathy at least once.

Process or output

- Proportion of all newborns with neonatal encephalopathy who were managed according to evidence-based guidelines.

Outcome

- Proportion of all newborns admitted to the health facility with neonatal encephalopathy.
- Proportion of all newborns with neonatal encephalopathy who died (case fatality rate).

References

- Ellis M, Manandhar N, Manandhar DS, Costello AM. Risk factors for neonatal encephalopathy in Kathmandu, Nepal, a developing country: unmatched case-control study. *BMJ*. 2000;320(7244):1229–36.
- Tann CJ, Nakakeeto M, Willey BA, Sewegaba M, Webb EL, Oke I, et al. Perinatal risk factors for neonatal encephalopathy: an unmatched case-control study. *Arch Dis Child Fetal Neonatal Ed*. 2018;103(3):F250–6.
- Jacobs SE, Berg M, Hunt R, Tarnow-Mordi WO, Inder TE, Davis PG. Cooling for newborns with hypoxic ischaemic encephalopathy. *Cochrane Database Syst Rev*. 2013;(1):CD003311.
- Shepherd E, Salam RA, Middleton P, Han S, Makrides M, McIntyre S, et al. Neonatal interventions for preventing cerebral palsy: an overview of Cochrane Systematic Reviews. *Cochrane Database Syst Rev*. 2018;(6) CD012409.
- Kecskes Z, Healy G, Jensen A. Fluid restriction for term infants with hypoxic-ischaemic encephalopathy following perinatal asphyxia. *Cochrane Database Syst Rev*. 2005;(3):CD004337.
- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.

- Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.
- WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization; 2016.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Gleason CA, Devaskar SU, editors. Avery's diseases of the newborn. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.
- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth Edition. London: Churchill Livingstone Elsevier; 2012.

Quality statement 1.31 NEW: All newborns are assessed and managed for anaemia, including for causes of haemolytic disease of the newborn.

Rationale: Anaemia is defined as a haematocrit or haemoglobin concentration > 2 standard deviations below the mean for age. It is due to three main causes: blood loss, increased red blood cell destruction or reduced red blood cell production. The main effects of anaemia are reduced oxygen delivery to tissues, with clinical symptoms and acute or chronic consequences that include poor growth, decreased activity, limited cardiovascular reserve and adverse effects on cognitive development. Preterm newborns are at particular risk of anaemia if they are born before placental iron transport and fetal erythropoiesis are complete, with low plasma levels of erythropoietin, both reduced production and accelerated catabolism and rapid neonatal growth. Red blood cell loss is increased in preterm infants by infection, bleeding and frequent blood sampling for laboratory testing. Small and sick newborns should be screened and managed for anaemia and its complications and may require blood transfusion.

Haemolytic disease of the newborn, also known as erythroblastosis fetalis, isoimmunization or blood group incompatibility, occurs when fetal red blood cells that have an antigen that the mother lacks, usually Rhesus factor (Rh), cross the placenta into the maternal circulation, where they stimulate antibody production. The antibodies return to the fetal circulation and result in red blood cell destruction and symptoms in the newborn. Administration of anti-D immunoglobulin to Rh-negative women within 72 h of birth to an Rh-positive baby is effective in preventing RhD alloimmunization and haemolytic disease of the newborn.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for assessing and managing anaemia in small and sick newborns.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for managing women who are RhD-negative according to international guidelines.

- The health facility has appropriate laboratory and diagnostic tests available for investigation of newborns with anaemia.
- The health facility has adequate anti-D immunoglobulin for mothers.
- The health facility has adequate medications and supplies for the management of anaemia in newborns.
- The health facility clinical staff who care for small and sick newborns receive training and regular refresher sessions in assessing and managing anaemia in small and sick newborns at least once.

Process or output

- Proportion of all newborns admitted to the health facility who are assessed for anaemia, with a full blood count, haematocrit or point-of-care haemoglobin.
- Proportion of women who are RhD antigen-negative with an RhD-positive baby who are given anti-D immunoglobulin within 72 h of birth.

Outcome

- Proportion of all newborns with anaemia who require a blood transfusion.
- Proportion of newborns who develop alloimmune haemolytic disease of the newborn.

References

- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.
- Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.
- WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization; 2016.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Gleason CA, Devaskar SU, editors. Avery's diseases of the newborn. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.
- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth Edition. London: Churchill Livingstone Elsevier; 2012.

Quality statement 1.32 NEW: Small and sick newborns at risk of necrotizing enterocolitis are assessed and managed according to WHO guidelines.

Rationale: Necrotizing enterocolitis is one of the most common gastrointestinal emergencies in the newborn. It is thought to be caused by a perinatal insult of the immature gut that leads to poor perfusion. The circulatory changes are associated with severe inflammation, mucosal injury, intestinal organisms and milk breaching the mucosal barrier. Necrotizing enterocolitis accounts for substantial long-term morbidity in survivors of neonatal intensive care, particularly in preterm

and very-low-birth-weight infants (< 1500 g). Treatment includes bowel rest and nutrition, ceasing enteral feeds for 10 days, antibiotics for 10 days, attention to fluids and electrolytes, cardiovascular and respiratory support, analgesia and surgery for gut perforation or other complications.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for the prevention, diagnosis and management of necrotizing enterocolitis in newborns.
- The health facility has injectable antibiotics, diagnostics and supplies available for the management of newborns with necrotizing enterocolitis in sufficient quantities at all times for the expected case-load.
- The health facility has access to surgical referral pathways for the management of newborns with necrotizing enterocolitis.
- Health care staff in the health facility who care for newborns receive in-service training and regular refresher sessions in the recognition and management of necrotizing enterocolitis at least once.

Process or output

- Proportion of small and sick newborns in the health facility who are at risk of necrotizing enterocolitis who were managed according to evidence-based guidelines.

Outcome

- Proportion of small and sick newborns in the health facility who are at risk of necrotizing enterocolitis and in whom it develops.
- Proportion of small and sick newborns in the health facility who have necrotizing enterocolitis in whom bowel perforation results.
- Proportion of small and sick newborns in the health facility treated for necrotizing enterocolitis who died (case fatality rate).

References

- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.
- Recommendations for management of common childhood conditions: evidence for technical update of pocket book recommendations: newborn conditions, dysentery, pneumonia, oxygen use and delivery, common causes of fever, severe acute malnutrition and supportive care. Geneva: World Health Organization; 2012.
- Recommendations on newborn health. Geneva: World Health Organization; 2017.
- Gleason CA, Devaskar SU, editors. Avery's diseases of the newborn. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.

- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth Edition. London: Churchill Livingstone Elsevier; 2012.
- Shah D, Sinn JKH. Antibiotic regimens for the empirical treatment of newborn infants with necrotising enterocolitis. Cochrane Database Syst Rev. 2012;(8):CD007448.

Quality statement 1.33 NEW: Small and sick newborns at risk of retinopathy of prematurity are appropriately identified, screened and treated.

Rationale: Retinopathy of prematurity is a disorder of the developing retina of preterm infants that may lead to blindness in a small but significant percentage. In preterm infants, the development of the retina is incomplete, the extent of immaturity of the retina depending mainly on the extent of prematurity at birth and/or associated neonatal morbidity. Oxygen plays a critical role in this process, both hypoxia and hyperoxia affecting levels of growth factors, such as vascular endothelial growth factor, essential for normal retinal vascular development. The rates of retinopathy of prematurity depend on the quality of care received, including oxygen delivery, with continuous monitoring to maintain safe oxygen saturation levels. Retinopathy of prematurity progresses over time; however, there are proven benefits of timely treatment in reducing the risk of visual loss. Effective care now requires that at-risk infants receive carefully timed retinal examinations by an ophthalmologist experienced in examining preterm infants for the condition according to their gestational age at birth or subsequent disease severity.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for the prevention, screening, documentation and treatment of retinopathy of prematurity in small and sick newborns according to guidelines.
- The health facility has access to an ophthalmologist (or an appropriately trained specialist), either within the facility or in a neonatal network, with the competence and skill to screen and treat newborns for retinopathy of prematurity.
- The specialist referral health facility has access to an adequate supply of specialist equipment for screening and treatment of retinopathy of prematurity.
- Health facility clinical staff who care for small and sick newborns receive training and regular refresher sessions in preventing and referring newborns at risk of retinopathy of prematurity at least once.

Process or output

- Proportion of eligible small and sick newborns who are screened for retinopathy of prematurity and the findings are documented.
- Proportion of eligible small and sick newborns who have retinopathy of prematurity who are treated.

- Proportion of all small and sick newborns with retinopathy of prematurity who are regularly reviewed by an ophthalmologist (or an appropriately trained specialist) according to standard guidelines.

Outcome

- Proportion of all small and sick newborns with some degree of retinal detachment.

References

- American Academy of Pediatrics section on ophthalmology, American Academy of Ophthalmology, American Association for Pediatric Ophthalmology and Strabismus, American Association of Certified Orthoptists. Policy statement. Screening examination of premature infants for retinopathy of prematurity. *Pediatrics*. 2013;131(1):189–95.
- Quinn GE. Retinopathy of prematurity blindness worldwide: phenotypes in the third epidemic. *Eye Brain*. 2016;8:31–6.
- Blencowe H, Lawn JE, Vazquez T, Fielder A, Gilbert C. Preterm-associated visual impairment and estimates of retinopathy of prematurity at regional and global levels for 2010. *Pediatr Res*. 2013;74(Suppl 1):35–49.
- Royal College of Paediatrics and Child Health, Royal College of Ophthalmologist, British Association of Perinatal Medicine, BLISS. Guideline for the screening and treatment of retinopathy of prematurity. London: Royal College of Paediatrics and Child Health; 2008.
- Jefferies AL, Canadian Paediatric Society, Fetus and Newborn Committee. Retinopathy of prematurity: an update on screening and management. *Paediatr Child Health*. 2016;21(2):101–8.

Quality statement 1.34 NEW: Small and sick newborns at risk of intraventricular haemorrhage are assessed and managed according to standard guidelines.

Rationale: Intraventricular haemorrhage is the most common type of intracranial haemorrhage in the neonate. It occurs primarily in preterm infants but is occasionally seen in near-term and term infants. The incidence of intraventricular haemorrhage is inversely related to gestation and birth weight. The germinal matrix starts to involute spontaneously in the second trimester, and the process is virtually complete by 32 weeks' gestation, when the risk of haemorrhage is almost nil. There are many risk factors for intraventricular haemorrhage, which include obstetric and perinatal variables. It usually occurs early in postnatal life (75% by 72 h) but may develop in utero or intrapartum. The pathogenesis is hypoperfusion, which is reperfusion injury with venous infarction. Intraventricular haemorrhage results in adverse neurological outcomes.

Intraventricular haemorrhage is often asymptomatic and is diagnosed by cranial ultrasound. The extent of the haemorrhage and the associated ventricular distension and parenchymal involvement are the basis of the Papile classification system, consisting of four grades. Preterm infants < 30–32 weeks of age are often screened between days 5 and 7 of life. A repeated cranial ultrasound around day 28 of life will detect parenchymal abnormalities and/or ventriculomegaly and provide prognostic information for further management.



QUALITY MEASURES

Input

- The referral health facility has written, up-to-date guidelines, protocols and standard operating procedures for preventing, assessing and managing intraventricular haemorrhage according to guidelines.
- The referral health facility has access to cranial ultrasound for diagnosis and interpretation of intraventricular haemorrhage.
- The referral health facility clinical staff who care for newborns receive training and regular refresher sessions in preventing, assessing and managing intraventricular haemorrhage in small and sick newborns at least once.

Process or output

- Proportion of small and sick newborns in the referral health facility who were screened for intraventricular haemorrhage by cranial ultrasound.

Outcome

- Proportion of small and sick newborns in the referral health facility who have intraventricular haemorrhage and develop post-haemorrhagic hydrocephalus.

References

- Vohr BR, Garcia-Coll C, Mayfield S, Brann B, Shaul P, Oh W. Neurologic and developmental status related to the evolution of visual–motor abnormalities from birth to 2 years of age in preterm infants with intraventricular hemorrhage. *J Pediatrics*. 1989;115(2):296–302.
- Volpe JJ. *Neurology of the newborn*. Third edition. Philadelphia (PA): Saunders; 1995:403–63.
- Al-Abdi SY, Al-Aamri MA. A systematic review and meta-analysis of the timing of early intraventricular hemorrhage in preterm neonates: clinical and research implications. *J Clin Neonatol*. 2014;3(2):76–88.
- Gleason CA, Devaskar SU, editors. *Avery's diseases of the newborn*. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.

Quality statement 1.35: All referred newborns with surgical conditions are screened for surgical emergencies and injury and receive appropriate surgical care.

Rationale: Congenital abnormalities in newborns may require urgent surgical attention, while others should be left until the child is older. Early recognition results in better outcomes and gives parents options for treatment. Injured newborns should be reviewed immediately to determine whether an intervention is required.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for emergency triage and assessment and appropriate case management of neonatal injury and surgical conditions, consistent with WHO guidelines.
- The health facility that provides surgical care for neonates has a system to ensure a coordinated multidisciplinary team that includes a health professional with competence and skills in neonatal surgery.
- Health professionals receive in-service training and refresher sessions in appropriate care of neonatal injuries, trauma and other common neonatal surgical conditions at least once.
- The health facility has a designated area for the management of newborns with surgical problems by health professionals who are trained or who have knowledge and skills in neonatal care.
- All newborns who have undergone surgery are closely monitored, with careful documentation of intake (fluids and feeds) and output (e.g. urine, nasogastric drainage).

Process or output

- Proportion of newborns undergoing major surgery who received appropriate perioperative antibiotic prophylaxis within 30 min of incision, when indicated.
- Proportion of all newborns undergoing surgery who were admitted to a designated neonatal area staffed by health professionals trained in neonatal care.
- Proportion of all newborns with trauma or injuries who were assessed within 15 min of arrival at the health facility.
- Proportion all newborns with moderate or severe pain whose pain was relieved (where indicated) within 30 min of arrival at the health facility.

Outcome

- Proportion of newborns who underwent surgery who developed complications in the health facility.
- Proportion of newborns who underwent surgery who died.

References

- Paediatric emergency triage, assessment and treatment: care of critically ill children. Geneva: World Health Organization; 2016.
- Emergency triage assessment and treatment (ETAT)[¶]. Geneva: World Health Organization; 2005.

B4. Clinical monitoring and supportive care

Quality statement 1.36: Small and sick newborns, especially those who are most seriously ill, are adequately monitored, appropriately reassessed and receive supportive care according to WHO guidelines.

Quality statement 1.37 NEW: Small and sick newborns are given antibiotics and other medications only if indicated, by the correct route and of the correct composition; the dose is calculated, checked and administered, the need for medication is regularly reassessed, and any adverse reaction is appropriately managed and recorded.

Quality statement 1.38 NEW: Small and sick newborns who cannot tolerate full enteral feeds are given intravenous fluids containing glucose or safe, appropriate parenteral nutrition; fluids are administered through an infusion pump and a neonatal burette, the volume is recorded, and the intravenous site is checked with other routine observations.

Quality statement 1.39 NEW: Small and sick newborns are given blood transfusions when indicated, the blood given is appropriate, the volume is recorded, and the newborn is monitored before, during and after the transfusion.

Rationale: Monitoring the clinical course of small and sick newborns and their response to treatment is an essential element of clinical care, as newborns are at particular risk of hypothermia, hypoglycaemia and infection. All small and sick newborns should be provided with supportive care and closely monitored. The clinical progress and care, including developmental supportive care, should be documented routinely at regular intervals, including vital signs, the care provided and medications, feeds and fluids administered. Potential complications should be anticipated and the condition of the newborn checked regularly for any deterioration, complications or adverse treatment outcomes. The frequency of monitoring depends on the newborn's condition and its severity.

Small and sick newborns may require support for feeding from a cup or by nasogastric tube. The health facility should ensure that all newborns are exclusively breastfed or provided with their mother's breast milk as much as possible. Newborns who cannot tolerate enteral feeding or for whom enteral feeding is contraindicated are provided with safe parenteral nutrition in the correct amount and composition, with close monitoring.

Small and sick newborns who require supportive care, such as oxygen, pain control, intravenous fluids and blood transfusions, should be given these only when indicated. Attention to safe, rational use of antibiotics and other medications, safe use of intravenous fluids and safe blood transfusion is particularly important for small and sick newborns. Medication doses and fluid volumes are based on the newborn's weight, and an incorrect weight or measurement error can lead to administration of an inappropriate dose or volume. Medications are administered as per standard procedures to avoid serious adverse events.

The volumes and rates of administration of intravenous fluids and blood through neonatal burettes, infusion pumps and intravenous lines must be strictly monitored to avoid fluid overload. Blood for small and sick newborns should be as fresh as possible, irradiated, negative for cytomegalovirus and warmed for administration, and the newborn should be assessed and managed for transfusion reactions.



QUALITY MEASURES FOR CLINICAL MONITORING AND SUPPORTIVE CARE

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for monitoring and providing supportive care for all small and sick newborns admitted to the wards.
- The health facility has monitoring charts that include provision for recording details of clinical progress, vital signs and growth and of the treatment and supportive care provided.
- The health facility has a designated area for managing seriously sick newborns that is close and easily visible to the nursing staff on the neonatal ward.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures on safe and rationale use of antibiotics and other medications for small and sick newborns according to weight or age.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for safe use of intravenous fluids and parenteral nutrition in selected critically ill neonates.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for safe blood transfusion for small and sick newborns, including indications for use, appropriate blood storage and monitoring before, during and after transfusion, and transfusion reactions are managed and recorded.
- The health facility has instructions for newborn-specific dosage and charts and electronic calculators to assist health professionals who care for small and sick newborns in selecting and administering correct doses of intravenous fluids and medication to newborns.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for the prevention, monitoring, detection and management of extravasation tissue injuries resulting from infusions.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for the prevention, monitoring, detection and management of complications related to health care equipment, devices and practices, including skin erythema, skin breakdown, pressure sores, nasal trauma and tissue injury.
- Health professionals receive in-service training and regular refresher sessions on newborn monitoring and supportive care at least once.

Process or output

- Proportion of small and sick newborns admitted to the health facility who were appropriately monitored by a nurse according to the guidelines.
- Proportion of small and sick newborns admitted to the health facility for whom observations were recorded by a nurse according to the guidelines.
- Proportion of small and sick newborns admitted to the health facility who are reassessed every day by a clinician trained in newborn care.
- Proportion of small and sick newborns admitted to the health facility who received oxygen for which the prescribed method and rate of delivery are documented.
- Proportion of small and sick newborns for whom blood glucose levels are measured, documented and monitored correctly.
- Proportion of small and sick newborns admitted to the health facility given the correct dose of medication according to evidence-based guidelines.

Outcome

- Proportion of sick and small newborns in whom complications related to health care practices developed, including skin erythema, skin breakdown, pressure sores, nasal trauma and intravenous fluid extravasation.

References

- Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. Second edition. Geneva: World Health Organization; 2013.
- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.
- Gleason CA, Devaskar SU, editors. Avery's diseases of the newborn. Ninth edition. Philadelphia (PA): Elsevier Saunders; 2012.
- Rennie JM, editor. Rennie and Robertson's textbook of neonatology. Fifth Edition. London: Churchill Livingstone Elsevier; 2012.

B5. Pain management and palliative care

Quality statement 1.40: All small and sick newborns are assessed routinely for pain or symptoms of distress and receive appropriate management according to WHO guidelines.

Rationale: Studies have shown that pain affects brain development, with potential long-term effects. Health care providers should recognize pain cues and know how to prevent and minimize pain in newborns. Appropriate tools are recommended for assessing pain and making decisions on pain management and comfort. Studies have shown that comfort is improved when newborns are encouraged to breastfeed or placed skin-to-skin with a family member. Oral sucrose may be used during potentially painful procedures, such as blood sampling heel pricks. For sicker newborns, analgesics with appropriate monitoring may be necessary.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures and tools for the assessment, recognition, prevention and management of pain in small and sick newborns.
- The health facility uses individual plans for pain treatment or non-pharmacological strategies to reduce pain and relieve distressing symptoms in small and sick newborns.
- The health facility has protocols and procedures in place to support the safe storage and use of pain-control medicines, and conducts regular audits of pain management.
- The health staff receive training and regular refresher courses in assessing, preventing and controlling pain in small and sick newborns.

Process or output

- Proportion of newborns in the health facility with a documented pain assessment.
- Proportion of newborns who were breastfed, placed skin-to-skin with a family member or given oral sucrose during blood sampling or other painful procedures.
- Proportion of health professionals in the health facility who know how to perform both pharmacological and non-pharmacological interventions to manage pain in small and sick newborns.
- Proportion of staff in the health facility who have received training or refresher training in managing pain in small and sick newborns at least once.

Outcome

- Proportion of parents or carers who reported that their newborns' pain or symptoms of distress were alleviated by the action of health workers.

References

- Carter BS, Brunkhorst J. Neonatal pain management. *Semin Perinatol*. 2017;41(2):111–6.
- Committee on Fetus and Newborn, Section on Anesthesiology and Pain Medicine. Prevention and management of procedural pain in the neonate: an update. *Pediatrics*. 2016;137(2):e20154271.
- Pillai Riddell RR, Racine NM, Gennis HG, Turcotte K, Uman LS, Horton RE, et al. Non-pharmacological management of infant and young child procedural pain. *Cochrane Database Syst Rev*. 2015;(12):CD006275.
- Stevens B, Yamada J, Lee GY, Ohlsson A. Sucrose for analgesia in newborn infants undergoing painful procedures. *Cochrane Database Syst Rev*. 2013;(1):CD001069.
- Foster JP, Taylor C, Spence K. Topical anaesthesia for needle-related pain in newborn infants. *Cochrane Database Syst Rev*. 2017;(2):CD010331.

- Johnston C, Campbell-Yeo M, Disher T, Benoit B, Fernandes A, Streiner D, et al. Skin-to-skin care for procedural pain in neonates. Cochrane Database Syst Rev. 2017;(2):CD008435.
- Weston PJ, Harris DL, Battin M, Brown J, Hegarty JE, Harding JE. Oral dextrose gel for the treatment of hypoglycaemia in newborn infants. Cochrane Database Syst Rev. 2016;(5):CD011027.

Quality statement 1.41 NEW: Small and sick newborns have access to appropriate palliative care.

Rationale: Most newborn deaths are of very preterm babies, those with serious infections and those with severe hypoxic ischaemic encephalopathy or congenital abnormalities. Newborns are entitled to a dignified, pain-free death. Newborns should be allowed to die with their families, in a private, quiet space; parents should be given the opportunity to hold their baby before and at the end of life. Good-quality, compassionate bereavement care, including psychological and spiritual support, after a newborn dies reduces the negative emotional, psychological and social effects on parents and staff. Culturally appropriate steps to preserve a newborn's memory and to support mothers in stopping breast milk should be provided.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for newborns who require palliative care and for psychological and spiritual support of their carers.
- The health facility has adequately trained staff to provide palliative care to newborns.
- Health care staff in the health facility who care for newborns receive training and regular refresher sessions in end-of-life and bereavement care at least once.

Process or output

- Proportion of newborns who die in a private, quiet place with their parents or carers.
- Proportion of carers of newborns who were allowed to hold their baby before or at the end of life.
- Proportion of carers of newborns who were offered culturally appropriate means to preserve their newborn's memory.
- Proportion of newborns in the health facility who required palliative care who received it or were referred to an appropriate centre.
- Proportion of carers who experienced the death of their newborn who received follow-up counselling or support.

References

- Planning and implementing palliative care services: a guide for programme managers. Geneva: World Health Organization; 2016.
- Marc-Aurele KL, English NK. Primary palliative care in neonatal intensive care. *Semin Perinatol.* 2017;41(2):133–9.
- Kenner C, Press J, Ryan D. Recommendations for palliative and bereavement care in the NICU: a family-centered integrative approach. *J Perinatol.* 2015;35(Suppl 1):S19–23.
- End of life care for infants, children and young people with life-limiting conditions: planning and management. Clinical guideline. London: National Institute for Health Care and Excellence; 2016.
- End of life care for infants, children and young people. Quality standard. London: National Institute for Health Care and Excellence; 2017.

B6. Care and advice at discharge

Quality statement 1.42 NEW: Small and sick newborns are discharged from hospital when home care is considered safe and carers have received a comprehensive discharge management plan and are competent in the care of their newborn.

Rationale: WHO has provided global guidelines on postnatal care for mothers and newborns, which address the timing and content of postnatal care in low- and middle-income countries. Small and sick newborns may require additional follow-up to assess recovery, feeding and weight gain and to monitor health and neurodevelopmental progress. Some newborns may require follow-up appointments with medical specialists (ophthalmology, neurology, cardiology, surgery) and allied health professionals (nutrition, speech therapy, physiotherapy, occupational therapy, audiology). Discharge of preterm newborns is recommended when they are gaining weight, maintaining temperature, breastfeeding well and the mother is confident in caring for the baby and can attend follow-up visits. Similar criteria can be applied to mature newborns recovering from illness. A routine pre-discharge baby check, facilitated by a standard proforma, will detect any additional problems that require follow-up and reassure carers. Parents and carers should be educated and trained to build their confidence in caring for their newborns at home.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for discharge of newborns, including a pre-discharge baby check, a comprehensive discharge management plan and arranging follow-up as required.

- Health care staff in the health facility who care for small and sick newborns receive in-service training and regular refresher sessions in discharge planning and follow-up at least once.

Process or output

- Proportion of all newborns who have had a pre-discharge baby check to identify any problems that require follow-up.
- Proportion of carers of small and sick newborns who receive a comprehensive discharge management plan with follow-up, which is recorded in the case file.
- Proportion of carers of newborns who are given a training programme on discharge to help them become confident carers.
- Proportion of carers of newborns who have been counselled on discharge about breastfeeding or alternative feeding, danger signs in the newborn and when to return to the health facility.
- Number of completed home visits documented in the discharge management plan.

Outcome

- Proportion of carers of newborns who report on discharge that they know about breastfeeding or alternative feeding, danger signs in the newborn and when to return to the health facility.
- Proportion of discharged small and sick newborns who are referred for follow-up who attend scheduled follow-up appointments.
- Proportion of discharged small and sick newborns who are readmitted to the health facility within 1 month of discharge.

References

- Recommendations on postnatal care of the mother and newborn. Geneva: World Health Organization; 2013.
- Optimal feeding of low-birth-weight infants: technical review. Geneva: World Health Organization; 2006.
- American Academy of Pediatrics Committee on Fetus and Newborn. Hospital discharge of the high-risk neonate, Pediatrics. 2008;122(5):1119–26.
- Developmental follow-up of children and young people born preterm. Quality standard. London: National Institute for Health Care and Excellence; 2018.
- Developmental follow-up of children and young people born preterm. Clinical guideline. London: National Institute for Health Care and Excellence; 2017.



STANDARD 2

ACTIONABLE HEALTH INFORMATION SYSTEMS

Standard 2: The health information system enables collection, analysis and use of data to ensure early, appropriate action to improve the care of every small and sick newborn.

Rationale: Vital information on small and sick newborns should be recorded and registered for appropriate decision-making and to maximize patient safety and quality of care. A medical record that includes details of the pregnancy and delivery and a clinical observation chart with a minimal set of observations should be available, including the frequency of observations specific for newborns. A standard proforma that can be completed accurately for each newborn is the best means of collecting such information. A mechanism should be available for data collection that includes sub-national and national indicators specific for newborns to be used in policy and planning for monitoring performance, quality improvement and health outcomes. Health facilities should have a system for collecting and analysing data and providing feedback on the services provided and the perception of families of the care received. Newborn and perinatal deaths should be reviewed to ensure professional best practice and improve the quality of care.

Quality statement 2.1: Every small and sick newborn has a complete, accurate, standardized, up-to-date medical record, which is accessible throughout their care, on discharge and on follow-up.



QUALITY MEASURES

Input

- The health facility has standardized registers, clinical records, observation charts, patient cards and data collection forms in place at all times for recording and monitoring all newborn care processes and outcomes, including kangaroo mother care.
- The health facility has an established storage system for patients' medical records that ensures confidentiality and safety and allows rapid retrieval, access and distribution.
- The health facility has a standardized system for classifying clinical conditions, diseases and health outcomes, including births and deaths, which is aligned with the International Classification of Diseases.
- The health facility has a system for creating unique identifiers for new patients and locating the unique identifiers of returning patients.
- The health facility has sufficient supplies of the necessary registers, patient medical forms, charts and patient cards (e.g. immunization cards) in stock at all times.
- The health facility staff who manage small and sick newborns receive training and refresher sessions at least once on the use of standardized medical records, including birth and death registers, and on classification of conditions and diseases in accordance with the International Classification of Diseases.

Process or output

- Proportion of newborns who are discharged with an accurately completed record.
- Proportion of newborns who have a patient identifier and an individual clinical medical record.

Outcome

- Proportion of health facility staff who manage small and sick newborns who have adequate knowledge of the use of standardized medical records, including birth and death registers, and classification of conditions and diseases in accordance with the International Classification of Diseases.

Quality statement 2.2: Every health facility has a functional mechanism for collecting, analysing and using data on newborns as part of monitoring performance and quality improvement.



QUALITY MEASURES

Input

- The health facility has a system with standard operating procedures and protocols for data collection and for checking, validating and analysing relevant indicators to make timely reports and visual charts.
- The health facility staff has appropriate training in standard operating procedures and protocols for data collection and for checking, validating and analysing relevant indicators.

Process or output

- Proportion of all perinatal and neonatal deaths that occurred in the health facility in the previous three months that were reviewed with standard auditing tools.
- Number of months in a year in which data quality reviews were conducted.
- Number of meetings held between health facility clinical staff and managers in the previous year to review patient care and outcomes for decision-making and monitoring performance.
- Number of meetings held between health facility managers and community representatives in the previous year to review the health facility statistics and performance.

Outcome

- Proportion of neonatal deaths that were reviewed for which appropriate recommendations of the reviews were implemented.

Quality statement 2.3: Every health facility has a mechanism for collecting, analysing and providing feedback on the newborn services provided and the perception of families of the care received.



QUALITY MEASURES

Input

- The health facility has a functioning system and procedures in place for collecting information and responding to the perceptions of carers of small and sick newborns of the services provided.
- The health facility has visual materials to inform carers of small and sick newborns on making a complaint (e.g. a suggestion box) and providing feedback to the health facility.
- Health facility staff (clinical and nonclinical) receive training or orientation in customer service and provision of family-centred care at least once.

Process or output

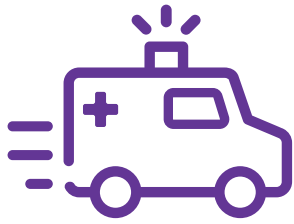
- Proportion of carers of small and sick newborns who are aware of the mechanism for patient complaints and feedback (e.g. suggestion box) in the health facility.
- Proportion of carers of small and sick newborns who participated in patient satisfaction surveys or provided feedback on the services received in the previous three months.
- Proportion of all complaints from carers of small and sick newborns received by the health facility in the previous six months that were reviewed and acted upon.

Outcome

- Proportion of carers of small and sick newborns who are satisfied with the time they spent waiting for care, the procedures and other processes in the health facility.

References

- Making every baby count: audit and review of stillbirths and neonatal deaths. Geneva: World Health Organization; 2016.
- WHO technical consultation on newborn health indicators: every newborn action plan metrics. Geneva: World Health Organization; 2015.
- Moxton SG, Guenther T, Gabrysch S, Enweronu-Laryea C, Ram PK, Niermeyer S, et al. Service readiness for inpatient care of small and sick newborns: what do we need and what can we measure now? *J Glob Health*. 2018;8(1):010702.
- Service availability and readiness assessment. An annual monitoring system for service delivery. Reference manual. Version 2.2. Geneva: World Health Organization; 2015.
- Gabrysch S, Civitelli G, Edmond KM, Mathai M, Ali M, Bhutta SA, et al. New signal functions to measure the ability of health facilities to provide routine and emergency newborn care. *PLoS Med*. 2012;9(11):1001340.



STANDARD 3

FUNCTIONING REFERRAL SYSTEMS

Standard 3: Every small and sick newborn with a condition or conditions that cannot be managed effectively with the available resources receives appropriate, timely referral through integrated newborn service pathways, with continuity of care, including during transport.

Quality statement 3.1: Every small and sick newborn who requires referral receives appropriate pre-referral care, and the decision to refer is made without delay.

Rationale: Small, sick and some preterm newborns and those who require further or specialized care may have to be referred to a higher-level facility. Health care providers should be competent to determine which life-threatening cases require urgent referral to ensure appropriate, timely referral with no unnecessary delay. The decision to refer should be made as soon as a condition that requires referral is identified. The newborn is first stabilized, the appropriate pre-referral treatment is given, and the newborn is then urgently transferred to the receiving facility. Once the decision to refer is made, carers should be informed and their concerns addressed, and the receiving facility should be informed and appropriate transport organized.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for pre-referral management of all small and sick newborns who require referral.
- The health facility is equipped with age-appropriate medicines and other supplies for stabilization and pre-referral treatment of small and sick newborns who require referral.
- The health facility has at least one health professional on duty at all times who is trained and competent in first aid, emergency triage, assessment and treatment or basic newborn life support.

Process or output

- Proportion of all small and sick newborns in a health facility who require referral who are given pre-referral treatment and transferred to the referral health facility in a timely manner.
- Proportion of family members who report receiving appropriate information about the condition of their baby and about why and where the baby will be referred for further care.
- Proportion of newborns seen in the health facility within the previous three months who fulfilled the facility's criteria for referral and who were actually transferred to a referral facility.

Outcome

- Proportion of newborns in a health facility who fulfilled the criteria for referral who died or developed further complications because of inappropriate referral.

Quality statement 3.2: Every small and sick newborn who requires referral receives seamless, coordinated care and referral according to a plan that ensures timeliness.

Rationale: A pre-established plan for referral expedites the process, prevents unnecessary delay and results in timely care and better outcomes. Health facilities should standardize their plans and coordinate with other facilities in the network to determine which facilities receive which newborns. Staff should be aware of the alternatives if the usual receiving facility cannot accept a newborn. Communication with the referral facility before transfer is essential, so that the appropriate arrangements can be made to receive the newborn. The health facility should have up-to-date, readily accessible referral protocols and guidelines that reflect the health facility's capacity and resources. A list of facilities in the network and their telephone numbers should be available, and the referral system should be supervised and accountable, with a policy to protect newborns and their families from financial barriers to referral.



QUALITY MEASURES

Input

- The health facility is part of a referral network of facilities in the same geographical area, with agreed arrangements.
- The health facility has an up-to-date list of facilities in the network that provide referral services.
- The health facility has a functioning vehicle with fuel or proximate access to a vehicle that is routinely available for emergency transport to referral facilities.
- The health facility has local financial arrangements to ensure that newborns who cannot be managed at the health facility are referred and transferred with their parent or caregiver without delay, 24 h a day, 7 days a week.

Process or output

- Proportion of newborns who were referred without appropriate emergency transport.
- Proportion of all newborns who required referral who were transferred to a receiving facility accompanied by a health care professional.
- Proportion of newborns referred to a referral health facility or their carers who reported receiving immediate attention (within 15 min) on arrival at the referral health facility.

Outcome

- Proportion of newborns who were referred without appropriate emergency transport who develop complications or die.

Quality statement 3.3: For every newborn referred or counter-referred within or between health facilities, there is appropriate information exchange and feedback to relevant health care staff.

Rationale: Efficient communication channels among facilities in a referral network are vital for appropriate information exchange and feedback. Good communication improves patient care, increases the motivation of health care providers, facilitates learning from experience and improves patient outcomes. Network facilities should standardize and agree on sharing of information on patients and on quality improvement mechanisms, including education of referring facility staff by proactive mentoring and support. A functioning communication system (e.g. radio, telephone, pagers) should be in place in the referral network. Information exchange and feedback protocols and standardized referral and counter-referral forms should be available and accessible at all times. On counter-referral, the receiving facility should send information about the services and care provided and any follow-up required.



QUALITY MEASURES

Input

- The health facility has a standardized referral form for documenting relevant demographic and clinical information (summary of medical history, clinical findings, investigations, diagnosis and treatment given) and the reason for referral.
- The health facility has reliable methods of communication (mobile phone, landline or radio) that are functioning at all times for facilitating referrals.
- The health facility has formal agreements, communication arrangements and a feedback system with the referral facilities in the network.

Process or output

- Proportion of all newborns referred by a health facility for whom written counter-referral feedback information was provided by the receiving facility.
- Proportion of all newborns referred who had an appropriate referral note.

Outcome

- Proportion of newborn transfers from the facility for whom there is a complete transfer form, with clinical notes, including timely reception of diagnostic test results.

Quality statement 3.4 NEW: Every health facility that provides care for small and sick newborns has been designated according to a standardized level of care and is part of an integrated network with clear referral pathways, a coordinating referral centre that provides clinical management support, protocols and guidelines.

Rationale: The concept of providing risk-appropriate care for newborn infants and mothers and referral of high-risk patients to higher-level centres with the appropriate resources and staff skills mix emerged almost 50 years ago to address the increasing complexity of care. There is strong evidence from high-income countries that stratification of maternal and neonatal care and the availability of neonatal intensive care have improved the outcomes of high-risk infants born either preterm or with serious medical or surgical conditions; however, evidence from low- and middle-income settings is limited. In high-income countries, newborn services in a health jurisdiction are usually organized in a network, so that the catchment population has access to both locally provided services and highly specialized services in tertiary hospitals (e.g. intensive care) and children's hospitals (e.g. surgical services).

Inpatient care for newborns is usually provided for three levels of complexity: primary or level 1 (basic care), secondary or level 2 (special care) and tertiary or level 3 (neonatal intensive care). Studies published between the 1980s and the 2000s showed that larger regional neonatal centres with more activity were associated with better outcomes. High-income countries have provided guidance on levels of care, with definition of the minimal requirements for appropriate personnel, physical space, technology and organization. Criteria have been set on the gestational age and weight of newborns to be cared for at each level. Low- and middle-income countries have also introduced levels of care for maternal and newborn service delivery.



QUALITY MEASURES

Input

- The health facility has an administrative directive that provides evidence of the standardized level of care that the health facility can provide within an integrated newborn network.
- The health facility has written perinatal guidelines and care pathways, with criteria for admission, discharge, management and referral in utero and of small and sick newborns within the maternity and newborn network.
- The health facility staff have access to a coordinating referral centre that provides clinical management support.

Process or output

- Proportion of small and sick newborns in the health facility who require intensive care who receive it in an appropriate neonatal intensive care unit in the network.

- Proportion of newborns in the health facility who require neonatal surgery who receive it in a designated surgical centre in the network.
- Proportion of newborns in the health facility with a congenital abnormality who require immediate management who are transferred to a specialized network centre according to guidelines.

Outcome

- Proportion of all small and sick newborns in the health facility with an indication that requires referral who died before or during transfer to a specialized facility.
- Proportion of small and sick newborns referred from the health facility who were stable after referral was completed.

References for quality statements 3.1, 3.2, 3.3 and 3.4

- March of Dimes, Committee on Perinatal Health. Toward improving the outcome of pregnancy: recommendations for the regional development of maternal and perinatal health services. White Plains (NY): March of Dimes National Foundation; 1976.
- American Academy of Pediatrics Committee on Fetus and Newborn. Policy statement. Levels of neonatal care. *Pediatrics*. 2012;114(5):1341.
- Rashidian A, Omidvari AH, Vali Y, Mortaz S, Yousefi-Nooraie R, Jafari M, et al. The effectiveness of regionalization of perinatal care services – a systematic review. *Public Health*. 2014;128(10):872–85.
- National Health Service, Department of Health. Toolkit for high quality neonatal services. London: Department of Health; 2009.
- Australasian Health Facility Guidelines. Part B – Health Facility Briefing and Planning 0390 – Intensive Care – Neonatal Special Care Nursery. Sydney: Australasian Health Infrastructure Alliance; 2015.
- Neonatal specialist care. Quality standard. London: National Institute for Health Care and Excellence; 2010.
- Stark AR, American Academy of Pediatrics Committee on Fetus and Newborn. Levels of neonatal care. *Pediatrics*. 2004;114(5):1341–7.
- American Academy of Pediatrics Committee on Fetus and Newborn. Policy statement. Levels of neonatal care. *Pediatrics*. 2012;130(3): 587–97.
- Lasswell SM, Barfield WD, Rochat RW, Blackmon L. Perinatal regionalization for very low-birth-weight and very preterm infants: a meta-analysis. *JAMA*. 2010;304:992–1000.
- Neonatal intensive care review: strategy for improvement. London: Department of Health; 2003.
- Marlow N, Bennett C, Draper ES, Hennessy EM, Morgan AS, Costeloe KL. Perinatal outcomes for extremely preterm babies in relation to place of birth in England: the EPICure 2 study. *Arch Dis Child Fetal Neonatal Ed*. 2014;99:F181–8.
- Service standards for hospitals providing neonatal care. Third edition. London: British Association of Perinatal Medicine; 2010.
- Optimal arrangements for neonatal intensive care units in the UK including guidance on their medical staffing. A framework for practice. London: British Association of Perinatal Medicine; 2014.

- Neonatal care in Scotland: a quality framework. Edinburgh: Scottish Government; 2013.
- All Wales neonatal standards. Second edition. Pontypridd: Welsh Health Specialised Committee; 2013.
- Model of care for neonatal services in Ireland. Dublin: National Clinical Programme for Paediatrics and Neonatology; 2015.
- Toolkit for setting up special care units, stabilisation units and newborn care units. New Delhi: UNICEF India; 2009.
- Indian public health standards. New Delhi: Directorate General of Health Services, Ministry of Health and Family; 2012.
- Guidelines for the care of all newborns in district hospitals, health centres and midwife obstetric units in South Africa. Routine care at birth and management of the sick and small newborn in hospital. Pretoria: Department of Health; 2014.

Quality statement 3.5 NEW: Newborn transfer services provide safe, efficient transfer to and from referral neonatal care by experienced, qualified personnel, preferably specialist transport teams, in specialist transport vehicles.

Rationale for quality statements 3.5 and 3.6: Transfer in utero to a centre equipped to manage small and sick newborns is optimal; however, not all preterm deliveries or deliveries of sick term babies or those with congenital abnormalities can be anticipated. Use of specialized paediatric teams for transporting sick children between facilities has been associated with better outcomes and safety than transport by non-specialized teams. The American Academy of Pediatrics has provided guidance on neonatal and paediatric transport.

In high-income countries, paediatric and neonatal transport is an expanding discipline. In 2013, the American Academy of Pediatrics reviewed practice and issued a consensus document outlining areas to be improved and defining quality, accreditation, training and simulation, safety, clinical research, work practices and team composition. A Cochrane review of randomized trials on the effects of specialist neonatal transport teams on infant morbidity and mortality in 2015 had inconclusive results. A systematic review of neonatal transport in developing countries in 2016 provided support for establishing neonatal transport services to ensure equitable, widespread access to high-quality care for newborns but recognized that it would require substantial input. Newborns who are sufficiently stable should be transported in the kangaroo mother care position with the mother. kangaroo mother care is the safest way to transfer newborns between and within health facilities, as it reduces neonatal mortality, infection and sepsis and prevents hypothermia and hypoglycaemia.



QUALITY MEASURES FOR QUALITY STATEMENT 3.5

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for safe, efficient transfer to and from referral neonatal care that include transferring the newborn in the kangaroo mother care position with their mother when possible.
- The health facility clinical staff have appropriate knowledge and skills for safe, efficient transfer to and from referral neonatal care.
- The health facility has a functioning communication system for exchanging information among relevant service providers during newborn transport that reaches all critical staff 24 h a day, 7 days a week.
- The health facility has a mechanism to ensure that carers and parents are informed of the transfer arrangements for their newborn.
- The health facility has access to specialist transport vehicles that are fully equipped, in good working order and with a competent driver 24 h a day, 7 days a week
- The health facility clinical staff who transfer small and sick newborns receive training and regular refresher sessions at least once every 12 months

Process or output

- Proportion of newborns who are transferred with the mother.

Outcome

- Proportion of newborns who are transferred who arrived at or from the referral centre with an admission temperature $< 36.5^{\circ}\text{C}$.
- Proportion of newborns who are transferred who arrived at or from the referral centre with blood glucose level $< 2.5\text{ mmol/L}$ (45 mg/dL).

Quality statement 3.6 NEW: Every newborn who requires referral is transferred in the kangaroo mother care position with their mother when possible.



QUALITY MEASURES FOR QUALITY STATEMENT 3.6

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for safe, efficient transfer to and from referral neonatal care that include transferring the newborn in the kangaroo mother care position with their mother when possible.
- The health facility clinical staff have appropriate knowledge and skills for safe, efficient transfer to and from referral neonatal care in the kangaroo mother care position.
- The health facility has a mechanism to ensure that the mother, father or carer knows how to safely transfer their newborn in the kangaroo mother care position.
- Health facility clinical staff who transfer small and sick newborns receive training and regular refresher sessions on kangaroo mother care, including transfer in the kangaroo mother care position, at least once every 12 months.

Process or output

- Proportion of newborns who are transferred in the kangaroo mother care position with the mother.

Outcome

- Proportion of newborns who are transferred who arrive at or from the referral centre with an admission temperature $< 36.5^{\circ}\text{C}$.
- Proportion of newborns who are transferred who arrive at or from the referral centre with a blood glucose level $< 2.5\text{ mmol/L}$ (45 mg/dL).

References for quality statements 3.5 and 3.6

- Orr RA, Felmet KA, Han Y, McCloskey KA, Dragotta MA, Bills DM, et al. Pediatric specialized transport teams are associated with improved outcomes. *Pediatrics*. 2009;124(1):40–8.
- Woodward GA, Insoft RM, Kleinman ME. Guidelines for air and ground transport of neonatal and pediatric patients. Third edition. Elk Grove Village (IL): American Academy of Pediatrics; 2007.
- Stroud MH, Trautman MS, Meyer K, Moss MM, Schwartz HP, Bigham MT, et al. Pediatric and neonatal interfacility transport: results from a national consensus conference. *Pediatrics*. 2013;132(2):359–66.
- Chang ASM, Berry A, Jones LJ, Sivasangari S. Specialist teams for neonatal transport to neonatal intensive care units for prevention of morbidity and mortality. *Cochrane Database Syst Rev*. 2015;(10):CD007485.
- Pan-American Health Organization, Latin American Center for Perinatology, Women and Reproductive Health. Neonatal transport in developing country settings: a systematic review. Montevideo; 2016 (CLAP/WR Scientific publication, 1605–02).



STANDARD 4

EFFECTIVE COMMUNICATION AND MEANINGFUL PARTICIPATION

Standard 4: Communication with small and sick newborns and their families is effective, with meaningful participation, and responds to their needs and preferences, and parental involvement is encouraged and supported throughout the care pathway.

Quality statement 4.1: All carers of small and sick newborns are given information about the newborn's illness and care, so that they understand the condition and the necessary treatment.

Rationale: Parents and caregivers of small and sick newborns may find the hospital experience stressful and report anxiety and loss of control. Feelings of helplessness, anxiety, depression and fear may reduce their confidence in caring for their baby during hospital admission and upon discharge. Families often feel excluded from involvement in the care of their small or sick newborn because of distance from home and family, lack of communication with staff and fear of technology. In low-income settings, additional barriers include unclean facilities, insufficient medications or services, staff unfriendliness, costs of care and poor infant outcomes. Preterm birth is a traumatic event, which disrupts parents' expectations of parenthood. They are uncertain about the newborn's outcome, which can affect realization of their parental roles and lead to problems in interaction and attachment. Information about their newborn should be provided with empathy and in a psychologically and culturally appropriate way. Effective communication requires access to translation and interpretation services for families who do not speak the dominant language, so that they receive appropriate information and can ask questions and participate in decision-making about their newborn.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for promoting interpersonal communication and counselling to ensure that families receive appropriate information about their newborn's care and other relevant aspects during their stay in the facility.
- The health facility provides families with health information materials that are accessible, in the relevant language(s) and in appropriate formats (e.g. audio-visual or visual material, diagrams and illustrations) to facilitate understanding by carers of small and sick newborns.
- The health facility provides culturally appropriate information materials to families to help them understand the newborn's condition, opportunities for engagement and participation in the care of their baby and the roles of the different members of the health care team.
- The health facility has an up-to-date, written policy and provisions to ensure that all staff are identifiable, with name badges, and that they always introduce themselves to carers.
- The health facility has access to translation and interpretation services for families to ensure that they receive the appropriate information and can ask questions and participate in decision-making regarding their newborn.
- Health care staff receive training and regular mentoring or refresher training in communication and counselling at least once.

Process or output

- Proportion of health care staff, by cadre, and social professionals who received training in communication and counselling.
- Proportion of health care staff, by cadre, and social professionals who received supportive supervision in communication and counselling.
- Proportion of health care staff in the health facility who wear identification badges.

Outcome

- Proportion of health care staff in the health facility who demonstrate good communication skills.
- Proportion of carers who report that they were satisfied with the quality of the health information and support they received from health care staff during the care of their newborn.
- Proportion of carers of small and sick newborns who report having participated in ward rounds.
- Proportion of carers who consider that they were given the information they required in a timely, respectful manner.

Quality statement 4.2: All small and sick newborns and their carers experience coordinated care, with clear, accurate information exchange among relevant health and social care professionals and other staff.

Rationale: Several health and allied health professionals may be involved in the care of small and sick newborns. Regular, accurate information exchange will avoid miscommunication among professionals and also among health professionals and carers or parents. Accurate information exchange should be provided to carers and parents during referral, as this is a sensitive time, and information will avoid confusion and anxiety. Communication needs should be defined for health professionals, parents and carers and for interactions with the newborn.



QUALITY MEASURES

Input

- The health facility has a written, up-to-date, structured, standard form for written handover of newborns among care teams at shift changes or during transfer among facilities.
- The health facility has a written protocol for verbal and written handovers, including for shift change, transfer among facilities, referral, discharge and follow-up.
- The health facility has a functioning communication system for the exchange of information among relevant service providers that reaches all critical staff 24 h a day, 7 days a week.
- Staff who care for small and sick newborns receive orientation or refresher sessions in clinical handover policy and communication at least once every 12 months.

Process or output

- Proportion of carers in the health facility who report having received information about the care plan for their newborn.
- Proportion of health facility staff who care for small and sick newborns who have been trained in communication and counselling.

Outcome

- Proportion of carers in the health facility who express satisfaction with the information shared and the continuity of care received from different health care providers.

Quality statement 4.3: All carers are enabled to participate actively in the newborn's care through family-centred care and kangaroo mother care, in decision-making, in exercising the right to informed consent and in making choices.

Rationale: Evidence indicates that family and cultural considerations, including family- and patient-centred care, culturally effective care, family education and provision of care close to the family's home are important in the care of small and sick newborns. In a randomized controlled trial of 366 infants born before 37 weeks of gestation in two level-2 neonatal units in Sweden, a model of family care in which parents could stay 24 h/day, from admission to discharge, was compared with standard care. The model of family care reduced the total length of hospital stay by 5.3 days, the difference being due mainly to the period of intensive care. No statistically significant difference in infant morbidity was seen, except for a reduced risk of moderate-to-severe bronchopulmonary dysplasia in the group given family care.

In a recent, large, multicentre, multinational cluster-randomized controlled trial, family-integrated care was compared with standard care in a neonatal intensive care unit. Eligible infants were born at 33 weeks gestation or earlier and had no or low-level respiratory support. Newborns who received family-integrated care had higher overall weight gain at 21 days; in addition, there was a higher frequency of exclusive breastfeeding at hospital discharge and lower parental stress and anxiety scores at 21 days.

The WHO/UNICEF Baby-friendly Hospital Initiative, a long-standing global effort to protect, promote and support breastfeeding, is consistent with family-centred care. Ensuring that the families of small and sick newborns in hospital have a positive experience of care is essential for high-quality care.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols, standard operating procedures and job aids for providing information to carers about the purpose, importance, benefits, risks and possible costs of proposed investigations, referrals or treatments and participation in the care of their newborn.
- The health facility has an up-to-date newborn charter that states the policies for family-centred care and kangaroo mother care, guidance on confidentiality and the practice and culture of family presence during clinical examinations, procedures and treatment of newborns.
- The health facility has appropriate forms for parents or carers to sign in order to give their consent to procedures, investigations and treatment. When consent is given orally, this is registered on the patient's chart.

- Staff who care for newborns receive orientation or training in family-centred care, kangaroo mother care and legal and medical ethical principles of autonomy, informed consent, confidentiality and privacy at least once every 12 months.

Process or output

- Proportion of carers who were informed about their right to express their views and participate in making decisions about their newborns' care.
- Proportion of carers in the health facility who were offered the option and were present with their newborn during medical procedures.

Outcome

- Proportion of carers who considered that their views had been taken into consideration or sought in making decisions about their newborns' care.
- Proportion of parents or caregivers who gave their documented informed consent for procedures and treatment of their newborn.

References for quality statements 4.1, 4.2 and 4.3

- Martinez AM, Khu DTK, Boo NY, Neou L, Saysanasongkham B, Partridge JC. Barriers to neonatal care in developing countries: parents' and providers' perceptions. *J Paediatrics Child Health*. 2012;48:852–8.
- American Academy of Pediatrics Committee on Fetus and Newborn. Policy statement. Levels of neonatal care. *Pediatrics*. 2012;114(5):1341.
- National Health Service, Department of Health. Toolkit for high quality neonatal services. London: Department of Health; 2009.
- Chalmers B. Family-centred perinatal care: improving pregnancy, birth and postpartum care. Cambridge: Cambridge University Press; 2017.
- Bliss baby charter. London: Bliss; 2015 (<https://www.bliss.org.uk/health-professionals/bliss-baby-charter>, accessed 28 July 2020).
- A framework for neonatal transitional care. London: British Association of Perinatal Medicine; 2017.
- Örténstrand A, Westrup B, Broström EB, Sarman I, Åkerström S, Brune T, et al. The Stockholm neonatal family centered care study: effects on length of stay and infant morbidity. *Pediatrics*. 2010;125(2):e278–85.
- O'Brien K, Robson K, Bracht M, Cruz M, Lui K, Alvaro R, et al. Effectiveness of family integrated care in neonatal intensive care units on infant and parent outcomes: a multicentre, multinational, cluster-randomised controlled trial. *Lancet Child and Adolescent Health*. 2018;2(4):245–254.
- Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services. Geneva: World Health Organization; 2017.

Quality statement 4.4 NEW: Carers of small and sick newborns and staff understand the importance of nurturing interaction with the newborn, recognize and respect newborn behaviour and cues and include them in care decisions.

Rationale: Research on child development has shown that newborns are separate individuals with an identity, feelings and emotions, who can actively communicate, participate and respond, rather than being passive recipients. The fetus begins to experience the world through touch and then, later in pregnancy, through taste, sound, smell and sight. After birth, these senses enable developing babies to learn from their surroundings and to adapt, physiologically and psychologically. From birth, babies can recognize their mothers' voice, and soon after birth they respond to faces, gentle touch and holding, as well as the soothing sound of "baby talk". Carers can learn to understand how babies respond to them, which is essential for optimal development of the baby's rapidly growing brain. For small and sick newborns, parents, carers and health professionals may find it more difficult to respond to newborn behaviour and cues and require specific guidance.



QUALITY MEASURES

Input

- The health facility's newborn monitoring charts have a section for newborn behaviour and cues, which is completed as part of documentation of the newborn's general care.
- The health facility has a protocol for minimal handling and clustering care for small and sick newborns.
- Health facility clinical staff who care for small and sick newborns receive training and regular refresher sessions in newborn development, nurturing care, newborn cue-based interactions and mental health at least once.

Process or output

- Proportion of carers of small and sick newborns in the health facility who report having been educated in recognizing and responding to newborns' cues.
- Proportion of health facility staff who care for small and sick newborns who practise minimal handling and clustering of care, as tolerated by the infant.
- Proportion of newborns whose records contain completed documentation of behaviour and cues.

Outcome

- Proportion of carers of small and sick newborns in the health facility who report that they can recognize and respond to newborn's cues.
- Proportion of health facility staff who feel confident in supporting carers in effective interaction with their newborns.

References

- Brazelton TB, Nugent JK. The neonatal behavioral assessment scale. London: MacKeith Press; 2011.
- Nugent JK, Petrauskas B, Brazelton TB. The newborn as a person: enabling healthy infant development worldwide. Hoboken (NJ): John Wiley & Sons; 2009.
- Hepper P. Behaviour during the prenatal period: adaptive for development and survival. Child Dev Perspect. 2015;9(1):38–43.
- Lagercrantz H. Infant brain development: formation of the mind and the emergence of consciousness. Cham: Springer International Publishing; 2016.
- Murray L, Andrews E. The social baby. London: The Children's Project; 2002.
- Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential. Geneva: World Health Organization; 2018.
- World Health Organization, UNICEF. Care for child development: improving the care of young children. Geneva: World Health Organization; 2012.
- Symington AJ, Pinelli J. Developmental care for promoting development and preventing morbidity in preterm infants. Cochrane Database Syst Rev. 2006;(2):CD001814.
- Lucas JE, Richter LM, Daelmans B. Care for child development: an intervention in support of responsive caregiving and early child development. Child Care Health Dev. 2018;44(1):41–9.

Quality statement 4.5 NEW: All carers receive appropriate counselling and health education about the current illness and transition to kangaroo mother care follow-up, community care and continuous care, including early intervention and developmental follow-up.

Rationale: Carers of small and sick newborns require counselling and education about the newborn's current illness and discharge. A clear discharge plan that covers treatment, enhancing the newborn's feeding and development by attention to behavioural cues, when to seek care and follow-up arrangements will assist carers in the transition to community care and will reduce their stress. Families that have experienced the death of their newborn require follow-up information on the cause of death when it becomes available.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for transition to kangaroo mother care follow-up, community care and continuous care, including early intervention and developmental follow-up.

- The health facility clinical staff who care for newborns receive training and regular refresher sessions in newborn transition to kangaroo mother care follow-up, community care and continuous care, including early intervention and developmental follow-up at least once every 12 months.

Process or output

- Proportion of carers of newborns who have received appropriate counselling and health education about the current illness and transition to kangaroo mother care follow-up, community care and continuous care, including early intervention and developmental follow-up.

Outcome

- Proportion of carers of newborns who can report their newborns' current illness and problems requiring care.
- Proportion of carers of newborns discharged to community care who attended at least one follow-up appointment with their newborn.
- Proportion of low-birth-weight babies who attended follow-up and reached 2.5 kg.

References

- Neo-BFHI: the Baby-friendly Hospital Initiative for neonatal wards. Three guiding principles and ten steps to protect, promote and support breastfeeding. Core document with recommended standards and criteria. Morrisville (NC): International Lactation Consultant Association; 2015 (<http://www.ilca.org/main/learning/resources/neo-bfhi>, accessed 28 July 2020).
- Neo-BFHI: the Baby-friendly Hospital Initiative for neonatal wards. Educational material for decision-makers and staff. Morrisville (NC): International Lactation Consultant Association; 2015 (<http://www.ilca.org/main/learning/resources/neo-bfhi>, accessed 28 July 2020).
- Neonatal specialist care. Quality standard. London: National Institute for Health Care and Excellence; 2010.
- Purdy IB, Craig JW, Zeanah P. NICU discharge planning and beyond: recommendation for parent psychosocial support. *J Perinatol*. 2015;35:S24–8.
- Transitioning newborns from NICU to home: a resource toolkit. Bethesda (MD): Agency for Healthcare Research and Quality; 2013.
- Brett J, Staniszewska S, Newburn M, Jones N, Taylor L. A systematic mapping review of effective interventions for communicating with, supporting and providing information to parents of preterm infants. *BMJ Open*. 2011;1(1):e000023.
- Sacks E. Defining disrespect and abuse of newborns: a review of the evidence and an expanded typology of respectful maternity care. *Reprod Health*. 2017;14:66.

Quality statement 4.6 NEW: In humanitarian and fragile settings, including outbreak and pandemic situations, special consideration is given to the specific psychosocial and practical needs of small and sick newborns and their carers.

Rationale: Care-seeking for small and sick newborns during humanitarian crises and in fragile settings, including outbreak situations such as the global COVID-19 pandemic, is a challenge for both mobile and static populations, for many reasons. Effective communication is crucial to address fear and misinformation. Practical support is fundamental and necessary, and special consideration should be given to the specific psychosocial needs of small and sick newborns and their carers. Carers are at risk of poor mental health due to the situation, and newborns in these settings are also at risk of emotional and behavioural difficulties, acutely and in the longer term, particularly if they are separated from their mothers.



QUALITY MEASURES

Input

- The health facility setting has written, up-to-date guidelines, protocols and standard operating procedures for the care of small and sick newborns in humanitarian settings and outbreak situations that are consistent with WHO guidance during emergency (e.g. during the COVID 19 pandemic) and *Newborn health in humanitarian settings: field guide* and *Infant and young child feeding in emergencies. Operational guidance for emergency relief staff and programme managers*.
- The health facility setting has written, up-to-date guidelines, protocols and standard operating procedures for addressing the specific psychosocial and practical needs of small and sick newborns and their carers.
- The health facility setting provides care for small and sick newborns in humanitarian settings and pandemic situations without discrimination.
- The health facility clinical staff who care for newborns and their families in humanitarian settings and pandemic situations receive training and regular refresher sessions in the special needs of newborns and practical and psychosocial support at least once.
- The clinical staff at the health facility who care for newborns and their families in outbreaks and pandemic situations receive training and regular refresher sessions in the special needs of newborns and practical and psychosocial support at least once.

Process or output

- Proportion of carers of newborns in humanitarian and fragile settings, including outbreaks and pandemic situations, who report having received support from services.

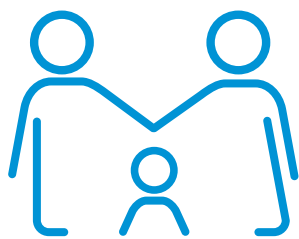
- Proportion of health facility clinical staff who have received training on the care of newborns and their families specific to humanitarian settings, including the special needs of newborns and practical and psychosocial support.
- Proportion of health facility clinical staff who have received training in the care of newborns and their families specific to outbreaks and pandemic situations, including the special needs of newborns, and practical and psychosocial support.

Outcome

- Proportion of carers in humanitarian and fragile settings, including outbreaks and pandemic situations, who report that their psychosocial and practical needs were met.

References

- Newborn health in humanitarian settings: field guide. New York City (NY): Interagency Working Group on Reproductive Health in Crises; 2017.
- Infant and young child feeding in emergencies. Operational guidance for emergency relief staff and programme managers. New York City (NY): Interagency Working Group on Reproductive Health in Crises; 2017.
- Save the Children, United Nations Children's Fund, World Health Organization, United Nations High Commissioner for Refugees. Roadmap to accelerate progress for every newborn in humanitarian settings 2020–2025. New York City (NY): Save the Children; 2019.
- Maintaining essential health services: operational guidance for the COVID-19 context, 1 June 2020. Geneva: World Health Organization; 2020 (<https://www.who.int/publications/i/item/10665-332240>, accessed 28 July 2020).
- International Federation of Red Cross and Red Crescent Societies, United Nations Children's Fund, World Health Organization. Community-based health care, including outreach and campaigns, in the context of the COVID-19 pandemic. Interim guidance May 2020. Geneva: World Health Organization; 2020.
- Clinical management of COVID-19. Interim guidance 27 May 2020. Geneva: World Health Organization; 2020.
- Q&A on COVID-19, pregnancy, childbirth and breastfeeding. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-on-covid-19-pregnancy-and-childbirth>, accessed 28 July 2020).
- Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Geneva: World Health Organization; 2020 ([https://www.who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125), accessed 28 July 2020).
- Coronavirus disease (COVID-19) outbreak: rights, roles and responsibilities of health workers, including key considerations for occupational safety and health. Geneva: World Health Organization; 2020 ([https://www.who.int/publications/i/item/coronavirus-disease-\(covid-19\)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health](https://www.who.int/publications/i/item/coronavirus-disease-(covid-19)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health), accessed 28 July 2020).



STANDARD 5

RESPECT, PROTECTION AND FULFILMENT OF NEWBORNS' RIGHTS AND PRESERVATION OF DIGNITY

Standard 5: Newborns' rights are respected, protected and fulfilled, without discrimination, with preservation of dignity at all times and in all settings during care, transport and follow-up.

Quality statement 5.1: All newborns have equitable access to health care services, with no discrimination of any kind.

Quality statement 5.2: The carers of all newborns are made aware of and given information about the newborn's rights to health and health care.

Rationale for quality statements 5.1 and 5.2: The Convention on the Rights of the Child ensures that the health of newborns is a human right and provides a holistic legal and normative framework for national laws, policies, strategies and programmes for reducing newborn mortality and improving services. The rights of newborns and infants have been promoted further. In 2001, the World Congress of Perinatal Medicine adopted the Declaration of Barcelona on the Rights of Mother and Newborn, led by the World Association of Perinatal Medicine; and, in 2011, the Parma Charter on the Rights of the Newborn provided a detailed list of rights related to the promotion and protection of newborn health. In 2016, the World Association for Infant

Mental Health published a position paper on the rights of infants (from birth to three years), listing both basic infant rights and social and health policy that should be based on the basic principles. The Respectful Maternity Care Charter in 2019 specifies the rights of both mothers and newborns. These documents recognize the newborn not as a mere recipient of care but as a human being with fundamental rights, as stipulated in international human rights law, which include the rights to life, survival, health and development, the right to a legal identity from birth, the right to be protected from harm, violence and neglect and the right to a caring, loving, nurturing environment. Babies are often not seen as individuals with the right to access care. All discrimination against newborns should be prevented, including bias according to gender, minority group, disability or HIV infection.



QUALITY MEASURES FOR QUALITY STATEMENT 5.1

Input

- The health facility has adopted and implements a policy to guarantee free or affordable health care for all newborns, in accordance with and as defined by national legislation or regulations.
- The health facility has adopted and implements a policy to guarantee no discrimination of any kind against newborns or their carers in the provision of care, including for poor, vulnerable and disabled babies.
- The health facility staff receive training and periodic refresher courses on non-discriminatory practices, promoting equity and cultural competence.

Process or output

- Proportion of the health facility staff who have received training and refresher courses on non-discriminatory practices, promoting equity and cultural competence.

Outcome

- Proportion of carers of newborns who report any form of discrimination or refusal of care due to their economic, social, religious, gender, linguistic or other status.
- Proportion of carers of newborns in a minority, migrant or other vulnerable group who were satisfied with the services provided.
- Proportion of carers of newborns who receive care in the health facility whose financial access is assisted or covered by health insurance.



QUALITY MEASURES FOR QUALITY STATEMENT 5.2

Input

- The health facility has an up-to-date charter of newborn rights, in line with the United Nations Convention on the Rights of the Child and, when relevant, national child and other human rights laws.
- The health facility visibly displays and makes available information about the charter in leaflets and posters in all areas in which newborns are cared for (neonatal unit, wards and waiting rooms).
- The health facility promotes awareness-raising events about newborn's rights, such as celebrating World Prematurity Day and the International Day of the Child, and promoting the Respectful Maternity Care Charter.
- The principles and standards in the health facility's charter on newborn rights are integrated into the system for improving the quality of care in the health facility.
- The health facility has a team or focal person responsible for overseeing observance of the charter on newborn rights in the health facility.

Process or output

- Proportion of staff in the health facility who care for newborns who understand the charter on newborn rights and its application in practice.
- Proportion of carers who are told about the charter on newborn rights as it pertains to the right to care at admission in an appropriate local language.

Outcome

- Proportion of parents or carers who consider that they were adequately informed about their newborn's rights, including their right to health and health care.



REFERENCES FOR QUALITY STATEMENTS 5.1 AND 5.2

- Declaration of Barcelona on the Rights of Mother and Newborn. In: Carrera JM, Cabero L, de Gruyter W, editors. Proceedings of the 5th World Congress of Perinatal Medicine; 2001 (<https://escrh.eu/wp-content/uploads/2018/02/declarationofbarcelonaontherightsofmotherandnewborn-1.pdf>, accessed 28 July 2020).
- Bevilacqua G, Corradi M, Donzelli GP, Fanos V, Gianotti D, Magnani C, et al. The Parma Charter of the Rights of the Newborn. J Matern Fetal Neonatal Med. 2011;24(1):171.
- Partnership for Maternal Newborn and Child Health, United Nations Population Fund, World Health Organization. Abu Dhabi Declaration: for every woman every child everywhere. New York City (NY): United Nations; 2015.
- Bevilacqua G, Corradi M, Donzelli GP, Fanos V, Gianotti D, Orzalesi M, et al. The Parma Charter of the Rights of the Newborn. J Matern Fetal Neonatal Med. 2010;24(1):171.

- WAIMH position paper on the rights of infants. Tampere: World Association for Infant Mental Health; 2016.
- Neo-BFHI: The Baby-friendly Hospital Initiative for Neonatal Wards. Three Guiding Principles and Ten Steps to protect, promote and support breastfeeding. Core document with recommended standards and criteria (Based on BFHI Revised, Updated and Expanded for Integrated Care, Section 1).
- Neo-BFHI: The Baby-friendly Hospital Initiative for Neonatal Wards. Educational material for decision-makers and staff.
- Sacks E, Kinney MV. Respectful maternal and newborn care: building a common agenda. *Reprod Health*. 2015;12:46.
- Sacks E. Defining disrespect and abuse of newborns: a review of the evidence and an expanded typology of respectful maternity care. *Reprod Health*. 2017;14:66.
- Respectful maternity care charter. Universal rights of mothers and newborns. Washington DC: Global Respectful Maternity Care Council; 2019 (<https://www.whiteribbonalliance.org/respectful-maternity-care-charter/>, accessed 28 July 2020).

Quality statement 5.3: All newborns and their carers are treated with respect and dignity, and their right to privacy and confidentiality is respected.

Quality statement 5.4: All newborns are protected from any physical or mental violence, injury, abuse, neglect or any other form of maltreatment.

Rationale for quality statements 5.3 and 5.4: Few studies are available on disrespect and abuse of newborns, but recurring themes have included failure to meet professional standards of care, unnecessary separation of caregiver and newborn, lack of consent for treatment, lack of treatment, including no effort to resuscitate and insufficient providers, lack of equipment, unsanitary conditions and early discharge. Stigmatization and discrimination have been reported against small, sick, preterm and female newborns, and denial of care has been threatened for babies born at home. Lack of consent for care was also reported, with unauthorized care and referrals and detainment for non-payment of health facility bills.

Newborns cannot express their needs or experiences verbally and therefore need advocates, such as parents or carers, to provide consent for medical procedures. Direct abuse is reprehensible, and there is also evidence that newborns experience disrespectful care such as neglect, being left unattended and not receiving gentle, compassionate or holistic care. Mechanisms should be in place to ensure respectful, safe, gentle handling of newborns in a warm, dry environment with appropriate clothing and prompt removal of soiled diapers and cleaning up of urine and faeces. There is often limited attention to pain relief, exposure to noise and light or keeping the baby warm and covered during procedures. Stillborn infants should also be handled respectfully and their carers allowed to grieve in a culturally appropriate manner.



QUALITY MEASURES FOR QUALITY STATEMENT 5.3

Input

- The health facility has written, up-to-date guidelines, protocols, standard operating procedures and mechanisms to ensure written and verbal confidentiality.
- The health facility has written, up-to-date guidelines, protocols and standard operating procedures to ensure respect for neonatal deaths and stillborn infants and their families.
- The health facility has facilities in which newborns can be examined with both visual and auditory privacy when required.
- Health facility staff are trained in providing care with respect for dignity and for maintaining confidentiality during the care of newborns and have received refresher training at least once.
- Health care staff in the health facility who care for small and sick newborns receive in-service training and regular refresher sessions in respectful handling and care of liveborn and stillborn infants and neonatal deaths, at least once.

Process or output

- Proportion of health care providers in the health facility who have attended training or received orientation in respecting and protecting the dignity of newborns and their carers.

Outcome

- Proportion of carers of small and sick newborns in the health facility who perceived that they and their newborns were treated with compassion and respect and their dignity was preserved.
- Proportion of carers of dead and stillborn newborns who report they and their newborns were treated with respect and dignity and their choices to grieve or memorialize the infant respected.



QUALITY MEASURES FOR QUALITY STATEMENT 5.4

Input

- The health facility has clear mechanisms, procedures and up-to-date national protocols that comply and are consistent with the Convention on the Rights of the Child and domestic child protection laws.
- The health facility has written, up-to-date policies, guidelines and mechanisms to ensure respectful, safe, gentle handling of newborns in a warm, dry environment with appropriate clothing, prompt removal of soiled diapers and observation of appropriate hygienic practices.

- The health facility has a written accountability mechanism in the event of maltreatment of small and sick newborns.
- The health facility staff receive training and orientation in identifying, assessing and providing care and support for victims of any form of maltreatment and on child protection procedures.

Process or output

- Number of cases of suspected newborn maltreatment identified in the health facility in the previous 12 months.
- Proportion of staff who care for newborns at the health facility who are trained in protection, care and support in cases of neonatal maltreatment.

Outcome

- Proportion of carers of small and sick newborns who reported physical or verbal abuse to their newborn in the health facility.



REFERENCES FOR QUALITY STATEMENTS 5.3 AND 5.4

- The prevention and elimination of disrespect and abuse during facility-based childbirth. Geneva: World Health Organization; 2014.
- Respectful maternity care charter. Universal rights of mothers and newborns. Washington DC: Global Respectful Maternity Care Council; 2019 (<https://www.whiteribbonalliance.org/respectful-maternity-care-charter/>, accessed 28 July 2020).
- Respectful maternity care charter 2011: the universal rights of childbearing women. Washington DC: Global Respectful Maternity Care Council; 2011.
- Windau-Melmer T. A guide for advocating for respectful maternity care. Washington DC: Futures Group; 2013.
- Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services; the revised baby-friendly hospital initiative: implementation guidelines. Geneva: World Health Organization; 2018.
- Bohren MA, Vogel JP, Hunter EC, Lutsiv O, Makh SK, Souza JP, et al. The mistreatment of women during childbirth in health facilities globally: a mixed-methods systematic review. PLoS Med. 2015;12(6):e1001847.
- Sacks M, Kinney MV. Respectful maternal and newborn care: building a common agenda. Reprod Health. 2015;12:46.
- Sacks E. Defining disrespect and abuse of newborns: a review of the evidence and an expanded typology of respectful maternity care. Reprod Health. 2017;14:66.
- National Health Service, Department of Health. Toolkit for high quality neonatal services. London: Department of Health; 2009.

Quality statement 5.5 NEW: All newborns have their birth registered and have an identity.

Rationale: Article 7(1) of the Convention on the Rights of the Child states: “The child shall be registered immediately after birth and shall have the right from birth to a name, the right to acquire a nationality”. Although the right to a name and a nationality is well established, many births remain unregistered. Carers of newborns may not understand or recognize the benefits of birth registration for themselves or their newborn, such as accessing health and education or acquiring identification documents. Identification of each newborn by name and age on a label attached to the baby while in the health facility provides security. Birth registration has future legal and practical applications, including universal health coverage, education and social protection. Carers may be concerned about the cost or that registration may identify them negatively, individually, culturally or ethnically, and they may require support to ensure registration of birth of their newborn.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for birth registration according to international guidelines.
- The health facility provides practical support to carers of newborns to register the newborn's birth in the national vital registration system within the prescribed time.
- The health facility ensures that newborns have a unique identification with complete birth details.
- Staff in the health facility who care for newborns receive in-service training and regular refresher sessions in birth registration and identification at least once.

Process or output

- Proportion of carers of newborns who received information on the importance of birth registration, obtaining a birth certificate and registration in the civil registrar to obtain a birth certificate.
- Proportion of newborns in the health facility who have a unique identification.

Outcome

- Proportion of all births in the health facility that were appropriately registered in the national vital registration system.

References

- Every child's birth right: inequities and trends in birth registration. New York City (NY): United Nations Children's Fund; 2013.
- Respectful maternity care charter. Universal rights of mothers and newborns. Washington DC: Global Respectful Maternity Care Council; 2019 (<https://www.whiteribbonalliance.org/respectful-maternity-care-charter/>, accessed 28 July 2020).

Quality statement 5.6 NEW: All newborns who die and all stillbirths have their deaths registered.

Rationale: Globally, death certificates are not issued for most neonatal deaths and almost all stillbirths, and there is limited information on the causes and contextual factors that contributed to the deaths. Carers should be encouraged to register the deaths of newborns and stillbirths, as it will assist them in grieving. Counting the numbers of stillbirths and neonatal deaths, gathering information on where and why the deaths occurred and contributing causes and avoidable factors will help health facility staff, programme managers, administrators and policy-makers to prevent future deaths and improve the quality of care provided throughout the health system.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures for registering neonatal death and stillbirths.
- The health facility provides practical and financial support to carers of newborns to register the newborn's death, including stillbirths, in the national vital registration system.
- Health care staff in the health facility who care for small and sick newborns receive in-service training and regular refresher sessions in death registration at least once every 12 months.

Process or output

- Proportion of carers of newborns who died and of stillborns who received information on the importance of death registration, obtaining a death certificate and registration with the civil registrar to obtain a death certificate

Outcome

- Proportion of all deaths occurring in the health facility that were appropriately registered in the national vital registration system.
- Proportion of stillbirths in the health facility for whom the death was registered.

References

- Making every baby count: audit and review of stillbirths and neonatal deaths. Geneva: World Health Organization; 2016.
- Respectful maternity care charter. Universal rights of mothers and newborns. Washington DC: Global Respectful Maternity Care Council; 2019 (<https://www.whiteribbonalliance.org/respectful-maternity-care-charter/>, accessed 28 July 2020).



STANDARD 6

EMOTIONAL, PSYCHOSOCIAL AND DEVELOPMENTAL SUPPORT

Standard 6: All small and sick newborns are given developmentally supportive care and follow-up, and their families receive emotional and psychosocial support that is sensitive to their needs and strengthens their capability.

Quality statement 6.1: All small and sick newborns stay with their carers, with minimal separation, and the role of carers is recognized and supported at all times during care, including rooming-in during hospitalization.

Quality statement 6.2 NEW: All newborns born preterm or with a low birth weight receive kangaroo mother care as soon as possible after birth, and the parents are supported in its provision.

Rationale for quality statements 6.1 and 6.2: Mothers and newborns should not be separated, as the benefits of non-separation include reduced infection, better bonding, promotion of breastfeeding and safety. Rooming-in promotes breastfeeding of preterm infants and attachment and empowerment of parents. Preterm infants, who are commonly separated from their mothers for a long time, are exclusively breastfed at later postnatal and postmenstrual ages. Neonatal wards with integrated maternity care, to which mothers are admitted with their babies from birth, facilitate earlier establishment of exclusive breastfeeding. Rebuilding of neonatal intensive care

units with single-family rooms has improved breastfeeding rates at discharge and three months after discharge. kangaroo mother care should be supported throughout the care pathway because of its multiple benefits.

Several randomized controlled trials of different family-centred intervention packages or models for neonatal care in various settings have demonstrated benefits for infants, such as weight gain and neurodevelopmental progress, and also decreased parental stress and anxiety and increased caregiving efficacy. Carers require support in providing family-centred care. Small and sick newborns require nurturing care with emotional support and stimulation, and carers require support to provide appropriate nurturing care and responsive parenting.



QUALITY MEASURES FOR QUALITY STATEMENTS 6.1 AND 6.2

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures to minimize separation of newborns from their mothers and carers and to ensure 24-h access for carers, without interruption during rounds, shift changes and care procedures.
- The health facility has written, up-to-date guidelines, protocols or standard operating procedures for delivering family-centred care and kangaroo mother care.
- The health facility has a rooming-in policy to allow carers to stay with their newborns and provides accommodation close to the newborn.
- The health facility clinical staff who care for small and sick newborns receive training and regular refresher sessions in delivering family-centred care and kangaroo mother care at least once.

Process or output

- Proportion of parents and/or carers who were given the opportunity to room in with their newborn.
- Proportion of carers who experienced unnecessary interruption to access to their newborn in the previous 24 h.
- Proportion of carers of newborns who were given information about family-centred care and kangaroo mother care.

Outcome

- Proportion of newborns in the health facility whose carers were present during medical procedures performed on their newborn.
- Proportion of newborns admitted to the health facility whose carers were allowed to room-in with their newborn.
- Proportion of newborns born preterm or with a low birth weight who received kangaroo mother care.

References for quality statements 6.1 and 6.2

- Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential. Geneva: World Health Organization; 2018.
- Neo-BFHI: the Baby-friendly Hospital Initiative for neonatal wards. Three guiding principles and ten steps to protect, promote and support breastfeeding. Core document with recommended standards and criteria. Morrisville (NC): International Lactation Consultant Association; 2015 (<http://www.ilca.org/main/learning/resources/neo-bfhi>, accessed 28 July 2020).
- Neo-BFHI: the Baby-friendly Hospital Initiative for neonatal wards. Educational material for decision-makers and staff. Morrisville (NC): International Lactation Consultant Association; 2015 (<http://www.ilca.org/main/learning/resources/neo-bfhi>, accessed 28 July 2020).
- Chalmers B. Family-centred perinatal care: improving pregnancy, birth and postpartum care. Cambridge: Cambridge University Press; 2017.
- Örténstrand A, Westrup B, Broström EB, Sarman I, Åkerström S, Brune T, et al. The Stockholm neonatal family centered care study: effects on length of stay and infant morbidity. *Pediatrics*. 2010;125(2):e278–85.
- O'Brien K, Robson K, Bracht M, Cruz M, Lui K, Alvaro R, et al. Effectiveness of family integrated care in neonatal intensive care units on infant and parent outcomes: a multicentre, multinational, cluster-randomised controlled trial. *Lancet Child and Adolescent Health*. 2018;2(4):245–254.
- Bliss baby charter. London: Bliss; 2015 (<https://www.bliss.org.uk/health-professionals/bliss-baby-charter>, accessed 28 July 2020).
- A framework for neonatal transitional care. London: British Association of Perinatal Medicine; 2017
- National Health Service, Department of Health. Toolkit for high quality neonatal services. London: Department of Health; 2009.
- Zaka N, Alexander EC, Manikam L, Norman ICF, Akhbari M, Moxon S, et al. Quality improvement initiatives for hospitalised small and sick newborns in low- and middle-income countries: a systematic review. *Implement Sci*. 2018;13(1):20.
- World Health Organization, UNICEF. Care for child development: improving the care of young children. Geneva: World Health Organization; 2012.

Quality statement 6.3 NEW: All small and sick newborns receive appropriate developmental supportive care, and their families are recognized as partners in care.

Rationale: Emotional, psychosocial and developmental support are essential components of the care of small and sick newborns. Newborns were formerly considered to be unaware of their environment and unable to participate in meaningful interaction. This belief has been disproved. Emotional, psychosocial and developmental support provide an environment for the survival and thriving of the newborn.

“Nurturing care” comprises the conditions necessary for babies’ and children’s health, nutrition, security and safety and responsive caregiving and opportunities for early learning. Nurturing care starts before birth, keeps the newborn safe, healthy and well nourished and ensures that their needs are met and they can interact with their caregivers and others. Small and sick newborns are a vulnerable group who benefit more from nurturing care and are at risk of developmental difficulties without it. Carers need guidance in their interactions with their small or sick newborns, because the behaviour and responses of these babies are often less predictable than those of others. Health professionals should create a supportive environment and provide carers with information and advice on caring for their small and sick newborn.

During the third trimester of gestation, the fetal neurological system is in highly active development. It is during this time that the preterm infant is in a neonatal unit, an environment that is very different from that of the protective womb, where exposure to bright lights, high sound levels and noxious interventions will influence the newborn’s neurosensory development and may create adverse effects on the immature brain. Sensory experiences lead to behavioural responses in the newborn and can influence the expression of genes, which can create blueprints for future adaptation to the environment.

“Developmental supportive care”, introduced in the mid-1980s, consists of a broad category of interventions designed to minimize the stress of the neonatal intensive care environment. Various strategies have been used to modify the environment to decrease stress on the newborn, including controlling external stimuli (vestibular, auditory, visual, tactile), clustering nursery care activities, minimal handling, intentional positioning (nesting, prone position, swaddling) and protecting sleep. Programmes such as the Newborn Individualized Developmental Care and Assessment Program combine these strategies according to need. Several models of developmental supportive care have been proposed, with the newborn at the centre of a healing environment surrounded by elements of protecting skin, optimizing nutrition, partnering with families, position and handling, guarding sleep and minimizing stress and pain. Skin-to-skin contact with the mother or father and kangaroo mother care are the basis of these models, with strong evidence of benefits for the newborn. Many studies of programmes with one or more developmental care elements have shown positive outcomes on health and neurodevelopment. Nevertheless, systematic reviews in 2006, 2013 and 2018 did not provide strong support for developmental care programmes, often because of limitations of the studies.

Nurses in neonatal intensive care units in high-income countries generally practise minimal handling and grouping of interventions when possible (clustering care), as tolerated by the infant. Care should maximize contact with the parents, especially mothers, to encourage bonding and to support lactation and breastfeeding. It should also include correct positioning of the newborn to protect the skin, safeguard sleep and minimize stress and pain.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols, standard operating procedures and mechanisms to ensure that staff and carers provide developmental supportive care for small and sick newborns.

- The health facility has a mechanism for regular collection of information on carer and provider experiences of developmental supportive care.
- The health facility staff who care for small and sick newborns receive training and regular refresher sessions in developmental supportive care for newborns at least once.

Process or output

- Proportion of small and sick newborns in the health facility for whom there is information on the developmental supportive care received as part of documentation of their general care.
- Proportion of small and sick newborns in the health facility whose carers reported participating in their newborn's care.
- Proportion of small and sick newborns who received appropriate developmental supportive care during their stay in the health facility.

Outcome

- Proportion of small and sick newborns who demonstrate the appropriate developmental state while in hospital before discharge.

References

- National Health Service, Department of Health. Toolkit for high quality neonatal services. London: Department of Health; 2009.
- Britto PR, Lye SJ, Proulx K, Yousafzai AK, Matthews SG, Vaivada T, et al. Nurturing care: promoting early childhood development. *Lancet*. 2017;389:91–102.
- Black MM, Walker SP, Fernald LCH, Andersen CT, DiGirolamo AM, Lu C, et al. Early childhood development coming of age: science through the life course. *Lancet*. 2017;389:77–90.
- Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential. Geneva: World Health Organization; 2018.
- Shonkoff JP, Garner AS, the Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, Section on Developmental and Behavioral Pediatrics. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*. 2012;129(1):e232–46.
- Taylor HG. Academic performance and learning disabilities. In: Nosarti C, Murray RM, Hack M, editors. *Neurodevelopmental outcomes of preterm birth: from childhood to adult life*. New York City (NY): Cambridge University Press; 2010:209–23.
- Murray L, Andrews E. *The social baby*. London: The Children's Project; 2002.
- Grunewaldt KH, Fjortoft T, Bjuland KJ, Brubakk AM, Eikenes L, Håberg AK, et al. Follow-up at age 10 years in ELBW children – functional outcome, brain morphology and results from motor assessments in infancy. *Early Hum Dev*. 2014;90:571–8.
- Vohr B. Speech and language outcomes of very preterm infants. *Semin Fetal Neonatal Med*. 2014;19:78–83.
- Als H, Duffy FH, McAnulty GB, Rivkin MJ, Vajapeyam S, Mulkern RV, et al. Early experience alters brain function and structure. *Pediatrics*. 2004;113(4):846–57.

- Lagercrantz H. Infant brain development: formation of the mind and the emergence of consciousness. Cham: Springer International Publishing; 2016.
- Hepper P. Behavior during the prenatal period: adaptive for development and survival. *Child Dev Perspect*. 2015;9(1):38–43.
- van IJendoorn MH, Bakermans, Kranenburg MJ, Ebstein RP. Methylation matters in child development: toward developmental behavioral epigenetics. *Child Dev Perspect*. 2011;5(4):305–10.
- Provenzi L, Guida E, Montirosso R. Preterm behavioral epigenetics: a systematic review. *Neurosci Biobehav Rev*. 2018;84:262–71.
- Als H, Lawhon G, Brown E, Gibes R, Duffy FH, McAnulty G, et al. Individualized behavioural and environmental care for the very low birth weight preterm infant at high risk for bronchopulmonary dysplasia: neonatal intensive care unit and developmental outcome. *Pediatrics*. 1986;78:1123–32.
- Als H, Lawhon G, Duffy F, McAnulty GB, Gibes-Grossman R, Blickman JG. Individualized developmental care for the very low-birth-weight preterm infant: medical and neurofunctional effects. *JAMA*. 1994;272:853–8.
- Als H, Duffy FH, McAnulty GB. Effectiveness of individualized neurodevelopmental care in the newborn intensive care unit (NICU). *Acta paediatrica*. 1996;85(Suppl 416):21–30.
- Coughlin M, Gibbins S, Hoath S. Core measures for developmentally supportive care in neonatal intensive care units: theory, precedence and practice. *J Adv Nurs*. 2009;65(10):2239–48.
- Altimier L, Phillips R. The neonatal integrative developmental care model: advanced clinical applications of the seven core measures for neuroprotective family-centered developmental care. *Newborn Infant Nurs Rev*. 2016;16:230–44.
- Altimier L. Mother and child integrative developmental care model: a simple approach to a complex population. *Newborn Infant Nurs Rev*. 2011;11:105–8.
- Altimier L, Phillips R. The neonatal integrative developmental care model: seven neuroprotective core measures for family centered care. *Newborn Infant Nurs Rev*. 2013;13:9–22.
- Altimier L. Neuroprotective core measure 1: the healing environment. *Newborn Infant Nurs Rev*. 2015;15:89–94.
- Liaw JJ, Yang L, Chang LH, Chou HL, Chao SC. Improving neonatal caregiving through a developmentally supportive care training program. *Appl Nurs Res*. 2009;22(2):86–93.
- Altimier LB, Eichel M, Warner B, Tedeschi L, Brown B. The neonatal integrative developmental care model: seven neuroprotective core measures for family-centered developmental care. *Neonatal Intensive Care*. 2005;18(Suppl 4):12–6.
- Conde-Agudelo A, Diaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. *Cochrane Database Syst Rev*. 2014;(4):CD002771.
- Hendricks-Muñoz KD, Prendergast CC, Caprio MC, Wasserman RS. The effectiveness of developmentally supportive positioning on preterm infants' pain response at neonatal intensive care units. *Newborn Infant Nurs Rev*. 2002;2(1):39–45.
- Ludwig S, Steichen J, Khoury J, Krieg P. Quality improvement analysis of developmental care in infants less than 1500 grams at birth. *Newborn Infant Nurs Rev*. 2008;8(2):94–100.

- Belfort MB, Anderson PJ, Nowak VA, Lee KJ, Molesworth C, Thompson DK, et al. Breast milk feeding, brain development, and neurocognitive outcomes: a 7-year longitudinal study in infants born at less than 30 weeks' gestation. *J Pediatr*. 2016;177:133–9.
- Manzoni P, Stolfi I, Pedicino R, Vagnarelli F, Mosca F, Pugni L, et al. Human milk feeding prevents retinopathy of prematurity (ROP) in preterm VLBW neonates. *Early Hum Dev*. 2013;89(Suppl 1):S64–8.
- Graven SN, Browne JV. Sleep and brain development: the critical role of sleep in fetal and early neonatal brain development: a systematic review. *Joanna Briggs Inst Libr Syst Rev*. 2009;7:22.
- Bergman N. The neuroscience of birth – and the case for zero separation. *Curationis*. 2014;37:1.
- Gudsnuik K, Champagne F. Epigenetic effects of early developmental experiences. *Clin Perinatol*. 2011;38:703.
- Benoit B, Campbell-Yeo M, Johnston C, Latimer M, Caddell K, Orr T. Staff nurse utilization of Kangaroo Care as an intervention for procedural pain in preterm infants. *Adv Neonatal Care*. 2016;16:229–32.
- Picheansathian W, Woragidpoonpol P, Baosoung C. Positioning of preterm infants for optimal physiological development: a systematic review. *Joanna Briggs Inst Libr Syst Rev*. 2009;7(7):224–59.
- Hunter J. Therapeutic positioning: neuromotor, physiologic and sleep implications. In: *Developmental care of newborns and infants*. Glenview (IL): National Association of Neonatal Nurses; 2010:285–312.
- Hoath S. The skin as a neurodevelopmental interface. *NeoReviews*. 2001;2:e292.
- Shah PS, Herbozo C, Aliwalas LL, Shah VS. Breastfeeding or breast milk for procedural pain in neonates. *Cochrane Database Syst Rev*. 2012;12:CD004950.
- Johnston C, Campbell-Yeo M, Disher T, Benoit B, Fernandes A, Streiner D, et al. Skin-to-skin care for procedural pain in neonates. *Cochrane Database Syst Rev*. 2017;2:CD008435.
- Provenzi L, Broso S, Montirosso R. Do mothers sound good? A systematic review of the effects of maternal voice exposure on preterm infants' development. *Neurosci Biobehav Rev*. 2018;88:42–50.
- Symington A, Pinelli J. Distilling the evidence on developmental care: a systematic review. *Adv Neonatal Care*. 2002;2:198–221.
- Jacobs S, Sokol J, Ohlsson A. The newborn individualized developmental care and assessment program is not supported by meta-analyses of the data. *J Pediatr*. 2002;140:699–706.
- Symington AJ, Pinelli J. Developmental care for promoting development and preventing morbidity in preterm infants. *Cochrane Database Syst Rev*. 2006;(2):CD001814.
- Ohlsson A, Jacobs SE. NIDCAP: a systematic review and meta-analyses of randomized controlled trials. *Pediatrics*. 2013;131(3):e881–93.
- Burke S. Systematic review of developmental care interventions in the neonatal intensive care unit since 2006. *J Child Health Care*. 2018;22(2):269–86.

Quality statement 6.4 NEW: All families receive care in an environment in which their socioeconomic, emotional and cultural needs are respected and supported.

Rationale: Emotional support for carers of small and sick newborns is particularly important because of the combination of a highly stressful medical environment and their need to assume responsibility for their newborn in the future. Family-centred care delivered appropriately can bridge this gap, with graduated parental responsibility, initially under supervision, and developing partnerships with carers and empowering them to become more independent. Carer support should be structured to provide practical, psychological and emotional support and carer involvement in planning and providing care for their newborn during admission to the health facility and in planning discharge.



QUALITY MEASURES

Input

- The health facility has a patient's charter that documents the facility's responsibilities towards families and includes partnerships with carers.
- The health facility has a structured approach to supporting carers of newborns that includes practical, psychological and emotional support.
- The health facility has mechanisms to support the health care needs of carers, including visits for mental health and postpartum care for mothers.
- The health facility has financial support mechanisms to provide additional care and meet the practical needs of carers during their newborns' stay in the health facility.

Process or output

- Proportion of carers of small and sick newborns in the health facility who are involved in planning care for their newborn during admission to the health facility.

Outcome

- Proportion of carers of small and sick newborns who report that their socioeconomic, emotional, cultural and mental health needs are respected and supported.

References

- O'Brien K, Robson K, Bracht M, Cruz M, Lui K, Alvaro R, et al. Effectiveness of family integrated care in neonatal intensive care units on infant and parent outcomes: a multicentre, multinational, cluster-randomised controlled trial. *Lancet Child and Adolescent Health*. 2018;2(4):245-254.

- Guidelines on optimal feeding of low birth-weight infants in low-and middle-income countries. Geneva: World Health Organization; 2011.
- Implementation guidance: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services; the revised baby-friendly hospital initiative. Geneva: World Health Organization; 2018.
- Developmental follow-up of children and young people born preterm. Clinical guideline. London: National Institute for Health Care and Excellence; 2017.
- Developmental follow-up of children and young people born preterm. Quality standard. London: National Institute for Health Care and Excellence; 2018.

Quality statement 6.5 NEW: All small and sick newborns receive appropriate, coordinated developmental follow-up with minimal disruption to family life and routines.

Rationale: Developmental follow-up in high-income settings, with coordinated multidisciplinary teams consisting of allied health workers who provide physiotherapy, speech and occupational therapy and screening for vision and hearing abnormalities, improve the outcomes of small or sick newborns. Newborns who are born preterm, with congenital abnormalities or with a history of neonatal infection or neonatal encephalopathy may have significant disability. Retinopathy of prematurity is a risk associated with administration of high concentrations of supplemental oxygen to preterm newborns, and developmental review, with assessments of vision and hearing and monitoring of general health, growth and anaemia after discharge at follow-up visits is beneficial.

Emotional distress in a newborn care unit may disrupt infant–parent bonding and diminish parents’ self-confidence in caring for their child. Parents or carers of small and sick newborns require mental health screening before discharge to identify those at high risk of emotional and psychological difficulties and to link them to appropriate services. Mothers are at risk of anxiety and depression, which can have long-term negative consequences on the infant and child’s behavioural and cognitive development.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols and standard operating procedures to provide appropriate, coordinated multidisciplinary developmental follow-up.
- The health facility has a model of care for developmental follow-up that includes a coordinated multidisciplinary team with participation of carers.
- The health facility has staff with appropriate competence to deliver coordinated multidisciplinary developmental follow-up.

- The health facility has adequate space, supplies and equipment to deliver coordinated multidisciplinary developmental follow-up.

Process or output

- Proportion of discharged small and sick newborns whose hearing has been tested before discharge.
- Proportion of discharged small and sick newborns whose vision has been tested before discharge.
- Proportion of multidisciplinary staff who care for newborns who have received training and regular refresher sessions in developmental follow-up at least once.
- Proportion of discharged newborns who return for scheduled developmental follow-up.

Outcome

- Proportion of discharged small and sick newborns who have language, motor or cognitive delay at 12 months.

References

- Spittle A, Orton J, Anderson PJ, Boyd R, Doyle LW. Early developmental intervention programmes provided post hospital discharge to prevent motor and cognitive impairment in preterm infants. *Cochrane Database Syst Rev*. 2015;(11):CD005495.
- Puthussery S, Chtiyami M, Tseng PC, Kilby L, Kapadia J. Effectiveness of early intervention programs for parents of preterm infants: a meta-review of systematic reviews. *BMC Pediatrics*. 2018;18:223.
- Boykova M, Kenner C. Transition from hospital to home for parents of preterm infants. *J Perinat Neonat Nurs*. 2012;26(1):81–7.
- Zuckerman BS, Beardslee WR. Maternal depression: a concern for pediatricians. *Pediatrics*. 1987;79:110–7.
- Zelkowitz P, Na S, Wang T, Bardin C, Papageorgiou A. Early maternal anxiety predicts cognitive and behavioural outcomes of VLBW children at 24 months corrected age. *Acta Paediatr*. 2011;100(5):700–4.
- Purdy IB, Craig JW, Zeanah P. NICU discharge planning and beyond: recommendation for parent psychosocial support. *J Perinatol*. 2015;35:S24–8.
- Developmental follow-up of children and young people born preterm. Clinical guideline. London: National Institute for Health Care and Excellence; 2017.
- Developmental follow-up of children and young people born preterm. Quality standard. London: National Institute for Health Care and Excellence; 2018.





STANDARD 7

COMPETENT, MOTIVATED, EMPATHETIC, MULTIDISCIPLINARY HUMAN RESOURCES

Standard 7: For every small and sick newborn, competent, motivated, empathetic, multidisciplinary staff are consistently available to provide routine care, manage complications and provide developmental and psychological support throughout the care pathway.

Quality statement 7.1: All small and sick newborns have access to a sufficient multidisciplinary workforce, including health professionals, allied health and support staff, at all times according to standard levels of care.

Rationale: The survival of preterm infants in facilities has been linked to the number of qualified neonatal nurses working per shift. Very sick or extremely preterm newborns require higher ratios of staff to patient than other paediatric patients. There are no international standards for staffing ratios. In the United Kingdom, a nurse to patient ratios of 1:1 is recommended for neonatal intensive care, 1:2 for high-dependency units and 1:4 for special care. India recommends 1:3 or 1:4 for special care; and South Africa recommends 1:1 or 1:2 for intensive care, 1:2 or 1:3 for high-dependency care and 1:6 for standard inpatient or kangaroo mother care units. Small and sick newborns have many needs; all require developmental care during admission and on discharge, and some may require access to medical and allied health specialists, depending on their problems.



QUALITY MEASURES

Input

- The health facility has an administrative directive for the standard level of care that the health facility provides and the staffing required to achieve that standard, including staffing criteria and the numbers, types and competence (job description) of each staff member, which is reviewed regularly according to the work load.
- The health facility has sufficient numbers of competent, licensed, motivated, regulated newborn health professionals with a mix of appropriate skills, working in multidisciplinary teams.
- The health facility has an administrative directive that ensures minimal rotation of nurses with neonatal skills.
- The health facility has written standard operating procedures to ensure that nurses with neonatal skills are authorized to provide interventions including commencing resuscitation and giving oxygen and antibiotics.
- The health facility has written standard operating procedures for shifting and sharing essential tasks, including cleaning equipment, restocking and newborn feeding, that ensure safe care for small and sick newborns.

Process or output

- Proportion of health professionals who care for small and sick newborns in the facility who have had neonatal training or in-service medical education in newborn care.
- Proportion of nurses with neonatal skills who were rotated to other patient care areas within the health facility during the previous 12 months.
- Proportion of nurses with neonatal skills who are authorized to provide newborn interventions, including commencing resuscitation and giving oxygen and antibiotics, in the absence of a physician.
- Proportion of qualified health care professionals in the health facility working per shift in relation to the documented standard.

Outcome

- Proportion of newborns in the health facility who were attended by health professionals specifically trained in neonatal care.
- Proportion of carers of newborns who attended the health facility who reported satisfactory, prompt access to appropriate medical and support staff when required.
- Proportion of health professional and support staff in the health facility who are satisfied with their workload and their roles and responsibilities in the facility or the unit to which they are assigned.
- Proportion of all health professional staff who care for newborns in the health facility who left the facility or were transferred during the previous 12 months.

Quality statement 7.2: Health professionals, allied health and support staff have appropriate skills to support the health, psychological, developmental, communication and cultural needs of newborn and their families.

Quality statement 7.3 NEW: All staff working in neonatal units of the health facility have the necessary knowledge, skills and attitudes to provide infection prevention and control, basic resuscitation, kangaroo mother care, safe feeding and medications and positive interaction with newborns and communication with carers.

Rationale for quality statements 7.2 and 7.3: A neonatal multidisciplinary team is essential for the care of newborns during admission and for follow-up after discharge in high-income countries. The team should consist of medical and nursing staff with specific neonatal skills but also allied health professionals such as physiotherapists, speech therapists, occupational therapists, psychologists, dieticians, lactation consultants, pharmacists, audiologists and social workers. Newborns with congenital abnormalities or other surgical conditions may require neonatal surgical services, and some families may require access to genetic services.

Neonatal nursing skills are highly valuable, and nurses with these skills should remain in facility areas that provide care to small and sick newborns to ensure the quality of care and provide mentorship and supervision of more junior staff. The health professionals who care for small and sick newborns must have the necessary skills for prevention and control of infection, basic resuscitation, kangaroo mother care, provision of safe feeding and medications and positive interaction with newborns and should have the correct attitude for communication with carers.

Small and sick newborns deteriorate quickly; therefore, nurses with neonatal skills should be authorized to provide interventions such as prescribing oxygen or antibiotics in the absence of a physician. If staff numbers are limited, clear written guidelines and orientation should be available for shifting and sharing essential tasks, including cleaning equipment, restocking and newborn feeding.



QUALITY MEASURES FOR QUALITY STATEMENTS 7.2 AND 7.3

Input

- The health facility has a programme for targeted continuing professional education and skills development for all professionals and support staff who care for small and sick newborns.
- The health facility has a mechanism to ensure that every health professional who cares for newborns and their families delivers care based on the best available evidence and clinical expertise, according to available resources and the wishes of the family.

- The health facility periodically appraises all staff, has a mechanism for recognizing good performance and has protocols for staff feedback.
- The health facility provides an enabling, supportive environment for professional staff development, with regular supervision and mentoring.
- The health facility facilitates inter-professional collaborative practice, with clear roles and responsibilities for quality improvement according to the professional scope of practice and the needs for newborn care.

Process or output

- Proportion of health professionals who care for small and sick newborns in the health facility who have completed inter-professional education to improve the delivery of practice in the care of newborns and their families.
- Proportion of health professionals who care for small and sick newborns in the health facility who have received training in a competence-based curriculum and assessment framework.
- Proportion of health professionals who care for small and sick newborns in the health facility who receive training in neonatal resuscitation every 12 months.
- Proportion of health professionals who care for small and sick newborns who maintain their competence to provide safe, effective care in simulation-based learning every 12 months.
- Number of supervisory visits to the health facility to improve clinical competence and performance in the previous 12 months.
- Proportion of staff at the health facility whose performance was assessed and feedback provided at least once in the previous 12 months.
- Proportion of staff who had interactions with professional mentors to ensure their clinical competence and to improve their performance in the previous 3 months.

Outcome

- Proportion of health professionals and support staff who care for newborns at the health facility whose preceding performance appraisal was satisfactory.
- Proportion of all carers of newborns at the health facility who were satisfied with the care and support they received from facility staff.
- Proportion of staff working in neonatal units in the health facility who have the appropriate knowledge and skills to provide infection prevention and control, basic resuscitation, kangaroo mother care, safe feeding and medications and the necessary attitudes for positive interactions with newborns and communication with carers.

Quality statement 7.4: Every health facility that provides care for small and sick newborns has managerial leadership for developing and implementing policies and legal entitlements, clinical governance and fostering an environment for continuous quality improvement.

Rationale: Health professionals who care for small and sick newborns should have the core competence, holistic skills and empathy towards this vulnerable group. The health facility should provide a programme for continuing professional education and skills development for all professionals and support staff. Excellent care for small and sick newborns requires strong managerial leadership and advocacy. The needs of newborns are specific, and managers should support the development of the specialist neonatal nursing cadre in a competence-based curriculum and accreditation by international standards, experienced trainers, skills-based in-service learning and supervision. Continuous quality improvement must include issues specific to newborns and opportunities for neonatal death reviews



QUALITY MEASURES

Input

- The health facility has mechanisms to support staff who care for small and sick newborns, including appropriate hours of working, an appropriate ratio of newborns to staff and emotional support.
- The health facility team includes a specialist neonatal nursing cadre with competence-based training and accreditation by international standards.
- The health facility has a written, up-to-date leadership structure, with defined roles and responsibilities, standard governing policies and protocols and lines for reporting and accountability.
- The health facility has a written, up-to-date plan for ensuring patient safety and improving the quality of care.
- The health facility has a team or at least one person designated to champion or lead initiatives for improving the quality of care in the facility.
- The health facility has a costed, budgeted plan and established mechanisms to support identified activities for quality improvement.
- The health facility has a system for regular meetings between administrators and health professionals to exchange information on the performance of staff and of the facility leadership to ensure quality.
- The health facility holds at least one meeting a month to review data, monitor performance, make recommendations to address any problems, honour good performance and encourage staff or teams who are struggling to improve their quality.

- The health facility holds at least two meetings a year with stakeholders (e.g. the community, service users, partners) to review its performance, identify problems and make recommendations for joint actions to improve quality.

Process or output

- Proportion of health facility leaders trained in quality improvement leadership and management, data use and leading change (use of information, enabling behaviour, continuous learning).
- Evidence that the health facility regularly tracks and monitors performance to improve the quality of care from up-to-date dashboards or performance charts.
- Proportion of all staff at the health facility who can identify and report on at least one activity for improving clinical quality in which they were personally involved in the previous six months.

Outcome

- Proportion of staff members who give positive feedback about internal policies and activities for continuous quality improvement, including in-service training and personal mentoring.
- Proportion of health professionals who actively participated in a quality improvement activity (meeting, audit, project) in the health facility in the previous 12 months.

References

- Standards for improving the quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.
- Standards for improving the quality of care for children and young adolescents in health facilities. World Health Organization; 2018.
- National Health Service, Department of Health. Toolkit for high quality neonatal services. London: Department of Health; 2009.
- Optimal arrangements for neonatal intensive care units in the UK including guidance on their medical staffing. A framework for practice. London: British Association of Perinatal Medicine; 2014.
- Toolkit for setting up of special care units, stabilization units and newborn care units. New Delhi: UNICEF India; 2009.
- Norms and standards for essential newborn care. Chapter 2 in Essential newborn care. Polokwane: Limpopo Initiative for Newborn Care; 2016 (<http://www.lincare.co.za/wp-content/uploads/2016/06/Chapter-2-Norms-and-Standards-for-Essential-Newborn-Care.pdf>, accessed 28 July 2020).
- Moxon SG, Lawn JE, Dickson KE, Simen-Kapeu A, Gupta G, Deorari A, et al. Inpatient care of small and sick newborns: a multi-country analysis of health system bottlenecks and potential solutions. BMC Pregnancy Childbirth. 2015;15(Suppl 2):S7.
- Zaka N, Alexander EC, Manikam L, Norman ICF, Akhbari M, Moxon S, et al. Quality improvement initiatives for hospitalised small and sick newborns in low- and middle-income countries: a systematic review. Implement Sci. 2018;13(1):20.
- Every newborn: an action plan to end preventable deaths. Geneva: World Health Organization; 2014.

- Born too soon: the global action report on preterm birth. Geneva: World Health Organization; 2012.
- Service standards for hospitals providing neonatal care. Third edition. London: British Association of Perinatal Medicine; 2010.
- Hamilton KE, Redshaw ME, Tarnow-Mordi W. Nurse staffing in relation to risk-adjusted mortality in neonatal care. *Arch Dis Childh Fetal Neonat Ed.* 2007;92(2):F99–103.
- Save our special care babies; save our specialist nurses: a Bliss report on cuts to frontline care for vulnerable babies. London: Bliss; 2011.
- WHO recommendations: optimizing health worker roles to improve access to key maternal and neonatal health interventions through task shifting. Geneva: World Health Organization; 2012.
- Opiyo N, English M. In-service training for health professionals to improve care of seriously ill newborns and children in low-income countries. *Cochrane Database Syst Rev.* 2015;(5): CD007071.
- Australian standards for neonatal nurses. Third edition. Camperdown: Australian College of Neonatal Nurses Inc.; 2012.
- Core competencies in adolescent health and development for primary care providers: including a tool to assess the adolescent health and development component in pre-service education of health-care providers. Geneva: World Health Organization; 2015.
- Sexual and reproductive health core competencies in primary care: attitudes, knowledge, ethics, human rights, leadership, management, teamwork, community work, education, counselling, clinical settings, service, provision. Geneva: World Health Organization; 2011.



STANDARD 8

ESSENTIAL PHYSICAL RESOURCES FOR SMALL AND SICK NEWBORNS AVAILABLE

Standard 8: The health facility has an appropriate physical environment, with adequate water, sanitation, waste management, energy supply, medicines, medical supplies and equipment for routine care and management of complications in small and sick newborns.

Quality statement 8.1: Small and sick newborns are cared for in a safe, secure, well-maintained, organized physical environment that is appropriately designed to provide kangaroo mother care and family-centred care according to standard levels of care.

Rationale: The physical environment of small and sick newborns should be of good quality, safe, secure, well-maintained and organized, with an adequate energy supply and appropriately designed according to standard levels of care. Where appropriate, the design must include a fully equipped unit or area for kangaroo mother care, with amenities for rooming-in and a family-centred facility so that mothers and carers can learn and practise the skills for caring for their newborns.



QUALITY MEASURES

Input

- The health facility is designed to provide seamless access to dedicated areas for the care of small and sick newborns, which are separate from reception, emergency care, outpatient and inpatient areas or wards.
- The health facility practises and has the appropriate space and facilities for kangaroo mother care, family-centred care and rooming-in for mothers or carers with their newborns 24 h a day.
- The health facility has a room or a screened-off area in the outpatient department and on wards that ensures normal conversation without being overheard and for examination of newborns unobserved by other patients.
- The surgical services of the health facility have dedicated recovery and hospitalization areas for newborns that are located close to the newborn unit.
- The health facility is adequately maintained, safe, clean, appropriately lit and well ventilated and ensures privacy for newborns and their families when required.
- The health facility has a power source (e.g. solar, generator, grid) that can meet all the demands of the facility and associated infrastructure for electricity at all times, with a back-up power source.
- The health facility has an energy management plan with an adequate budget, maintained by appropriately trained staff and regulated by a competent authority.
- The health facility has a fuel management plan and a local buffer stock, with an adequate budget for all the fuel required for vehicles, cooking and heating, as relevant and as required, at all times.
- The health facility has sufficient funds and staff for rehabilitation, improvement and continuous operation and maintenance of the infrastructure.
- The health facility has sufficient safety measures, including safe windows and doors, operational fire extinguishers for each area and floor, a clearly designed plan of evacuation in case of emergency and sufficient external barriers.

Process or output

- Number of power failures lasting > 2 h during the previous month.

Outcome

- Proportion of all families of small and sick newborns who attended the health facility who were satisfied with its cleanliness and amenities.
- Proportion of families of small and sick newborns who attended the health facility who would recommend the health facility to friends and family.

Quality statement 8.2: Water, sanitation, hand hygiene and waste disposal facilities are easily accessible, functional, reliable, safe and sufficient to ensure strict infection control and meet the needs of newborns, carers and staff.

Rationale: The prevention and control of infection in newborn units is crucial to prevent nosocomial infections. Although simple hand-washing is a proven intervention, clear guidance is necessary. In the United Kingdom, one washbasin is recommended for three cots in special care units, and in India one hand-washing station is recommended 6 m from each newborn bed. WHO recommends at least one functioning hand hygiene station per 10 beds, with soap and water or alcohol-based hand-wash. Basic water, sanitation and waste disposal facilities are a minimum requirement for good quality newborn care at all levels. In a room with fewer than 10 beds, one functioning hand hygiene station will be required. Carers should have access to a functioning hand hygiene station in the room in which their newborn is being cared for in the health facility. Improved sanitation facilities are usable, with at least one toilet dedicated for staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for people with limited mobility.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols, standard operating procedures and awareness-raising materials (e.g. posters) on cleaning, disinfection, hand hygiene, maintenance of water, sanitation and hygiene facilities and safe waste management.
- The health facility has a functioning source of safe water on the premises that is adequate to meet all demands (according to WHO standards), for drinking, personal hygiene, medical interventions, cleaning, laundry and cooking for use by staff and carers of newborns.
- The health facility has leak-proof, covered, labelled waste bins and impermeable sharps containers in every treatment area to ensure segregation of waste into three categories: sharps, non-sharps infectious waste and general non-infectious waste.
- The health facility has at least one functioning hand hygiene station with soap and water and alcohol-based hand rubs at the entrances to all units and in all rooms where small and sick newborns are cared for.
- A health facility that offers surgery has a designated station for preoperative hand scrubbing and adequate supplies of appropriate surgical scrub materials.
- The health facility has adequate laundry facilities, including water, detergent and space for drying.
- The health facility has sufficient funds for rehabilitation, improvement and continuous operation and maintenance of water, sanitation, hygiene and waste management infrastructure.

- The health facility has sufficient trained, competent staff for cleaning, operating and maintaining water, sanitation, hygiene and health care waste facilities, on site when needed, and clear descriptions of their responsibilities.
- Health professionals and support staff and carers are educated and trained in good hygiene, including regular hand-washing after changing diapers, before feeding and after using toilets.
- The health facility has an environmental health management risk plan, with an adequate budget, for managing and improving water, sanitation, hygiene and waste management services, including infection prevention and control.
- The health facility staff promote safe hygiene practices in caring for newborns, including safe disposal and management of newborn's faeces.

Process or output

- Proportion of carers who have access to a functioning hand hygiene station in the room in which their newborn is being cared for in the health facility.
- Proportion of carers who have access to a functioning usable toilet/latrine in the health facility in which their newborn is being cared for. Proportion of days in the previous three months when water from an improved source was not available on the premises.
- Proportion of days in the previous three months when soap or hand disinfectant was not available.
- Proportion of days per calendar year on which wastes were not safely segregated into at least three bins in the consultation area and sharps and infectious wastes were not treated and disposed of safely.
- Proportion of health professionals and support staff in the health facility who received training or mentoring in sanitation, hand hygiene and infection prevention and control in the previous six months.

Outcome

- Proportion of carers of newborns at the health facility who are satisfied with the water, sanitation and waste management services.
- Proportion of carers of newborns who attended the health facility who observed that the health providers washed their hands or used an alcohol rub before examining them.
- Proportion of admitted newborns who have a documented hospital-acquired infection.

Quality statement 8.3: Equipment designed specifically for the medical care and developmental and emotional support of small and sick newborns is available at all times.

Rationale: Small and sick newborns require specifically designed equipment in appropriate sizes for medical and developmental care and emotional support. Functioning newborn equipment is required for neonatal emergency resuscitation with airway, breathing and circulation support and continuous care. Effective administration of oxygen to newborns requires equipment of the

correct size. All equipment must be well maintained, with instructions available in a clear, legible format for resolving any problem with equipment. A well-equipped allied health therapy unit should be available for neurodevelopmental support of small and sick newborns.

Newborns' problems should be diagnosed promptly, including by point-of-care testing of blood and urine, so that appropriate management can be initiated immediately. Point-of-care devices and testing strips, such as for blood glucose, bilirubin and haemoglobin, minimize taking blood from small and sick newborns, thus preventing unnecessary distress and avoiding precipitation of anaemia.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols or standard operating procedures for the selection, procurement and maintenance of neonatal equipment by level of care according to WHO guidelines.
- The health facility has functioning, clean, age-appropriate essential equipment and supplies for routine care and management of complications at all times in all areas for newborn care.
- Equipment user manuals and instructions are available, with laminated job aids on operation and use of the equipment.
- The health facility has a functioning, well-equipped resuscitation trolley for neonatal emergency resuscitation and care with readily accessible, identifiable age-appropriate medicines, resuscitation equipment and supplies (e.g. suction device, pulse oximeter, laryngoscope, endotracheal tubes, self-inflating bags and face masks, neonatal intravenous cannulas and infusion sets) available at all times in areas designated for emergency care in outpatient areas and inpatient wards.
- The health facility has a safe, uninterrupted source of medical gases (air and oxygen), oxygen blender and equipment for delivery of respiratory support (age-appropriate nasal prongs, catheters, face masks, humidifier, pulse oximeter) available at all times in the neonatal unit and emergency areas.
- The health facility has basic diagnostic and laboratory equipment (X-ray including mobile X-ray for sick newborns, ultrasound and laboratory equipment) for diagnosis and management of common newborn illnesses and conditions.
- The health facility has a diagnostic service available 24 h a day, 7 days per week for performing urgent tests.
- The health facility has basic equipment for point-of-care testing that is functioning at all times, with appropriate devices and testing strips and no stock-outs, including for blood glucose, urine, bilirubin and haemoglobin, for diagnosis of common newborn illnesses and conditions.
- The health facility has a functioning newborn resuscitation table, incubators and cots for small and sick newborns and appropriate furnishings (beds, chairs, cupboards) for carers in the neonatal unit or areas designated for newborn care, including kangaroo mother care units and rooming-in facilities.

- The health facility has an adequate supply of peripheral neonatal intravenous cannulas, intravenous lines, infusion pumps, neonatal burettes, safe blood and blood warmers, with no stock-outs.
- The health facility has a dedicated budget for purchasing and maintaining essential equipment for the care of small and sick newborns.
- The health facility has the minimum requirements for an adequate cold chain, with a functioning refrigerator and a temperature monitoring device, and the temperature has been maintained between 2 and 8 °C for the previous 30 days.
- The health facility has a well-equipped allied health therapy unit for developmental support of small and sick newborns.

Process or output

- Proportion of days per calendar year during which one or more essential items of newborn equipment was non-functional.

Outcome

- Proportion of days per calendar year during which an oxygen source and delivery system appropriate for small and sick newborns were not available.
- Proportion of reviewed neonatal deaths in which the newborn did not receive appropriate care because of lack of essential age-appropriate equipment.

Quality statement 8.4: Adequate stocks of medicines and medical supplies specific for small and sick newborns are available for routine care and for management of complications.

Rationale: Management of common illnesses in small and sick newborns requires the availability at all times of standard medications and fluids for stabilization and continuous care, including Ringer's lactate or normal saline, 10% dextrose, ampicillin, gentamicin, phenobarbitone and vitamin K. Other medicines and medical supplies should be available according to the identified standard level of care of the health facility. Laboratory facilities are required to perform standard diagnostic tests for newborns.



QUALITY MEASURES

Input

- The health facility has written, up-to-date guidelines, protocols or standard operating procedures for safe storage of medicines in designated pharmacy cupboards or stores and for safe administration.
- The health facility has an on-site pharmacy with trained pharmacists or dispensers available during all facility operating hours, who maintain an essential list of

newborn-appropriate medicines and supplies, adequate stocks and an efficient stock management system.

- The health facility has supplies of emergency and pre-referral medicines and fluids, including Ringer's lactate or normal saline, 10% dextrose, injectable antibiotics and anti-convulsants that are readily accessible for severely ill newborns.
- The health facility has supplies of first- and second-line injectable antibiotics, vitamin K, surfactant, caffeine or other methylxanthines, corticosteroids and other essential medicines available at all times for the management of newborns.
- The health facility has supplies of thermometers, weighing scales and length boards for measuring crown-to-heel length and tape measures for measuring head circumference.
- The health facility has supplies of essential vaccines available at all times for vaccination of newborns.
- The facility has a system for the storage and distribution of all vaccines and their diluents in a cold-chain system maintained at the WHO-recommended temperature range at all times.
- The health facility has adequate essential equipment and medical supplies, including a reliable source of air and oxygen, pulse oximeter, air-oxygen blender and oxygen administration equipment, for routine and emergency management of small and sick newborns.
- The health facility has essential laboratory supplies (e.g. needles, reagents, specimen bottles) for routine and emergency management of newborns.

Process or output

- Proportion of health professionals who care for small and sick newborns who have received training in safe use of medication, including correct medication, correct route, dose calculations, checking, administering and monitoring and managing the newborn for adverse reactions.

Outcome

- Proportion of days in the previous three months when oxygen and newborn-appropriate accessory equipment were not available in areas of the health facility where care is provided for newborns.
- Proportion of days in the previous three months when air was not available in areas of the health facility where care is provided for newborns.
- Proportion of reviewed neonatal deaths in which the newborn did not receive appropriate care because of lack of essential medicines or supplies.

Quality statement 8.5 NEW: All carers of small and sick newborns have access to a dedicated area with supportive elements including adequate space for kangaroo mother care, family-centred care, privacy for mothers to express breast milk and facilities for hygiene, cooking and laundry.

Rationale: A dedicated area with adequate space for kangaroo mother care, family-centred care, privacy for mother to express breast milk and facilities for hygiene, cooking and laundry are necessary for mothers and carers to learn and practise skills for caring for their newborns. Mothers and families have reported difficulty in providing care for their newborns in health facilities because of lack of basic accommodation and amenities.



QUALITY MEASURES

Input

- The health facility has a dedicated area for provision of kangaroo mother care and family-centred care close to the special care nursery.
- The health facility has appropriate infrastructure for provision of kangaroo mother care and family-centred care, including an appropriate space for families, with amenities for hygiene, toilet, cooking and laundry.
- The area for provision of kangaroo mother care and family-centred care is well maintained, and all amenities, including infrastructure, water, sanitation, cooking and lighting, are functional at all times.
- The health facility has appropriate space and amenities for the expression and safe storage of maternal breast milk and privacy for mothers to breastfeed.

Process or output

- Proportion of days in the previous three months when any amenities in the area for provision of kangaroo mother care and family-centred care were malfunctioning and were not repaired within 24 h.

Outcome

- Proportion of all families of small and sick newborns who attended the health facility who were satisfied with the dedicated space for the provision of kangaroo mother care and family-centred care.
- Proportion of preterm and low-birth-weight babies admitted to the health facility who received kangaroo mother care.

References for quality statements 8.1, 8.2, 8.3, 8.4 and 8.5

- Standards for improving quality of maternal and newborn care in health facilities. Geneva: World Health Organization; 2016.
- Standards for improving quality of care for children and young adolescents in health facilities. Geneva: World Health Organization; 2018.
- Australasian health facility guidelines. Part B. Health facility briefing and planning 0390 – intensive care – neonatal special care nursery. Sydney: Australasian Health Infrastructure Alliance; 2016.
- Toolkit for setting up of special care units, stabilization units and newborn care units. New Delhi: UNICEF India; 2009.

- Neonatal units: planning and design (HBN 09–03). London: Department of Health; 2013.
- Neonatal units: planning and design manual 8720. Version 0.6 England. London: Department of Health; 2011.
- Toolkit for high quality neonatal services. Newborn care charts. London: Department of Health; 2009.
- Optimal arrangements for neonatal intensive care units in the UK including guidance on their medical staffing. A framework for practice. London: British Association of Perinatal Medicine; 2014.
- UNICEF, WHO, World Bank. Packages of interventions: family planning, safe abortion care, maternal, newborn and child health. Geneva: World Health Organization, 2010.
- Interagency list of priority medical devices for essential interventions for reproductive, maternal, newborn and child health. Geneva: World Health Organization; 2016.
- WHO Model List of Essential Medicines (2017). Service availability and readiness assessment. An annual monitoring system for service delivery. Reference manual. Version 2.2. Geneva: World Health Organization; 2017.
- Moxton SG, Guenther T, Gabrysch S, Enweronu-Laryea C, Ram PK, Niermeyer S, et al. Service readiness for inpatient care of small and sick newborns: what do we need and what can we measure now? *J Glob Health*. 2018;8(1):010702.
- Gabrysch S, Civitelli G, Edmond KM, Mathai M, Ali M, Bhutta SA, et al. New signal functions to measure the ability of health facilities to provide routine and emergency newborn care. *PLoS Med*. 2012;9(11):1001340.
- Diaconu K, Chen YF, Cummins C, Jimenez Moyao G, Manaseki-Holland S, Lilford R. Methods for medical device and equipment procurement and prioritization within low- and middle-income countries: findings of a systematic literature review. *Global Health*. 2017;13(1):59.
- Forty-sixth report of the WHO Expert Committee on specifications for pharmaceutical preparations. (WHO Technical Report Series; No. 970). Geneva: World Health Organization; 2012.
- Essential interventions, commodities and guidelines for reproductive, maternal, newborn and child health. Geneva: Partnership for Maternal, Newborn and Child Health; 2011.
- Every woman every child, United Nations Commission on Life-saving Commodities for Women and Children. Commissioners' report. New York City (NY): United Nations; 2012.
- The global strategy for women's, children's and adolescents' health (2016–2030). Geneva: World Health Organization; 2016.
- United Nations Commission on Life-saving Commodities, Amref Health Africa. A toolkit for implementing health services. New York City (NY): United Nations; 2015.

Quality statement 8.6 NEW: In humanitarian and fragile settings, including outbreaks and pandemic situations, provision of a safe, secure environment for the care of small and sick newborn is included in preparedness, response and recovery plans.

Rationale: Newborns in fragile and humanitarian settings have limited or no access to cost-effective, lifesaving interventions, and the gaps in equity will continue to widen, while other countries move forward in reducing neonatal and child mortality. The supporting systems and host populations often lack the will or capacity to meet the basic needs of displaced people in their communities. The challenges for mothers and newborns in conflict settings are compounded by insecurity and the natural focus of services on trauma and population safety.

Outbreaks such as the COVID-19 pandemic challenge health systems across the world. Rapidly increasing demand for care of people with COVID-19 is compounded by fear, misinformation and limitations on the movement of people and supplies, which disrupts the delivery of front-line health care for all people. When health systems are overwhelmed and people cannot access the services they need, both direct and indirect mortality from preventable and treatable conditions increases, particularly for vulnerable populations such as newborns, who are some of the most vulnerable of all.

During the preparedness, emergency and recovery phases of humanitarian response, outbreaks and global pandemics, the priority of newborn health should be clearly raised in discussions for coordination and advocacy. Integration of development initiatives for preparedness and resilience-building into emergency response can mitigate the long-term impact of crisis on the health of women and children.

WHO guidance during the COVID 19 pandemic clearly reinforces the principle that mothers and newborns should not be separated and that newborn health services, including the care of small and sick newborns, are essential and should be continued while ensuring strict infection prevention and control and the use of personal protective equipment.

The international community has prepared *Newborn health in humanitarian settings: field guide* and *Infant and young child feeding in emergencies, operational guidance for emergency relief staff and programme managers* to assist such newborns. Medicines, supplies and equipment to care for small and sick newborns in humanitarian settings are available in “minimal initial service packages” for emergencies, and newborn supply kits are available for use at community, primary and hospital levels. Coordination with lead agencies is required to manage newborns in humanitarian settings and arrange a safe referral network plan.



QUALITY MEASURES

Input

- Preparedness, response and recovery plans for humanitarian and fragile settings and in outbreak and pandemic situations include provision of coordinated care for newborns and their families.

- The administration of the health facility setting knows and communicates with the organization that is leading the sexual and reproductive health response to the humanitarian crisis, outbreak or pandemic situation to ensure coordination.
- The health facility setting in a humanitarian response, outbreak or pandemic situation provides care for small and sick newborns without discrimination.
- The health facility setting has written, up-to-date guidelines, protocols and standard operating procedures to care for small and sick newborns in humanitarian settings and in outbreak and pandemic situations that are consistent with *Newborn health in humanitarian settings: field guide* and *Infant and young child feeding in emergencies* and WHO guidance during emergencies (e.g. guidance during the COVID 19 pandemic).
- The health facility setting in a humanitarian response, outbreak or pandemic situation has access to medicines, supplies and equipment to care for small and sick newborns, including sufficient minimal initial service packages and newborn supply kits and personal protective equipment for community, primary and hospital levels.
- The health facility setting has standard operating procedures and mechanisms to ensure that there is a safe referral network plan for small and sick newborns in humanitarian and fragile settings and in outbreak and pandemic situations.
- The health facility setting has a mechanism to collect, analyse and use data on newborn health in humanitarian and fragile settings and in outbreak and pandemic situations.

Process or output

- Proportion of health facilities in humanitarian settings and in outbreak and pandemic situations that provide kangaroo mother care.
- Proportion of health facilities with delivery services that can provide neonatal resuscitation.

Outcome

- Proportion of newborns in the health facility in the catchment area of a humanitarian setting and of an outbreak or pandemic situation who died.
- Proportion of newborns in the catchment area of the health facility in the humanitarian setting and in outbreak and pandemic situations who were born preterm.

References

- Save the Children, United Nations Children's Fund, World Health Organization, United Nations High Commissioner for Refugees. *Newborn health in humanitarian settings: field guide*. New York City (NY): Save the Children; 2019.
- Save the Children, United Nations Children's Fund, World Health Organization, United Nations High Commissioner for Refugees. *Infant and young child feeding in emergencies. Operational guidance for emergency relief staff and programme managers*. New York City (NY): Save the Children; 2019.
- Save the Children, United Nations Children's Fund, World Health Organization, United Nations High Commissioner for Refugees. *Roadmap to accelerate progress for every newborn in humanitarian settings 2020–2025*. New York City (NY): Save the Children; 2019.

- Maintaining essential health services: operational guidance for the COVID-19 context, 1 June 2020. Geneva: World Health Organization; 2020 (<https://www.who.int/publications/i/item/10665-332240>, accessed 29 July 2020).
- International Federation of Red Cross and Red Crescent Societies, United Nations Children's Fund, World Health Organization. Community-based health care, including outreach and campaigns, in the context of the COVID-19 pandemic. Interim guidance May 2020. Geneva: World Health Organization; 2020.
- Clinical management of COVID-19. Interim guidance 27 May 2020. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>, accessed 28 July 2020).
- Q&A on COVID-19, pregnancy, childbirth and breastfeeding. Geneva: World Health Organization; 2020 (<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-on-covid-19-pregnancy-and-childbirth>, accessed 28 July 2020).
- Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Geneva: World Health Organization; 2020 ([https://www.who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125), accessed 28 July 2020).
- Coronavirus disease (COVID-19) outbreak: rights, roles and responsibilities of health workers, including key considerations for occupational safety and health. Geneva: World Health Organization; 2020 ([https://www.who.int/publications/i/item/coronavirus-disease-\(covid-19\)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health](https://www.who.int/publications/i/item/coronavirus-disease-(covid-19)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health), accessed 28 July 2020).

Annex 1. Participants in the informal consultation on human rights in newborn care, Geneva, 9 April 2019

Elena Ateva, The White Ribbon Alliance,
Washington DC, USA

Andrew Clarke, Save the Children UK,
London, United Kingdom

Queen Dube, Blantyre College of Medicine,
Blantyre, Malawi

Laura Ferguson, Kek School of Medicine,
University of Southern California, Los
Angeles (CA), USA

Anne Grandjean, UNICEF, Geneva,
Switzerland

Imma Guerras Delgado, Office of the High
Commissioner for Human Rights, Geneva,
Switzerland

Tedbabe Hailegabriel, UNICEF, New York City
(NY), USA

Lily Kak, US Agency for International
Development, Washington DC, USA

Carolyn MacLennan, WHO consultant, Alice
Springs, Australia

Silke Mader, European Foundation on the
Care of Newborn Infants, Munich, Germany

Arti Maria, All-India Institute of Medical
Sciences, New Delhi, India

Socorro Mendoza, Kangaroo Mother Care
Foundation, Manila, Philippines

Benyam Mezmur, University of Western
Cape, Durban, South Africa

Emma Sacks, Johns Hopkins University,
Baltimore (MD), USA

Theresa Shaver, USAID, Washington DC, USA

Charlotte Warren, Population Council,
London, United Kingdom

Annex 2. Participants in the technical meeting on standards of care for small and sick newborns, Geneva, 10–12 April 2019

Samira Aboubaker, WHO consultant, Geneva, Switzerland

Elena Ateva, The White Ribbon Alliance, Washington DC, USA

Amina Barakat, Electronic medical records consultant, Rabat, Morocco

Nelan Bhardway, United Nations Population Fund, New York City (NY), USA

Nancy Bolan, WHO consultant, Divonne, France

Nathalie Charpak, Fundação Canguro Bogotá, Bogotá, Colombia

Andrew Clarke, Save the Children UK, London, United Kingdom

Queen Dube, Blantyre College of Medicine, Blantyre, Malawi

Laura Ferguson, Kek School of Medicine, University of Southern California, Los Angeles, USA

Ted babe Hailegabriel, UNICEF, New York City (NY), USA

Lily Kak, US Agency for International Development, Washington DC, USA

Neena Khadka, Maternal and Child Survival Program, Washington DC, USA

Catherine Kirk, Partners In Health – Rwanda, Kigali, Rwanda

Jim Litch, EveryPreemie, Global Alliance to Prevent Prematurity and Stillbirth, Lynnwood (WA), USA

Silke Mader, European Foundation on the Care of Newborn Infants, Munich, Germany

Arti Maria, Postgraduate Institute of Medical Education and Research and Dr Ram Manohar Lohia Hospital, Delhi, India

Carolyn MacLennan, WHO consultant, Alice Springs, Australia

Socorro Mendoza, Kangaroo Mother Care Foundation, Manila, Philippines

Georgina Murphy, Bill & Melinda Gates Foundation, Seattle (WA), USA

Karen New, WHO consultant, Queensland, Australia

Assaye Nigussie, Bill & Melinda Gates Foundation, Seattle (WA), USA

Jesca Nsungwa-Sabiiti, Ministry of Health, Kampala, Uganda

Sue Prullage, Council of International Neonatal Nurses, Danville (VA), USA

Anu Sachdeva, All-India Institute of Medical Sciences, New Delhi, India

Emma Sacks, Johns Hopkins University, Baltimore (MD), USA

Isabella Sagoe-Moses, Ministry of Health, Accra, Ghana

Manuel Sanchez Luna, Head, Neonatal Unit Madrid, Madrid, Spain

Theresa Shaver, US Agency for International Development, Washington DC, USA

Nalini Singhal, American Academy of Pediatrics, Calgary, Canada

Merran Thomson, National Essential Survival Technology project, Chiesi Foundation, Uxbridge, United Kingdom

Karen Walker, Council of International Neonatal Nurses, Sydney, Australia

Charlotte Warren, Population Council, London, United Kingdom

Bogale Worku, Ethiopian Pediatrics Society, Addis Ababa, Ethiopia

Annex 3. Contributors to consultations on quality measures

Samira Aboubaker, WHO consultant, Geneva, Switzerland

Elena Ateva, The White Ribbon Alliance, Washington DC, USA

Amina Barakat, Electronic medical records consultant, Rabat, Morocco

Nelan Bhardway, United Nations Population Fund, New York City (NY), USA

Nancy Bolan, WHO consultant, Divonne, France

Nathalie Charpak, Fundação Canguro Bogotá, Bogotá, Colombia

Andrew Clarke, Save the Children UK, London, United Kingdom

Louise-Tina Day, London School of Hygiene and Tropical Medicine, London, United Kingdom

Ashok Deorari, All-India Institute of Medical Sciences, New Delhi, India

Queen Dube, Blantyre College of Medicine, Blantyre, Malawi

Laura Ferguson, Kek School of Medicine, University of Southern California, Los Angeles (CA), USA

Tedbabe Hailegabriel, UNICEF, New York City (NY), USA

Lily Kak, US Agency for International Development, Washington DC, USA

Neena Khadka, Maternal and Child Survival Program, Washington DC, USA

Catherine Kirk, Partners In Health – Rwanda, Kigali, Rwanda

Marzia Lazzerini, Institute for Maternal and Child Health, Burlo Garofolo Scientific

Institute for Research, Hospitalization and Healthcare, Trieste, Italy

Jim Litch, EveryPreemie, Global Alliance to Prevent Prematurity and Stillbirth, Lynnwood (WA), USA

Silke Mader, European Foundation on the Care of Newborn Infants, Munich, Germany

Arti Maria, Postgraduate Institute of Medical Education and Research and Dr Ram Manohar Lohia Hospital, Delhi, India

Carolyn MacLennan, WHO consultant, Alice Springs, Australia

Socorro Mendoza, Kangaroo Mother Care Foundation, Manila, Philippines

Sarah Moxon, London School of Hygiene and Tropical Medicine, London, United Kingdom

Georgina Murphy, Bill & Melinda Gates Foundation, Seattle (WA), USA

Karen New, WHO consultant, Queensland, Australia

Assaye Nigussie, Bill & Melinda Gates Foundation, Seattle (WA), USA

Jesca Nsungwa-Sabiiti, Ministry of Health, Kampala, Uganda

Sue Prullage, Council of International Neonatal Nurses, Danville (VA), USA

Anu Sachdeva, All-India Institute of Medical Sciences, New Delhi, India

Emma Sacks, Johns Hopkins University, Baltimore (MD), USA

Isabella Sagoe-Moses, Ministry of Health, Accra, Ghana

Manuel Sanchez Luna, Head, Neonatal Unit
Madrid, Madrid, Spain

Theresa Shaver, US Agency for International
Development, Washington DC, USA

Nalini Singhal, American Academy of
Pediatrics, Calgary, Canada

Merran Thomson, National Essential Survival
Technology project, Chiesi Foundation,
Uxbridge, United Kingdom

Karen Walker, Council of International
Neonatal Nurses, Sydney, Australia

Steve Wall, Save the Children, Fairfield (CN),
USA

Charlotte Warren, Population Council,
London, United Kingdom

Bjorn Westrup, Department of Neonatology,
Karolinska University Hospital, Stockholm,
Sweden

Bogale Worku, Ethiopian Pediatrics Society,
Addis Ababa, Ethiopia

Nabila Zaka. UNICEF, New York City (NY),
USA



For more information, please contact:

Department of Maternal, Newborn, Child
and Adolescent Health and Ageing (MCA)
World Health Organization
Avenue Appia 20, 1211 Geneva 27
Switzerland

Telephone: +41 22 7913858
Email: mncan@who.int
Website: www.who.int

