MAMI

Management of small & nutritionally At-risk Infants under six months & their Mothers

MAMI Care Pathway Package

Contents

MAMI Care Pathway Package

Acknowledgements

The MAMI Care Pathway Package, v3 was developed in a collaborative effort of the MAMI Global Network (formerly the MAMI Special Interest Group), coordinated by the Emergency Nutrition Network (ENN) in close collaboration with the London School of Hygiene and Tropical Medicine (LSHTM), Save the Children and GOAL, and in consultation with experienced programmers and experts. We gratefully acknowledge the many individuals and agencies who actively contributed to this effort. All contributors are listed in Annex 1.

The development of the MAMI Care Pathway Package was funded through ENN by Irish Aid and the Eleanor Crook Foundation, with previous versions (C-MAMI Tools v2 and v1) funded by Irish Aid and Save the Children through ENN. The views of the funders have not influenced the content of the package.

MAMI
Management of small & nutritionally At-risk Infants under six months & their Mothers

www.ennonline.net/ourwork/research/mami

Irish Aid
Rialtas na hÉireann
Government of Ireland

Eleanor Crook Foundation

ENN

1 Scope and purpose

1.1. Objectives

MAMI refers to the management of small and nutritionally at risk infants under six months of age (infants u6m) and their mothers.

Health intent

This MAMI Care Pathway Package provides users with guidance and tools to:

- **Screen** all infants u6m and their mothers (or primary caregivers, referred to as mothers hereon in) to identify those who are small and nutritionally at risk and who therefore require targeted support.
- **Assess and diagnose** common feeding, health, and social issues in both infant and mother that may contribute to or cause the nutritional risk.
- **Manage and treat** common problems as identified in the previous step and support the mother-infant dyad in general.

Expected benefit

The MAMI vision is that:

'every small and nutritionally at risk infant u6m and their mother is supported to survive and thrive'. (1)

Specific benefits are expected to include:

- Reduced risk of death - **survive**. Compared to well-grown, well-nourished infants, our target population is otherwise at markedly increased risk of mortality (2-4).
- Mother and infant pair **thrive**, as defined by reduced risk of illness and poor health; reduced risk of malnutrition; improved development; and improved long-term health.

See section **1.2** on 'Outcomes' for details of how each of these might be measured and assessed.

Targets – who benefits?

The MAMI Care Pathway is targeted at moderate-risk and high-risk infants and thus focuses on secondary and some aspects of tertiary-level care. Prevention and primary care for all (low-risk) infants are dealt with separately through related but distinct programmes, such as Infant and Young Child Feeding (IYCF) support programmes.

Despite this targeted nature, we expect wider societal benefits as well as benefits to our target group of infants alone. We expect these benefits to occur: first, because of how common the issues are across a range of contexts; second due to the high-risk of mortality and morbidity in this group; and third, since the MAMI Care Pathway also engages with and supports mothers and the wider family.

1.2. Health questions covered

Target population

Our target population of **small and nutritionally at risk infants u6m** is defined using a variety of criteria that often differ according to setting and context. Currently, common criteria include infants:

- With **low weight-for-age** (5).
- Whose **weight is faltering** (i.e., not increasing in weight or dropping across centiles on a growth chart) (6).
- Who are born **low birthweight** (<2500g) that includes **premature infants or small-for-gestational age** (7, 8).
- With **low weight-for-length** e.g. <-3 z-scores (9).

Criteria with growing evidence but not yet in widespread use include:

- Low mid-upper-arm circumference (MUAC) (10-12).
- Addition of clinical or other criteria to supplement anthropometric criteria (e.g. multiple birth, not breastfed) (13).

Which criteria and/or combination of criteria best identify moderate-risk and high-risk infants is the subject of intense current research (14). In this guidance (**see MAMI User Guides**) we have suggested detailed enrolment criteria that most settings/programmes should find acceptable and effective. Users should however consult the latest international as well as national guidance and adapt to what is locally appropriate.

Interventions

The MAMI Care Pathway Package is an implementation guide that comprises of a framework, user guides and assessment and management tools. It applies an integrated care pathway approach to manage clinical issues, growth faltering, infant feeding problems and maternal health and wellbeing across different parts and levels of health services and systems. The

resources centre on case management delivered at primary level health services (outpatient and community services). However, the resources can also be used to support the delivery of care to clinically stable infants in inpatient settings. The MAMI Care Pathway:

- uses existing health system contact points to identify and enrol infants u6m.
- works with and strengthens existing health and nutrition services.
- bridges interventions across relevant disciplines.
- signposts and connects infant-mother pairs to relevant services through referral pathways.

It is important that users recognise the rationale for and the wider benefits of a care pathway approach, as outlined in **Box 1** (15):

BOX 1 Benefits of a Care Pathway approach

- **Improve multidisciplinary communication and care planning.**
- **Safeguard quality standards in care regardless of the context in which they are implemented.**
- **Limit unwanted practice variation.**
- **Aim to improve clinician-patient communication and patient satisfaction.**
- **Facilitate introduction of guidelines and systematic and continuing audit into clinical practice.**
- **Identify research and development questions.**

As with any care pathway, the MAMI Care Pathway Package requires refinement and adaptation in different settings to be as contextually relevant, appropriate, and effective as possible. Exactly how the MAMI Care Pathway is implemented in each context will depend on many factors including:

- **Existing services available:** these will determine referral pathways and ways in which services can best work together in synergy and maximise efficiencies.
- **Human resources:** numbers of staff at different levels of the healthcare system and their training/experience will determine who is best placed to 'deliver' the MAMI Care Pathway in practice in different settings.

Resources in the package need to be adapted to the context ideally in consultation with target users to explore and address feasibility (including demand, acceptability, practicality, implementation). Key information can be drawn from the resources or the resources may be integrated within existing materials used at national or sub-national level and by implementing agencies.

Core contents of the MAMI Care Pathway Package are based on and are intended to help operationalise World Health Organisation (WHO) Guidelines for the management of infants u6m with severe acute malnutrition (2013) (9). The overall approach and format of the MAMI Care Pathway Package is modelled on and supports the implementation of Integrated Management of Childhood Illness (IMCI) (16-18).

As with any care pathway, we expect the MAMI Care Pathway to fulfil multiple functions:

- Improve communication and planning of care such as between relevant services, policymakers and programmers.
- Directly guide patient care and safeguard standards.
- Improve healthcare worker/patient communication and patient satisfaction.
- Provide a basis for audit and research to improve the evidence-base for this topic.
- Help improve future service needs and design.

Outcomes

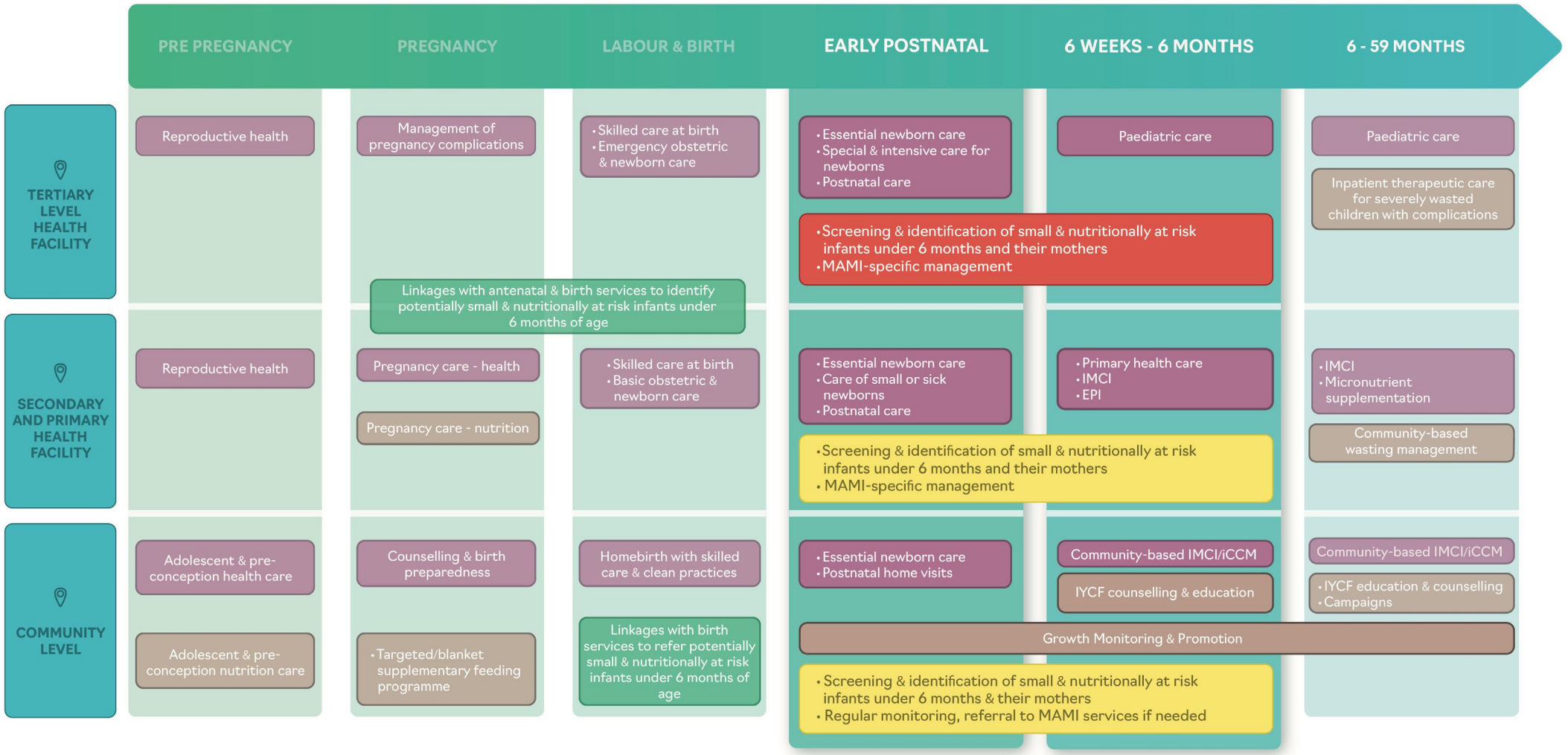
Measurable outcomes from the use of the MAMI Care Pathway are expected to include:

- **Reduced risk of mortality:** Early and proactive identification of high-risk and moderate-risk infants, including low birthweight infants, for targeted interventions coupled with monitoring to maintain surveillance and facilitate prompt access to services should result in reduced mortality risk (4, 7).
- **Reduced risk of illness and poor health:** For example, fewer episodes of illnesses such as diarrhoea; less severe illnesses if they do occur with reduced clinic and hospital visits.
- **Reduced risk of malnutrition:** Early and proactive treatment of nutrition-related issues in infants u6m should result in fewer infants needing referral for malnutrition treatment at older ages (i.e., reduced numbers with low weight-for-length and low MUAC at age 6 months and beyond) (19). Whilst growth (e.g., increased weight, length) and nutrition are closely related, they are not synonymous. Growth is an important marker of good nutrition but is not an end in itself. Fast growth and large body size does not always equate to healthy growth (20). Healthy growth associated with low-risk of mortality/morbidity is what matters (21).
- **Improved development:** This includes motor, fine motor, sensory and cognitive development that will benefit from active support from early childhood development and nurturing care (22). Development can be assessed by a variety of tools and by achieving key developmental milestones on time (23, 24).
- **Improved long-term health:** Good nutrition and healthy growth in the first 6 months of life have potential long-term benefits. Increasing evidence shows that early-life malnutrition is associated with conditions in adulthood such as cardiometabolic and other non-communicable diseases (25, 26).

Health care setting or context

The package is designed particularly for use in low- and middle-income countries and is applicable in both humanitarian and development settings. **Figure 1** outlines the key components of case management and how the pathway aligns and fits with existing services to facilitate a continuum of care for mother and infant through the lifecycle.

Figure 1 How the MAMI Care Pathway fits and links with existing services from pregnancy through to 6 months of age



NB: 6 weeks is a key age since this aligns with age of first DTP (diphtheria/tetanus/ pertussis) vaccine in most countries and is a key contact point to screen for and identify any early-infancy problems. Where this immunisation is done at a different age, the framework should be aligned accordingly.

1.3. Population

As noted in section **1.2**, details of how to define "small and nutritionally at risk infants u6m" vary in different settings and is a rapidly evolving area. Hence, latest evidence should always be sought when implementing this pathway.

Sex and age

Both male and female infants are considered as being potentially at risk (27). Criteria flagging nutritional risk may occur throughout infancy or at specific time-points during infancy. For example, infants may be:

- **Born small** e.g., low birthweight (<2500g) that includes small-for-gestational age and/or premature. This may predispose infant to subsequent problems (10).
- **Initially well at birth but develop problems in EARLY infancy (first 6 weeks to 2 months of life)** e.g., failure to establish breastfeeding due to maternal illness/death increases the risk of malnutrition in the first few weeks of life.
- **Initially well but develop problems in LATER infancy** e.g., Exclusive breastfeeding to the WHO recommended age of 6 months is uncommon in many settings. For example, introduction of water and other foods at 3 to 4 months and beyond may lead to diarrhoea and weight loss.

Recognising that elevated risk may remain despite anthropometric recovery, all mother-infant pairs are enrolled in the MAMI Care Pathway **until the infant reaches 6 months of age**. This has two key advantages:

1. There is a clear, consistent, easily determined endpoint. This makes it easy to compare different programmes in different settings.
2. For infants who remain small or nutritionally at risk despite support, there is a clear and direct referral pathway to other nutrition programmes. This includes but is not limited to community-based wasting management programmes (9, 19), which admit children with wasting from age 6 months upwards.

The mother-infant dyad

Assessment and support of the infant and mother pair is integral to case management. The health, nutrition, and wellbeing of one directly affects the other. Successful outcomes therefore depend on both the infant and mother being well-managed and well-supported. This is reflected in assessment and action regarding the nutritional, physical, and mental health of the mother in the MAMI Care Pathway.

Clinical conditions

There are many reasons why an infant may be small or nutritionally at risk. We have included common or important factors on the basis of prior literature and experience in this area. Details of how to identify or treat each condition were drawn from related guidance/guidelines and 'packaged' in this integrated MAMI Care Pathway.

2 Stakeholder involvement

2.1. Group membership

The MAMI Care Pathway Package was developed by a multi-disciplinary group from a wide range of different institutions in different countries (see Annex 1). This included:

- Practitioners and researchers
- International and national perspectives
- Humanitarian and development perspectives
- Experts from infant feeding, nutrition, paediatrics, neonatology, health, and maternal mental health.

No competing interests were identified.

2.2. Target population preferences and views

In developing this guidance, we have taken into account prior experiences and preferences expressed by both carers of infants u6m and healthcare staff who we expect to be using the guidance (28-31). These were explored in evaluations of previous versions of the guidance (then called the "C-MAMI Tool") (32).

Key areas highlighted in previous evaluations that we incorporated into the MAMI Care Pathway Package include:

- The need for community-focused models of care.
- The need for a simple and user-friendly format and approach, hence the focus on checklists and 'how-to' user guides that align with IMCI. These are familiar and widely used for other child health conditions.

We expect that this current version will undergo similar future evaluations, incorporating user and target population feedback.

2.3. Target users

This package is primarily intended for use by nutrition and health service providers working at the sub-national, national, and international levels across a range of organisations including Ministries of Health, the United Nations, and non-governmental organisations to guide high-quality context-specific, connected service provision. Additionally, it will be useful for global and national policymakers and researchers to facilitate policy decisions and research.

3 Development

3.1. Underlying evidence: selection criteria & search methods

The MAMI Care Pathway Package builds on a broad range and variety of accumulated evidence and experience rather than a stand-alone evidence review carried out specifically to inform this work. It consolidates learnings from an original version developed in 2015 as a first step to fill a gap in programming guidance and catalyse case management (33). Version 2.0 was produced in 2018 (34). This current, third review process was initiated in 2020 and is informed by: operational research that includes service user experiences (28); programme evaluations (32, 35); systematic and other literature reviews (2, 36-38); and collated practitioner experiences (29-31, 39).

3.2. Link between recommendations and evidence: strengths & limitations

A major limitation of the MAMI Care Pathway is that the direct evidence-base is sparse and low quality, with few current randomised trials to robustly inform guidance. Most literature focuses on older age groups or on all infants u6m, not just those that are small and nutritionally at risk. While it is plausible that interventions that work or do not work for this wider group correspondingly work or do not work in the subset of small and nutritionally at risk infants u6m, this is not certain. Research directly targeting just small and nutritionally at risk infants u6m is urgently needed. Many questions flagged in a 2015 research prioritisation exercise remain unanswered or insufficiently answered (40).

3.3. Formulation of recommendations & external review

Due to the weak underlying evidence-base, consensus among experts was used to develop initial and final versions of the MAMI Care Pathway Package. Wider stakeholders were consulted during regular remote meetings over the course of a year (January 2020 to March 2021) and subgroups were set up to focus on specific sections, notably the maternal mental health section.

The core committee (see **Annex 1**) decided on the final version of the MAMI Care Pathway Package. The ENN coordinated and managed the update process and produced the final version.

3.4. Benefits and harms (and scope of guidance)

Recognising the weak direct evidence base for the MAMI Care Pathway Package, it takes a deliberately cautious approach. Suggested interventions are fundamentally behavioural in nature and hence very low-risk – but with high potential for benefits.

Related to balance of benefit and harms, we acknowledge that there is scope for additional antimicrobial and micronutrient interventions for our target patient group (38). These would however alter the benefit/harm balance and we have therefore deliberately not focused on them because: the evidence base is also very weak; they would introduce risks of side-effects and adverse effects; they would increase the costs and logistical challenges of MAMI care. We urge all to refer to the latest global (WHO) guidance on this issue when implementing MAMI care packages since this is a fast-evolving field.

3.5. Updates

The package will be updated periodically based on available evidence. We expect:

- Minor updates led by users who are adapting the package to their local settings. Users will be asked for contact details and permission to follow-up in exchange for editable versions of the pathway to help track and learn from such modifications.
- A major review in approximately 5 years when we anticipate that new evidence will be available, including from a randomised controlled trial of the MAMI Care Pathway Package in Ethiopia (see **Box 2**).

BOX 2 Building evidence and shared learning

The area of MAMI is a developing field of practice that requires a stronger evidence base. Between 2019 and 2024 the MAMI Care Pathway is being tested in a programme of research that includes a randomised control trial and process evaluation in Ethiopia in a partnership led by LSHTM, with Jimma University, GOAL, and ENN and funded by the Eleanor Crook Foundation. Additional operational testing in a range of contexts is required and encouraged.

There remains a continuing need to advocate for case management of small and nutritionally at risk infants u6m and their mothers and to capture and share data and experiences in their management. Implementation experiences will inform future updates. The MAMI Care Pathway Package is an open-source material that we encourage all to use and adapt as needed for the given context.

Please contact the MAMI Global Network for editable versions of the MAMI Care Pathway Package, with feedback and experiences of using the package, and if you are interested in or planning field testing: mami@ennonline.net

3.6. Applicability

The applicability of the guidance has been considered during the development process, through the inclusion of feedback from key stakeholders experienced in implementing Version 2. This has resulted in practice-focused and clear User Guides and Health Worker Support Materials (Assessment Forms, Counselling Cards and Support Actions Booklet) in the MAMI Care Pathway Package. Resource implications have been considered, although implementers are encouraged to explore feasibility and research and document resource implications and costs of applying the MAMI Care Pathway Package in a variety of settings.

4 Orientation to the MAMI Care Pathway Package

4.1. Content summary

The MAMI Care Pathway Package has three sections:

1. Overview
2. User Guides
3. Health Worker Support Materials

The resources and their uses are summarised in Table 1.

Table 1 Summary of the MAMI Care Pathway Package Contents

MAMI Care Pathway resource	Details	Intended use
1. Overview	A walk through the MAMI Care Pathway Figure 2: MAMI Care Pathway: Overview Figure 3: MAMI Care Pathway: Who, What, Where	The key steps that each mother-infant pair will take through the MAMI pathway of care are described. Figure 2 outlines the flow of mother-infant pairs through the MAMI Care Pathway. Figure 3 details the steps of screening, assessment, management, and exit. It indicates what happens at each stage, who is involved, and where it takes place. This should be used as a starting point for context-specific adaptations. Blank versions of both figures are provided in Annexes 2a and 2b to facilitate context specific discussion, planning and adaptations.
2. User Guides	MAMI Rapid Screening Guide MAMI Assessment Guide MAMI Feeding Assessment Guide MAMI Maternal Mental Health Assessment Guide MAMI Outpatient Care: Management Guide MAMI Outpatient Care: Maternal Mental Health Support Summary	User guides provide a summary of the flow of the screening, assessment and management processes in the MAMI Care Pathway. They can be used in training or as reference materials once adapted to the context. The MAMI Outpatient Care: Management Guide describes the general and tailored care provided according to level of risk. The MAMI Outpatient Care: Maternal Mental Health Support Summary outlines potential mental health interventions to help plan MAMI services and linkages.
3. Health Worker Support Materials	MAMI Assessment Form MAMI Feeding Assessment Form MAMI Maternal Mental Health Assessment Form MAMI Enrolment and Follow Up Form *Supplementary Material:* ***MAMI Counselling Cards and Support Action Booklet*** ***Health Workers Support Materials User Booklet***	Forms are provided for health workers to record and monitor key information to support care. The MAMI Assessment Form is the main form used during the assessment process. The MAMI Feeding Assessment Form and the Maternal Mental Health Form should be used where specific issues are identified. The MAMI Enrolment and Follow Up Form records weekly progress, specific counselling and support provided, and should prompt review of visit frequency. Once the infant reaches 6 months of age, the form guides the final 6 month of age outcome review and referral. The MAMI Counselling Cards and Support Actions Booklet provide practical tools health workers to counsel and support the mother/primary caregiver. These materials may be used directly/adapted/combined or key elements integrated into existing resources (see Health Workers Support Materials User Booklet for more information).

4.2. A walk through the MAMI Care Pathway

The key steps that each mother-infant pair will take through the MAMI pathway of care are:
Step 1: MAMI Rapid Screening
Step 2: MAMI Assessment
Step 3: MAMI Support and Management
Step 4: Outcome review at 6 months of age
Step 5: Referral to continued care for infants or mothers still at risk.

Each step is accompanied by a user guide, relevant forms, and health worker support materials as outlined in **Figure 2**.

Figure 3 outlines **what** actions are required at each step, **where** they may take place, and **who** might implement them. It includes which User Guides and Forms should be referenced at each step. The figure's purpose is only to guide implementation of the MAMI Care Pathway Package and context specific adaptations. It should not be considered as the only way it could be implemented in any given context. Where possible, these MAMI-specific steps should be integrated into existing health system activities at the community, primary, secondary, and tertiary levels (e.g., MAMI guidance fit with IMCI guidelines for other common conditions of infancy).

Step 1: MAMI Rapid Screening

At every community or health service contact point, each mother infant-pair undergoes a rapid screening assessment. This could be in the community, at an outpatient clinic, or in a hospital setting. Consider using vaccination clinics, growth monitoring clinics, under 5 clinics for minor illnesses.

All screenings must begin with IMCI-based triage and action to ensure that any infant with life-threatening danger signs is immediately identified and urgently referred to appropriate inpatient care as rapidly as possible (see **Figure 2**).

Those without danger signs undergo MAMI-specific screening to assess MAMI-related risk factors in the infant and mother. This is a simple and minimal level of assessment so that it can fit with and be added to whatever other service the mother-infant pair have come to access, e.g., when an infant comes for routine vaccination or if an infant presents with diarrhoea or fever, they should also receive a MAMI Rapid Screening.

Any mother-infant pair with an identified MAMI related-risk is referred for a full MAMI Assessment at the nearest health facility. Low risk mother-infant pairs should continue with routine healthcare and IYCF counselling.

Step 2: MAMI Assessment

All mother-infant pairs referred for a MAMI Assessment receive a more thorough assessment to identify specific issues to inform the type and level of care needed. Where an infant has been referred from community-based screening, IMCI-based triage and action is repeated in case an infant has deteriorated since.

Assessment can take place wherever there are suitably qualified/trained staff. Since it is important to identify sometimes subtle or uncommon underlying issues/problems, this needs a higher level of skills and expertise so is likely to be at an outpatient clinic or hospital in most settings.

Based on assessment findings, mother-infant pairs are classified into one of three risk groups using a traffic light system:

- **High-risk** pairs are referred to MAMI Hospital Care at the nearest facility offering inpatient care for infants u6m.
- **Moderate-risk** pairs are referred to MAMI Outpatient Care for enrolment to 6 months of age.
- **Low-risk** pairs are referred to routine healthcare and IYCF counselling.

Step 3: Support & Management

Details of this step depend on an infant's risk classification as defined in Step 2.

a) **MAMI Hospital Care:** Mother-infant pairs enrolled in inpatient care will receive medical treatment for clinical conditions as per relevant guidelines and protocols. Once an infant is clinically stable, the MAMI Care Pathway Package can be used while admitted to provide tailored counselling and support, such as on infant feeding and maternal mental health. Once an infant is clinically stable, they are eligible for discharge to MAMI Outpatient Care where this support should continue. If an infant reaches 6 months of age while in hospital, conduct Step 4 (6 Month of Age Outcome Review) from the inpatient facility.

b) **MAMI Outpatient Care:** Mother-infant pairs enrolled in MAMI Outpatient Care will receive care through regular visits (e.g., weekly/fortnightly) until the infant reaches 6 months of age. Care comprises of core counselling sessions and, if required, tailored counselling and support to address key MAMI risk factors, infant feeding and maternal mental health. Health workers record and monitor the pair's progress. If the condition of mother or infant deteriorates while in MAMI Outpatient Care, they should be referred to hospital care as appropriate. See the **MAMI Outpatient Care: Management Guide** for details.

c) **Routine healthcare and IYCF counselling:** Any mother-infant pair identified as 'low-risk' will be referred to existing routine healthcare and IYCF counselling services to receive care according to national programmes and guidelines. If the condition of mother or infant deteriorates while receiving routine services as identified through regular MAMI Rapid Screening, the pair will be re-referred for MAMI Assessment (Step 2).

Referral: The MAMI Care Pathway is an opportunity to link with other relevant health and social support services, for example:

- Vaccinations
- Social welfare
- Specialised maternal mental health support
- Disability services
- Community support groups
- Food security services (e.g., supplementary feeding for the mother)
- Wasting treatment services (for older children)

Some of these services may be a priority for an individual mother-infant pair and hence integral to their MAMI care (e.g., mental health issues identified in the MAMI assessment may warrant referral to more specialist support services); other services are routine, and it is good practice to ensure that mothers are accessing them (e.g., a MAMI monitoring visit may double check that vaccinations have been given according to schedule).

Referrals may be done while enrolled in MAMI Outpatient Care and/or on exit (see **Step 5**) as best fits local and individual circumstances.

Monitoring: Routine regular monitoring of the mother-infant pair when they are receiving services will determine whether they are progressing well. Growth is an important sign but not the only sign that underlying problems are being dealt with. If a mother-infant pair are:

- Showing sufficient improvement → then the frequency of their engagement with services should be reduced (e.g., visits from every week to every two weeks; from every two weeks to every month).
- Not progressing and/or deteriorating → then frequency of visits should be increased (e.g., from monthly to weekly). Alternatively, the pair may require referral to inpatient care.

Other outcomes to note as part of support and management include:

- **Absent:** Mother-infant pair missed scheduled visit.
- **Default:** Any pair that is absent for two consecutive visits without obvious reason should be followed up and encouraged to return. If after at least two attempts to call or visit the home and no information is available on what has happened to the infant, the pair is said to have defaulted.
- **Died:** The date and documented (or presumed) cause of death should be noted for the death of the mother or infant.
- **Transfer out:** If a mother-infant pair wish to receive care through a different MAMI service point, they may be transferred (for example, to another health facility with embedded MAMI support in a neighbouring district).
  Mother-infant pairs continue in the MAMI Care Pathway until the infant reaches 6 months of age regardless of status.

Step 4: 6 Month of Age Outcome Review

When the infant reaches 6 months of age (or as soon as possible after that age), the health worker conducts a review to determine the mother-infant pair's status and if they require continued support upon exit from MAMI care. Potential outcomes at this stage are:

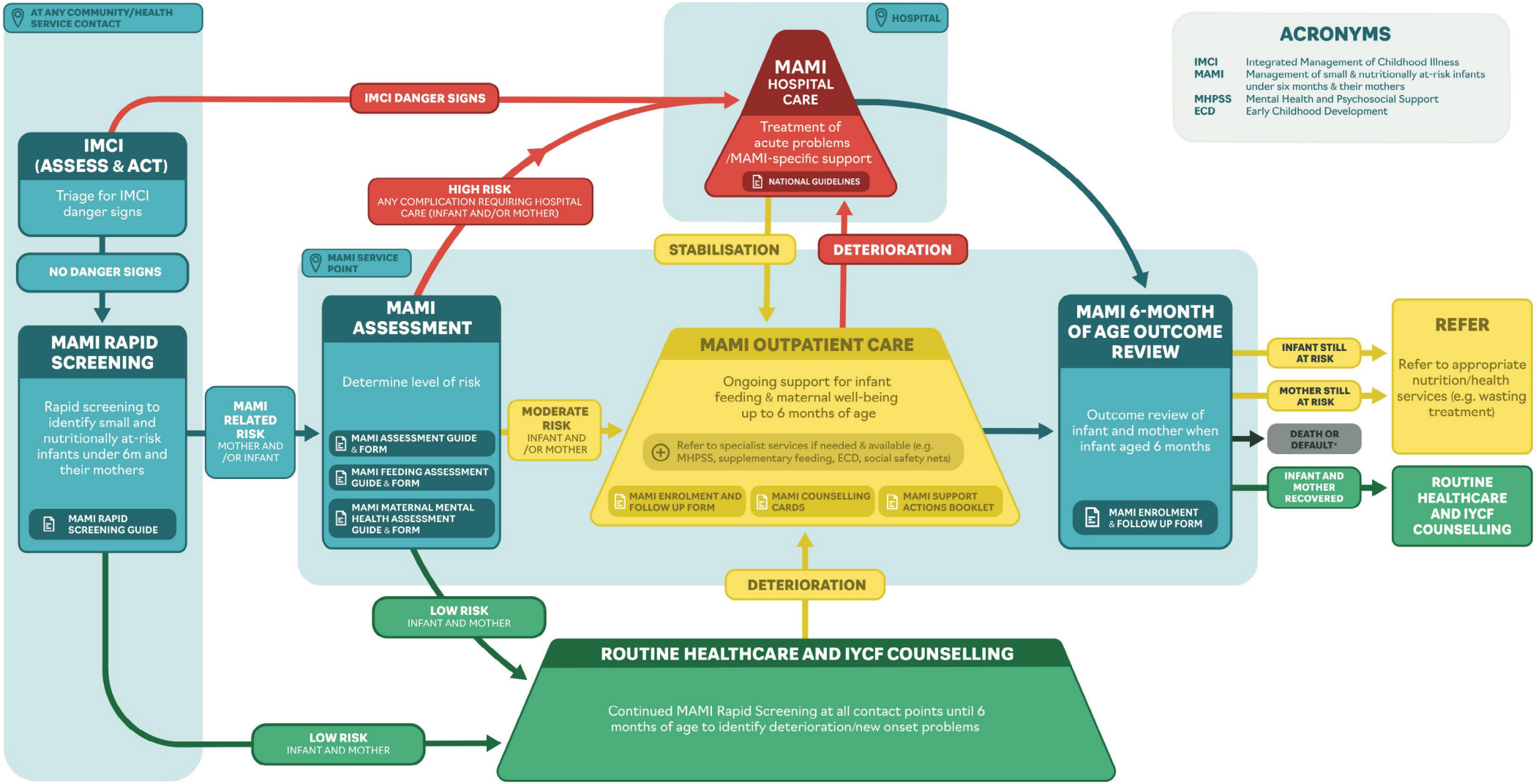
- **Recovered (infant and mother):** No further support needed (can be referred to routine healthcare and IYCF counselling).
- **Ongoing or new issue needing support (infant or mother still at risk):** Mothers and infants with ongoing or new issues detected during the outcome review should be referred for further support. For example, a mother might be referred to mental health support services, social or food support services. An infant might be referred to wasting treatment services if they meet admission criteria.

Some suggested programme outcome and monitoring indicators may include:

- Default (less than 15%)
- Wasted at 6 months of age (%)
- No indication for ongoing care (%)
- Death (%)

A working group within the MAMI Global Network has been formed to determine appropriate indicators.

Figure 2 MAMI Care Pathway flow diagram



*Death or default may occur at any point in the pathway and requires further investigation.

Figure 3 MAMI Care Pathway: Who, What, Where

SCREENING

WHAT?

Screen and refer for assessment using:

- IMCI and MAMI-specific danger signs checks
- Infant growth
- Infant feeding
- Maternal health and wellbeing

WHERE?

- Home visits
- Community (e.g. EPH/vaccination visits
- Outpatient clinic (e.g. IMCI)
- Hospital (e.g. neonatal units at discharge)

WHO?

- Community health workers
- Outpatient clinic staff (e.g. vaccine providers, growth monitors, midwives, U5 clinic staff)
- Hospital-based staff e.g. neonatal care staff

GUIDES & FORMS

MAMI Rapid Screening Guide

ASSESSMENT

WHAT?

- IMCI and MAMI-specific clinical assessment
- Infant growth
- Infant feeding
- Maternal health and wellbeing

WHERE?

Hospital, if clinical complication	Outpatient clinic, if no clinical complications

WHO?

- Outpatient clinic staff (e.g. nurse)
- Hospital-based staff (e.g. neonatal care staff, paediatricians)

GUIDES & FORMS

- MAMI Assessment Guide & Form
- MAMI Feeding Assessment Guide & Form
- MAMI Maternal Mental Health Assessment Guide & Form
- MAMI Enrolment & Follow Up Form

SUPPORT AND MANAGEMENT

MAMI INPATIENT CARE

WHAT?

1. Clinical care to achieve clinical stabilisation.
2. Provide treatment for congenital conditions affecting feeding (e.g. tongue tie), feeding support, and maternal mental health support.
3. If child reaches 6 months of age in inpatient care, conduct 6 month of age outcome review from inpatient facility.

WHERE?

Hospital

WHO?

Hospital-based staff (e.g. doctors, nurses, feeding counsellors)

GUIDES & FORMS

Refer to existing national guidance on inpatient treatment of infants under six months with wasting and clinical complications

MAMI OUTPATIENT CARE

WHAT?

1. Counselling on **core topics** for all enrolled pairs.
2. Tailored counselling and actions to address **specific risk factors and problems** as required:
   - Clinical care
   - Feeding counselling & support
   - Mental Health and Psychosocial Support (MHPSS) for mothers
3. Monitoring of progress of mother infant pairs and adjust follow up frequency as appropriate.

WHO?

- Clinical care: Outpatient clinic staff
- Tailored feeding counselling support: IYCF counsellors
- MHPSS for mothers: IYCF counsellors and/or MHPSS staff
- Monitoring of progress: Outpatient clinic staff or IYCF counsellors

WHERE?

Outpatient clinic

REFERRAL TO OTHER AVAILABLE SUPPORT SERVICES AS NEEDED, E.G.

- Specialised MHPSS services
- Targeted supplementary feeding programme for pregnant and lactating women
- Vaccinations
- Social safety net scheme

GUIDES & FORMS

- MAMI Enrolment & Follow Up Form
- MAMI Counselling Cards & Support Actions Booklet

6-MONTH OF AGE OUTCOME REVIEW

WHAT?

Assessment at 6 months of age.

- IMCI and MAMI-specific clinical assessment
- Infant growth
- Infant feeding
- Maternal health and wellbeing

Referral to support services for continued care if required.

WHERE?

Outpatient clinic

WHO?

- Outpatient clinic staff

CONTINUUM OF CARE

- Infant malnutrition → wasting treatment
- Feeding problems → IYCF
- Clinical issues → IMCI

GUIDES & FORMS

MAMI Enrolment & Follow Up Form

ACRONYMS **IYCF –** Infant and Young Child Feeding **MHPSS –** Mental Health and Psychosocial Support **IMCI –** Integrated Management of Childhood Illnesses

5 User Guides

The User Guides provide a summary of the flow of the screening, assessment, and management processes in the MAMI Care Pathway. They can be used in training or as reference materials once adapted to the context. The User Guides are as follows:

- **MAMI Rapid Screening Guide**
- **MAMI Assessment Guide**
- **MAMI Feeding Assessment Guide**
- **MAMI Maternal Mental Health Assessment Guide**
- **MAMI Outpatient Care: Management Guide**
- **MAMI Outpatient Care: Maternal Mental Health Support Summary**

MAMI Rapid Screening Guide

NOTES:
1. Refer to MAMI Counselling Cards and Support Actions Booklet.
2. If there is documented weight loss or failure to gain adequate weight (less than 5g/kg/day) or if mother reports that infant has lost weight or failed to gain weight, then refer for MAMI Assessment.
3. This refers to any mode of feeding: breastfed, non-breastfed, or mixed feeding.
4. In contexts with high case loads and/or limited capacity, it may be necessary to limit screening to the core criteria (Step 1: IMCI danger signs + Step 2: infant anthropometry). This will limit MAMI enrolment to infants with an existing anthropometric deficit who require immediate support. If capacity allows, screen for expanded criteria (Step 3: infant feeding issues + Step 4: maternal health and wellbeing) in addition to the core criteria. The expanded screening criteria aim to identify infants and mothers with risk but no current anthropometric deficit and prevent them from developing growth failure.

ASSESS

CORE SCREENING CRITERIA[4]

1. IMCI DANGER SIGNS

CHECK FOR:

GENERAL DANGER SIGNS

- Unable to drink or breastfeed or vomits everything
- Convulsions
- Difficulty breathing
- Temperature (high or low)
- Lethargic or unconscious
- Refer to IMCI for details on danger signs

MAMI-SPECIFIC DANGER SIGNS

Bilateral oedema (+, ++, or +++)

2. INFANT GROWTH

ASK:

- Was infant born too early (preterm) or too small (low birthweight)? (reported or documented)
- Has infant recently lost weight or failed to gain weight, including neonate who has not regained birthweight? (reported or documented)

MEASURE:

WAZ and/or MUAC

EXPANDED SCREENING CRITERIA

3. INFANT FEEDING

ASK:

- Does infant have difficulties feeding?[3]
- Does infant usually receive any foods or drinks other than breastmilk?
- Does mother have feeding concern(s) or breast problem(s)? (reported or observed)

4. MATERNAL HEALTH AND WELLBEING

ASK AND LOOK:

- Does mother have illness that requires further assessment? (reported or observed)
- Has mother had any difficulties taking care of her infant or herself recently?

MEASURE:

MUAC

CLASSIFY
ALL MOTHERS AND INFANTS

SIGNS	CLASSIFY	ACT
ANY ONE OR MORE OF THE FOLLOWING SIGNS: • Not able to feed at all • Convulsions • Severe chest indrawing • Fast breathing • High or low body temperature • Movement only when stimulated or no movement at all • Bilateral oedema (+, ++, or +++)	**VERY SEVERE DISEASE**	Provide pre-referral treatment according to IMCI Refer **URGENTLY** to hospital (treatment of acute problem(s) plus MAMI-specific support)[1] or If referral is **REFUSED** or **NOT FEASIBLE:** treat at nearest health facility until referral is feasible
ANY ONE OR MORE OF THE FOLLOWING SIGNS: • Infant born preterm • Low birthweight • Recent weight loss or failure to gain weight[2] • Neonate has not regained birthweight by two weeks of age • MUAC less than 115 mm • WAZ less than -2 **ANY ONE OR MORE OF THE FOLLOWING SIGNS:** • Infant has difficulties feeding • Infant usually receives foods or drinks other than breastmilk • Mother has feeding concern or breast problem **ANY ONE OR MORE OF THE FOLLOWING SIGNS:** • Mother has illness requiring further assessment • Mother indicates she has had difficulties taking care of her infant or herself recently • Mother has MUAC less than 230mm	**POTENTIAL RISK**	Refer mother and infant to nearest MAMI service point for further assessment
• No signs of severe disease or potential MAMI-related risk	**LOW RISK**	Praise & reassure Provide or refer for routine health care & maternal and IYCF counselling

MAMI Assessment Guide

ASSESS

1. DANGER SIGNS

CHECK FOR:

GENERAL DANGER SIGNS:
- Unable to breastfeed / drink
- Vomits everything

Refer to IMCI for details on danger signs

MAMI-SPECIFIC DANGER SIGNS:
- Bilateral pitting oedema (+, ++, +++)
- Mother appears out of touch with reality or at risk of harming herself or infant; visible physical neglect (mother or infant)

2. CLINICAL SIGNS AND SYMPTOMS

IMCI MAIN SYMPTOMS:

ASK:
- Diarrhoea?
- Fever?
- Cough?
- Any other problem?

LOOK:
- Severe pallor (anaemia)
- Any other illness (refer to IMCI)

CHECK for congenital condition/disability causing feeding difficulty:
- Breathlessness or excessive sweating when feeding
- Coughing and eye tearing while feeding (signs of unsafe swallowing)
- Abnormal tone or posture
- Cleft lip or palate
- Tongue tie
- Other

3. INFANT GROWTH

MEASURE:
- WAZ or WLZ
- MUAC

ASK:
- Has infant recently lost weight or failed to gain adequate weight, including neonate who has not regained birthweight? (reported or documented)

4. KEY MAMI RISK FACTORS

ASK:
- Is biological mother absent or dead?
- Was infant born too early (preterm) or too small (low birthweight)?
- Is infant from multiple birth?
- Is mother an adolescent (under 19 years of age)?
- If mother HIV+: any concerns?
- Does infant cry excessively or have sleep problems?
- Any other concerns (e.g. maternal TB, other illness, colic)?

MEASURE:
- Mother MUAC

5. SCREENING: INFANT FEEDING RISK

ASK:
- Are you the infant's biological mother? If not: what is the reason?
- Is the infant breastfed?
- If infant is breastfed: What other foods or drinks does the infant receive?
- Any problems feeding your infant?

6. SCREENING: MATERNAL MENTAL HEALTH

ASK[6]:

Over the last two weeks, how often have you been bothered by the following problems:
- Little interest or pleasure in doing things?
- Feeling down, depressed, or hopeless?

Calculate screening score

CHECK:
- Health worker concerned about mother's mental health

CLASSIFY

ALL MOTHERS AND INFANTS

SIGNS	CLASSIFY	ACT
ANY ONE OR MORE OF THE FOLLOWING SIGNS: • Not able to feed at all **or** • Convulsions **or** • Severe chest indrawing **or** • Fast breathing or • High or low body temperature **or** • Movement only when stimulated or no movement at all **or** • Bilateral oedema (+, ++, or +++)	**VERY SEVERE DISEASE (INFANT)**	**Provide pre-referral treatment according to IMCI** **Refer URGENTLY to hospital** (treatment of acute problem(s) plus MAMI-specific support)[1] **OR** **If referral is REFUSED or NOT FEASIBLE**, treat at nearest health facility until referral is feasible
• Mother appears out of touch with reality or at risk of harming herself or infant; visible physical neglect (mother or infant)	**SEVERE MENTAL HEALTH CONCERN (MOTHER)**	**Refer URGENTLY to specialised MHPSS services**
IMCI MAIN SYMPTOM(S) REQUIRING HOSPITAL REFERRAL OR **ANY CONGENITAL CONDITION/DISABILITY CAUSING FEEDING DIFFICULTY[2]**	**HIGH RISK (INFANT)**	**IMCI MAIN SYMPTOM(S)** → Hospital referral **Congenital condition/disability** → Hospital referral[3]
ANY ONE OR MORE OF THE FOLLOWING SIGNS: • Infants under 6 weeks: MUAC less than 110 mm • Infants 6 weeks to less than 6 months: MUAC less than 115 mm **or** • WAZ less than - 2 **or** • WLZ less than - 2 **or** • Recent weight loss or failure to gain weight[4] **or** • Neonate has not regained birthweight by two weeks of age **AND CLINICALLY STABLE, ACTIVE & ALERT**	**MODERATE RISK (INFANT)**	Manage any minor illness according to IMCI Enrol in MAMI Outpatient Care
ANY ONE OR MORE OF THE FOLLOWING SIGNS: • Mother absent or dead **or** • Infant born preterm **or** • Low birthweight **or** • Multiple birth[5] **or** • Adolescent mother (under 19 years)[5] **or** • Mother HIV+ with concerns or • Infant cries excessively / has sleep problems **or** • Mother MUAC less than 230mm[5] **or** • Any other concerns	**MODERATE RISK (INFANT AND/OR MOTHER)**	Enrol in MAMI Outpatient Care
INFANT FEEDING SCREENING: **ANY ONE OR MORE OF THE FOLLOWING SIGNS:** • Mother absent or dead **or** • Infant not breastfed **or** • Infant receives other foods or drinks **or** • Problems feeding infant	–	Conduct FEEDING ASSESSMENT to determine level of risk
MATERNAL MENTAL HEALTH SCREENING: • Screening score 3+ **or** • Health worker concerned about mother's mental health	–	Conduct MATERNAL MENTAL HEALTH ASSESSMENT to determine level of risk
• **Infants under 6 weeks:** MUAC greater than or equal to 110 mm • **Infants 6 weeks to less than 6 months:** MUAC greater than or equal to 115 mm **and** • WAZ greater than or equal to -2 **and** • Infant gaining adequate weight **AND CLINICALLY WELL & ALERT AND NO OTHER RISK FACTORS FOR INFANT AND MOTHER**	**LOW RISK (INFANT AND MOTHER)**	Praise & reassure Refer to routine healthcare & IYCF counselling

Notes

1. Refer to MAMI Counselling Cards and Support Actions Booklet.
2. Cleft lip/palate and tongue tie may not require hospital referral depending on severity, age of infant, and service availability. Referral to community-based specialist may be sufficient.
3. If a child has a congenital condition/disability but normal anthropometry, then non-urgent hospital referral is appropriate.
4. Failure to gain adequate weight is defined as weight gain less than 5g/kg/day or failure to gain weight as reported by the mother.
5. The decision to enrol infants from multiple births or from adolescent mothers or mothers with MUAC less than 230mm based on these criteria alone will depend on case load and context.
6. The MAMI Maternal Mental Health Screening uses the Patient Health Questionnaure-2 (PHQ-2) which screens for depression. Information on calculating the score is provided in the MAMI Maternal Mental Health Summary

MAMI Feeding Assessment Guide

ASSESS	SIGNS	CLASSIFY	ACT
1. ESTABLISH MODE OF INFANT FEEDING **ASK** • What and how do you feed the infant?[1]	**INFANT BREASTFED OR GIVEN BREAST MILK:** **ANY ONE OR MORE OF THE FOLLOWING:** • Fewer than 8 breastfeeds/breast milk feeds in 24 hours **or** • Not well-attached **or** • Not suckling effectively **or** • Infant receives foods or drinks other than breastmilk **INFANT NOT BREASTFED OR DOES NOT RECEIVE BREAST MILK:** **ANY ONE OR MORE OF THE FOLLOWING:** • Infant receives inappropriate formula **or** • Unsafe water used to prepare formula **or** • Formula incorrectly prepared **or** • Feeding bottle used **or** • Infant receives insufficient formula for age[4] **MOTHER:** **ANY ONE OR MORE OF THE FOLLOWING:** • Any breast condition (e.g. mastitis, thrush, pain) • Mother reports difficulty feeding infant	**MODERATE FEEDING RISK**	Enrol in MAMI Outpatient Care
2. INFANT BREASTFED OR GIVEN BREASTMILK **ASK:** • Please tell me about any difficulties with breastfeeding • How many times is the infant breastfed or given breastmilk in 24 hours?			
3. BREASTFEEDING OBSERVATION **OBSERVE BREASTFEED FOR AT LEAST 4 MINUTES[2]:** • Infant well-attached to breast? • Infant suckling effectively? **BREAST EXAMINATION:** • Any breast conditions (e.g., mastitis, thrush, pain)?			
4. CHECK IF INFANT RECEIVES ANYTHING OTHER THAN BREASTMILK **ASK:** • What other foods or drinks does the infant receive? Potential feeding risk if infant receives formula; Continue to Step 5	**INFANT BREASTFED OR GIVEN BREAST MILK:** • 8 or more breastfeeds/breast milk feeds in 24 hours and • Well attached **and** • Suckling effectively **and** • Infant receives only breastmilk **INFANT NOT BREASTFED OR DOES NOT RECEIVE BREAST MILK:** • Infant receives appropriate formula **and** • Safe water (e.g. boiled) used to prepare formula **and** • Formula correctly prepared **and** • No feeding bottle used **and** • Infant receives sufficient formula for age[4] **MOTHER:** • No breast conditions **and** • Mother reports no difficulty feeding infant	**LOW FEEDING RISK**	Praise & reassure Provide or refer for routine health care & maternal and IYCF counselling
5. INFANT RECEIVES FORMULA **ASK:** • What type of formula does the infant receive? • If using powdered formula: What source of water is used? • How is infant formula prepared? (e.g. number of scoops of powder per volume of water) • Is formula fed with a feeding bottle? • How much formula does the infant consume at each feed (liquid)?[3] • Please tell me about any difficulties with feeding			

CLASSIFY
ALL MOTHERS AND INFANTS

Notes
1. If infant receives any amount of breastmilk, then they should be considered a breastfed infant.
2. Observe breastfeeding for at least 4 minutes from when the infant is properly attached. If the infant has fed within the past hour, then you may need to return to the breastfeeding observation after completing other steps in the MAMI Assessment to check if the infant is willing to feed again.
3. It may be difficult for mothers to describe the volume of formula that the infant consumes at each feed. Alternatively, it may be helpful to ask how much formula is usually prepared and how much the infant usually leaves in the cup or bottle at the end of a feed. The mother should also specify the amount of powdered infant formula and the amount of water that are used to prepare a feed (usually one scoop of powdered infant formula should be added to every 30ml of water to achieve adequate nutrient density).
4. For guidance on sufficient quantities of infant formula for age, see the table on the MAMI Feeding Assessment Form.

MAMI Maternal Mental Health Assessment Guide

ASSESS

ASK[1]:

Over the last two weeks, how often have you been bothered by the following problems?

1. Little interest or pleasure in doing things?
2. Feeling down, depressed or hopeless?
3. Trouble falling or staying asleep? or Sleeping too much?
4. Feeling tired or having little energy?
5. Poor appetite? or Over-eating?
6. Feeling bad about yourself? Or that you are a failure? Or have let yourself or your family down?
7. Trouble concentrating on things, such as following a conversation with people?
8. Moving or speaking so slowly that other people could have noticed? Or being so fidgety or restless that you have been moving around a lot more than usual?
9. Thought that you would be better off dead or of hurting yourself in some way?

NOTE MOTHER'S RESPONSES ON THE MAMI MATERNAL MENTAL HEALTH ASSESSMENT FORM AND CALCULATE TOTAL ASSESSMENT SCORE

CLASSIFY
ALL MOTHERS AND INFANTS

SIGNS	CLASSIFY	ACT
ANY ONE OR MORE OF THE FOLLOWING: • Score of 15 or higher **and/or** • 'Yes' to question 9 (thoughts of self harm)	**HIGH RISK:** URGENT MATERNAL MENTAL HEALTH CONCERN	Urgent consult with MHPSS specialised care (if accessible)* **AND** Enrol in MAMI Outpatient Care
ALL OF THE FOLLOWING SIGNS: • Score 10 – 14 **and** • 'No' to Question 9 (thoughts of self-harm)	**MODERATE RISK** Mother would benefit from mental health and psychosocial support	Enrol in MAMI Outpatient Care
ALL OF THE FOLLOWING SIGNS: • Score 9 or less **and** • 'No' to Question 9 (thoughts of self-harm)	**LOW RISK** No follow-up for maternal mental health required at this time	Praise & reassure Provide or refer for routine health care & maternal and IYCF counselling

Notes
1. The MAMI Maternal Mental Health Assessment uses the 'Patient Health Questionnaire-9' (PHQ-9). The PHQ-9 is designed to screen, diagnose, monitor, and measure the severity of depression.

*MHPSS: Mental health and psychosocial support

MAMI Outpatient Care: Management Guide

Infant and mother pairs identified as requiring MAMI outpatient care will have been admitted based on one or more risk factors/problems identified during the assessment process. As well as providing general support which will benefit all, the MAMI Care Pathway also involves tailored support focusing on the particular risk factor(s)/problem identified.

MAMI care therefore includes:

1. Counselling on **core topics** for all enrolled pairs.
2. Tailored counselling and actions to address **specific risk factors and problems** as required.
3. **Referral** of mother-infant pairs to other relevant services as required.
4. **Continuous monitoring** of the mother-infant pair's progress and wellbeing at each visit with visit frequency reduced or increased as considered appropriate by the health worker and mother. New problems may arise or be identified during follow-up and may also require tailored support or referral.

Counselling content and suggested actions for common risk-factors/ problems is provided in the **MAMI Counselling Cards and Support Actions Booklet**. If appropriate national guidelines and packages are available, they can be used in place of, or to complement the generic MAMI materials.

	SIGNS IDENTIFIED IN ASSESSMENT	INTERVENTION	REFERRALS	MONITORING
FOR ALL ENROLLED MOTHER-INFANT PAIRS IN OUTPATIENT CARE	For all pairs enrolled in MAMI Outpatient care.	All mothers receive counselling on the following core topics: • Relaxation • Infant crying and sleep • Nurturing care for early childhood (infant) development • Family/father/community support • Family planning • Timely introduction of complementary foods For those admitted based on anthropometric measures alone (and no other risk factors or specific problems), counselling on these core topics combined with close monitoring is the main intervention they will receive. Since these infants are at increased risk of disease (e.g. infection), death and poor development, mothers and healthcare workers must be alert to any **deterioration** or **new problems** that may arise, even if initial progress is good. **Ensuring continued exclusive breastfeeding is especially important for all infants enrolled in MAMI care.**	While mother-infant pairs are in MAMI Outpatient Care, link them with any additional support they may need. For example: • Health and nutrition services • Early childhood development services • Social welfare	All mother and infant pairs should be monitored at each visit to assess their progress (see MAMI Enrolment and Follow-up form). Actively look for specific issues on each visit. Those admitted without obvious specific problems may develop new problems that require action. If the pair are progressing well, visits may take place less often (e.g. fortnightly or monthly). All infant-mother pairs should be seen at least monthly. Visits continue until the infant reaches **6 months of age, when the 6-month of age outcome review** is conducted (see MAMI Enrolment and Follow-up form).
MAMI-SPECIFIC RISK	For any infant and mother with one or more of the following: • Infant born preterm ***or*** • Low birthweight ***or*** • Multiple birth ***or*** • Adolescent mother (under 19 years) ***or*** • Mother/infant HIV+ with concerns/complications ***or*** • Mother MUAC less than 230 mm	Provide tailored counselling and support to the mother to address the specific risk factor presented. For Mother MUAC less than 230 mm, provide counselling and **refer** to appropriate nutrition services.		
FEEDING RISK	Breastfed and non-breastfed infants and mother pairs identified to have signs of a **moderate risk** during the MAMI Feeding Assessment.	Provide tailored counselling and support to the mother-infant pair to improve feeding. The ideal target diet is effective exclusive breastfeeding for the first six months of life.		
MATERNAL MENTAL HEALTH RISK	For any mother identified with **moderate mental health risk** identified using MAMI Maternal Mental Health Assessment where she scores: • 10-14 **AND** • responded 'no' to question 9 (thoughts of self-harm) For the following group, outpatient support is in addition to specialised care, if considered locally appropriate. For any mother identified with severe mental health risk identified using MAMI Maternal Mental Health Assessment where she scores: • 15+ **AND/OR** • responded 'yes' to question 9 (thoughts of self-harm)	For **moderate mental health risk**, provide counselling and support based on the support package available. See the Maternal Mental Health Support Summary to view options for possible support packages to implement if services are not currently available. For **severe mental health risk,** urgently refer to specialised mental health and psychosocial support services. **Also** enrol the mother-infant pair in MAMI outpatient care if considered locally appropriate. Where specialised services are not available, refer pair to outpatient counselling and support for **moderate mental health** risk as outlined above.		

MAMI Outpatient Care: Maternal Mental Health Support Summary

As part of MAMI Outpatient Care, all mothers receive counselling on relaxation techniques, regardless of mental health status. However, mothers (or primary caregivers) with identified mental health risk require more specialised support. This document provides guidance on the process of identifying which mental health support package is appropriate to local resources and context.

Screening

The MAMI Care Pathway uses the PHQ-2 to screen for mental health concerns as part of the MAMI Assessment. If concern is identified in screening, the PHQ-9 is used in the MAMI Maternal Mental Health Assessment. Both tools (PHQ-2 and PHQ-9) are designed to identify depression. If anxiety is considered a significant issue in your context, you may wish to consider the use of other or additional tools (e.g. PHQ-4 and GAD-7).

Target population

- All mothers (or primary caregivers) who score 10-14 on the MAMI Maternal Mental Health Assessment.
- All mothers (or primary caregivers) who score 15 or higher on the MAMI Maternal Mental Health Assessment. These mothers should also be referred to specialist MHPSS services that are equipped to address severe mental health concerns if available.

Potential interventions options

A range of mental health interventions are available to support mothers as part of MAMI Outpatient Care. Service providers should choose the most appropriate approach based on their context-specific needs, existing services, and resources available (human and financial). Several potential intervention options are detailed below to facilitate this choice. When considering the packages, ensure that the management approach is appropriate to address the conditions identified by the screening criteria.

1. ***mhGAP*** (WHO)
2. ***Problem Management Plus Approach*** (WHO)
3. ***Thinking Healthy*** (WHO)
4. ***Friendship Bench*** (LSHTM, Welcome Trust, Grand Challenges Canada, GACD, NIHR, Comic Relief, MRC, MISEREOR, Zimbabwe Health Training Support, LSTM, Kings College London, Draper Richards Kaplan Foundation, CRI Foundation)
5. ***Where there is no Psychiatrist*** (Royal College of Psychiatrists)
6. ***Basic Psychosocial Counselling Skills*** (Inter-Agency Standing Committee)
7. **Psychological First Aid** *(WHO)*

The interventions are summarised in the table below. All interventions should be researched in more detail to ensure that the approach is appropriate.

INTERVENTION PACKAGE	TARGET POPULATION	INTENDED USER	TIME TO TRAIN FRONTLINE STAFF	FREQUENCY OF INTERVENTION	CONTENT OF PACKAGE	NOTES	LINKS TO FURTHER INFORMATION
MHGAP	Any person[1] suffering from the following priority conditions: • Depression • Psychoses • Self-harm/suicide • Epilepsy • Dementia • Disorders due to substance abuse • Mental and behavioural disorders in children and adolescents • Any other significant mental health complaints (e.g., stress)	**Supervisors:** Specialist (psychiatry or neurology) physicians or nurse and/or existing non-specialized supervisors. **Implementers:** Non-specialized healthcare workers (e.g., community health workers, nurses, physicians).	**Supervisors:** 5 days. **Implementers:** 5-6 days, continuous supervision.	**Assessment:** May include more than one assessment depending on symptoms presented. **Intervention:** Dependent on condition diagnosed. For example: • **Depression:** Second appoint within a week, regular follow-up at least monthly for the first three months, reduce as condition improves. • **Dementia:** minimum follow-up every 3 months. • **Psychoses:** Initially follow up daily if possible, once responding to treatment, monthly to quarterly follow up is recommended. See resources for details on other conditions.	• Training manuals for supervisors/trainers and implementors. • General guidelines for good clinical practice. • Master chart containing common presentations of priority conditions, this guides the user to the correct modules. Modules are organized by priority conditions and contain: • **Assessment:** Flowcharts, starting with a common presentation of suspected condition, from which there is a serious of clinical assessment questions, one should move down the chart answering yes or no, in order to get a clinical assessment and management plan. • **Management:** Details on interventions that will help manage assessed conditions. • **Follow-up:** Flowchart to guide follow-up procedures.	Designed for implementation in low- and middle-income countries.	mhGAP Intervention Guide – Version 2.0

(Continued next page)

INTERVENTION PACKAGE	TARGET POPULATION	INTENDED USER	TIME TO TRAIN FRONTLINE STAFF	FREQUENCY OF INTERVENTION	CONTENT OF PACKAGE	NOTES	LINKS TO FURTHER INFORMATION
PROBLEM MANAGEMENT PLUS APPROACH	Adults (18+) with depression, anxiety or stress who live in communities affected by adversity.	**Supervisors:** Experience in mental health care required. **Implementors:** Specialized or non-specialized care providers (e.g., social workers, health workers, volunteers).	**Supervisors:** PM+ training, with two days of training in supervision. **Implementors:** Classroom training (40hrs for specialized and 80hrs for non-specialized implementers), two cases of supervised practice, and continued supervision (weekly or fortnightly depending on level of skill).	**Assessment:** Pre-intervention and post-intervention assessment. **Intervention:** 90-minute sessions (includes brief assessment at the beginning of each session) once a week for 5 weeks.	• Basic helping skills. • Structured programme and guidance of the different components of the programme (assessments, managing stress, strengthening social support etc.).	Operationalizes mhGAP psychological guidelines (designed for low- and middle-income countries) in low resource settings.	**WHO | Problem Management Plus (PM+)**
THINKING HEALTHY	Pregnant and lactating women with depression	**Supervisors:** No mental health background or cognitive behaviour therapy expertise required. **Implementers:** Community healthcare workers (no previous knowledge or experience in metal health care required).	**Supervisor:** Received Thinking Healthy training and practised methods under supervision for 12 months. **Implementers:** Training for 5-10 days and supervision conducted every month.	**Assessment:** Formal assessment not specified (instead, common signs of depression explained). **Intervention:** Session should last 45min - 1hr (includes brief assessment at the beginning of each session using Mood Charts). Frequency of visits is flexible, but recommended frequency shown below: • **14-40 weeks prenatal:** introductory sessions (2 visits) then weekly sessions. • **3rd-5th week postnatal:** fortnightly. • **2nd-10th month postnatal:** monthly.	• Communication skills. • Structured programme including: 1. Reference manual (acts as a training manual and step by step guide for healthcare worker). 2. Calendar for each mother, which contains key messages and monitoring tools that allows the mother to track her and her infant's progress.	Operationalizes mhGAP guidelines (designed for low-middle income countries) for perinatal depression in low resource settings. Designed to be integrated into community health worker's routine home visits.	**WHO | Thinking Healthy**
FRIENDSHIP BENCH	Adults (18+), with mild to moderate level common mental health disorders (e.g., anxiety, depression and somatoform disorders). Programmes have also adapted the Friendship Bench model to serve adolescents.	**Supervisors:** Existing supervisors (e.g., health promotion officers), supported by clinical psychologists and psychiatrists. **Implementors:** Community health workers (no mental health background required).	**Supervisors:** 2 months of training. **Implementers:** 9 days of training. Current guidelines on training required are extracted from randomised control trails. General training guidance is currently under development.	**Assessment:** Pre-intervention, at the 3rd session, and at follow up at 6 months. **Intervention:** 6 weekly 45-minute sessions.	• How to assess common mental disorders using Shona System Questioner (SSQ-14). • Counselling skills. • Problem solving therapy and how to use it.	Designed for low-, middle-, and high-income countries. Implementers sit with clients outdoors, under trees or on benches in discreet, safe spaces in the community. After one-to-one therapy, clients are referred to peer-led support groups, which provide ongoing support and an opportunity to engage in revenue-generating activities.	**The Friendship Bench Training Manual | Mental Health Innovation Network**

(Continued next page)

INTERVENTION PACKAGE	TARGET POPULATION	INTENDED USER	TIME TO TRAIN FRONTLINE STAFF	FREQUENCY OF INTERVENTION	CONTENT OF PACKAGE	NOTES	LINKS TO FURTHER INFORMATION
WHERE THERE IS NO PSYCHIATRIST	General population suffering from mental health problems including: • Common mental disorders (e.g., depression). • Habits that cause problems (e.g., alcohol abuse). • Severe mental disorder (e.g., psychosis). • States of confusion (e.g. dementia). • Mental health problems in children/adolescents (e.g., conduct disorders). • Other conditions (e.g. epilepsy). See resources for full list of conditions covered.	**Supervisors:** Mental health specialist where possible. **Implementors:** Non-specialized healthcare workers (e.g. doctor, nurse, social worker).	No specific training detailed – provides an in-depth guide for identification and management of mental health problems, rather than step by step programme, with specific training.	Assessment and intervention: Specific to mental health problem and management strategy implemented.	• Core skills. • Assessments. • Specific treatments for mental health problems (e.g., medication, counselling and social support). • Management of clinical problems associated with mental health problems. • Integrating mental health into other services (e.g., healthcare and community platforms). • Adapting and implementing guidance.	Designed for low- and middle-income countries or low resource settings in high-income countries.	Where There Is No Psychiatrist: A Mental Health Care Manual, 2nd edition
BASIC PSYCHOSOCIAL COUNSELLING SKILLS	Any person affected by Covid-19 (e.g., illness, loss, affected by restrictions)	**Supervisors:** Not specified **Implementers:** Any person providing a critical function during Covid-19 (e.g., health worker, shop keepers, person providing care/support to family/friends)	**Supervisors:** Not specified **Implementers:** 3 hours. Orientation package provided in PowerPoint format. Training can be expanded to one full day if in-depth discussion and role play exercises are added.	**Assessment:** Not required **Intervention:** For day-to-day interactions, no follow up required	• Basic psychosocial skills and how to use them to help another feel supported. • How to look after ourselves so we can help others.	While guide is focused on Covid-19 response, skills and information are applicable to other settings.	Basic Psychosocial Skills: A Guide for COVID-19 Responders
PSYCHOLOGICAL FIRST AID	PFA is for distressed people who have been recently exposed to a serious crisis event. You can provide help to both children and adults.	Any person that needs to support others after a traumatic event. For example, health worker, NGO staff or teacher. No previous training/ experience required.	**Implementers:** Approximately 3 hours. Facilitators manual for orienting field workers and accompanying slide show provided.	PFA is aimed at helping people who have been very recently affected by a crisis event. You can provide PFA when you first have contact with very distressed people. This is usually during or immediately after an event. However, it may sometimes be days or weeks after, depending on how long the event lasted and how severe it was.	• Understanding PFA. • How to help responsibly. • Providing PFA. • Caring or yourself and your colleagues. • Practice what you have learned. • Pocket Guide.	Handbook available in multiple languages.	Psychological First Aid (WHO) Guide for Field Workers. Accompanying slide show in English

6 Health Worker Support Materials

6.1. Forms

Forms are provided for health workers to record and monitor key information to support care. The forms are as follows:

- MAMI Assessment Form
- MAMI Feeding Assessment Form
- MAMI Maternal Mental Health Assessment Form
- MAMI Enrolment and Follow Up Form

MAMI ASSESSMENT FORM

Basic Information

Infant name (first & last name)					**ID no.**	
					Date of assessment	_____ /_____ /_____
Sex	male	female	**Infant age**	_____ months _____ weeks	**Date of birth**	_____ /_____ /_____
Primary caregiver name					**Relationship to infant**	mother
						grandmother
						other:
Source of referral	community screening	outpatient clinic	inpatient care	self-referral	other:	

STEP 1 CHECK FOR DANGER SIGNS (infant)

DANGER SIGNS	**Unable to breastfeed / drink?**	no	yes
	Vomits everything?	no	yes
	Bilateral pitting oedema *(+, ++ or +++)*?	no	yes
	Mother appears out of touch with reality or at risk of harming herself or infant; visible physical neglect (mother or infant)	no	yes
	Other IMCI danger sign(s)? Specify:		
ACT	**IF ANY DANGER SIGN → refer URGENTLY to hospital**		

STEP 2 ASSESS CLINICAL SIGNS AND SYMPTOMS (infant)

CLINICAL SIGNS & SYMPTOMS	*Classify according to IMCI*	green	Yellow	Pink
	Diarrhoea	none	mild/ moderate	severe
	Fever	none	mild/ moderate	severe
	Cough	none	mild/ moderate	severe
	Severe pallor (anaemia)	none	–	severe

CLINICAL SIGNS & SYMPTOMS	*Classify according to IMCI*	green	Yellow	Pink
	Any other illness (refer to IMCI)	none	mild/ moderate	severe
	Specify other illness:			
	Congenital condition/ disability causing feeding difficulty *(e.g. cleft lip, tongue tie)*	none	**yes:**	

STEP 3 ASSESS GROWTH (infant)

MUAC:	___ ___ ___ **mm**	**Weight:**	___ . ___ ___ **kg**	**Birthweight:**	___ . ___ ___ **kg**
Length:	___ ___ . ___ **cm**	**WAZ:**		**WLZ:**	

Classify weight-for-age z-score (WAZ) or weight-for-length z-score (WLZ) using infant growth charts.

WAZ <-2.0	no	yes
WLZ <-2.0	no	yes
MUAC less than 110mm (infants < 6 weeks)	no	yes (age <6 weeks)
MUAC less than 115mm (infants 6 weeks to < 6 months)	no	yes (age 6 weeks – 6 months)
Recent weight loss or failure to gain adequate weight	no	yes
Other - specify:		

STEP 4 ASSESS KEY MAMI RISK FACTORS (infant & mother)

Mother absent or dead	no	absent or dead
Low birthweight (2500g or less)	no	yes
Born preterm	no	yes
Multiple birth	no	yes
Adolescent mother (under 19 years)	no	yes
Mother HIV+ with concerns	no	yes
Mother's MUAC	___ ___ ___ mm	

Mother's MUAC less than 230mm	no	yes
Infant cries excessively / has sleep problems (reported)	no	yes
Any other concerns (e.g., maternal TB, other illness, colic)?	no	yes
Specify other concern:		

(Continued next page)

STEP 5 SCREEN FOR FEEDING RISK (infant & mother)

	LOW FEEDING RISK	POTENTIAL FEEDING RISK
Are you the infant's biological mother? *If not, ask:* What is the reason?	biological mother	mother dead or absent
Is the infant breastfed?	breastfed	not breastfed
If infant is breastfed: What other foods or drinks does the infant receive?	none (only breastmilk)	any other foods or drinks
Any problems feeding your infant?	no	yes

ACT	ANY SIGN OF POTENTIAL FEEDING RISK → conduct feeding assessment		
Infant feeding practices:	exclusively breastfed	mixed feeding	not breastfed
Feeding risk based on assessment:	low feeding risk		moderate feeding risk
Details of any feeding difficulties:			

STEP 6 SCREEN FOR MATERNAL MENTAL HEALTH CONCERN

Over the last two weeks, how often have you been bothered by the following problems?	not at all	several days	more than half the days	nearly every day
Little interest or pleasure in doing things?	0	1	2	3
Feeling down, depressed, or hopeless?	0	1	2	3
Add column scores:		_____	_____	_____
SCREENING SCORE:				

Screening score 2 or less, but health worker concerned about mother's mental health	no	yes, specify:

ACT	SCREENING SCORE 3+ OR CONCERN ABOUT MOTHER'S MENTAL HEALTH → Conduct mental health assessment	ASSESSMENT SCORE:_____

MAMI ASSESSMENT SUMMARY

Step 1: Any clinical sign requiring referral to hospital or specialised services?	no	-	yes
Step 2: Any sign of infant growth failure?	no	yes	-
Step 3: Any other risk factors?	no	yes	-
Step 4: Any sign of moderate feeding risk?	no	yes	-
Step 5: Maternal mental health assessment score (if applicable)	0 – 9 ***and*** 'no' to Question 9 (thoughts of self-harm)	10 – 14 ***and*** 'no' to Question 9 (thoughts of self-harm)	15+ ***and/or*** 'yes' to Question 9 (thoughts of self-harm)
Classify & refer	**LOW RISK: If all signs circled, refer to routine healthcare & IYCF counselling**	**MODERATE RISK: If any sign circled, enrol in MAMI Outpatient Care**	**HIGH RISK: If any sign circled, refer to hospital or specialised services**
Other – specify:			

Main problems identified:
1.

2.

3.

If not following advice above on referral options, document why:

MAMI FEEDING ASSESSMENT FORM

Basic Information			
Infant name (first & last name)		**ID no.**	
		Date of assessment	_____ /_____ /_____

STEP 1 Establish mode of infant feeding

1. **What and how do you feed the infant?**	☐ Mother's breastmilk (directly at breast) ☐ Mother's expressed breastmilk (by cup/spoon/bottle) ☐ Donor human milk (by cup/spoon/bottle)	☐ Informally shared expressed breastmilk (by cup/spoon/bottle) ☐ Breastfed by a woman who is not the infant's mother ☐ Breastmilk substitute (by cup/spoon/bottle) ☐ Breastmilk substitute (by cup/spoon/bottle) ☐ Other: _____
If infant not breastfed / not given breastmilk, skip to STEP 4		

STEP 2 If infant is breastfed or given breastmilk, ask Questions 2 & 3

	SIGNS OF LOW FEEDING RISK	SIGNS OF MODERATE FEEDING RISK
2. **Please tell me about any difficulties with breastfeeding:**	none	notes:
3. **How many times is the infant breastfed or given breastmilk in 24 hours?**	8+ feeds in 24h	less than 8 feeds in 24h

STEP 3 If directly breastfeeding, request permission to observe breastfeeding and examine the breasts:

Infant well-attached to breast?	well-attached	not well-attached
Infant suckling effectively?	suckling effectively	not suckling effectively
Any breast conditions (e.g., mastitis, thrush, pain)**?**	no	yes
Specify breast condition:		

STEP 4 Check if the infant receives anything other than breastmilk, ask Question 4:

4. **What other foods or drinks does the infant receive?**	none	☐ Water or other liquids (e.g., tea, juice) ☐ Other milk (e.g., powdered or condensed milk) ☐ Food ☐ Other: _____ ☐ **Potential feeding risk: infant formula**

STEP 5 If the infant receives infant formula, ask Questions 5 – 10:

5. **What type of formula does the infant receive?**	Specify formula:	
	Appropriate formula	Inappropriate formula
6. ***If using powdered formula:* What source of water is used?**	safe water (e.g., boiled)	unsafe water
7. **How is infant formula prepared?** (e.g., number of scoops of powder per volume of water)	correctly	incorrectly
8. **Is formula fed with a feeding bottle?**	no	yes
9. **How much formula does the infant consume at each feed** (liquid)**?** *Refer to guide below.*	sufficient infant formula for age	insufficient infant formula for age
10. **Please tell me about any difficulties with feeding:**	none	notes:

Feeding risk based on assessment	LOW FEEDING RISK if all signs circled in this column	MODERATE FEEDING RISK if any sign circled in this column
ACT	**RETURN TO MAMI ASSESSMENT FORM AND COMPLETE ASSESSMENT**	

Guide to infant formula intake per day by age

Age of infant in months	0 – 1	1 – 2	2 – 3	3 – 4	4 – 5	5 – 6
Weight in kilograms	3	4	5	5	6	6
Amount of infant formula per day	450ml	600ml	750ml	750ml	900ml	900ml
Number of feeds per day	8	7	6	6	6	6
Size of each feed	60ml	90ml	120ml	120ml	150ml	150ml

Table retrieved from: **https://www.ennonline.net/attachments/2410/UNHCR_BMS-SOP-LAY2-ANNEXES-D-(1).pdf**

MAMI MATERNAL MENTAL HEALTH ASSESSMENT FORM

Basic Information

Primary caregiver name		**ID no.**	
Infant name		**Date of assessment**	_____ /_____ /_____

Over the last <u>two weeks,</u> how often have you been bothered by the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things?	0	1	2	3
2. Feeling down, depressed, or hopeless?	0	1	2	3
3. Trouble falling or staying asleep? Or sleeping too much?	0	1	2	3
4. Feeling tired or having little energy?	0	1	2	3
5. Poor appetite? Or over-eating?	0	1	2	3
6. Feeling bad about yourself? Or that you are a failure? Or have let yourself or your family down?	0	1	2	3
7. Trouble concentrating on things, such as following a conversation with people?	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed a difference? Or being so fidgety or restless that you have been moving around a lot more than usual?	0	1	2	3
9. Thought that you would be better off dead or of hurting yourself in some way?	0	1	2	3
		Add column scores:	_____	_____	_____
		TOTAL ASSESSMENT SCORE:			

ACT				
	Classify	**LOW RISK:** 0 – 9 ***and*** 'no' to Question 9 (thoughts of self-harm)	**MODERATE RISK:** 10 – 14 ***and*** 'no' to Question 9 (thoughts of self-harm)	**HIGH RISK:** 15+ ***and/or*** 'yes' to Question 9 (thoughts of self-harm)
	Other – specify:			

Notes:

ACT	**RETURN TO MAMI ASSESSMENT FORM AND COMPLETE ASSESSMENT**

MAMI ENROLMENT AND FOLLOW-UP FORM

Basic Information

Infant name		**Date of enrolment**	____ /____ /____
		ID no.	
Primary caregiver name		**Date of birth**	____ /____ /____
		Sex	male / female
Contact phone 1		**Contact phone 2**	
Address	**Province:**	**District:**	**Village:**
House details/ landmarks			

Visit number	**Adm (0)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Date										
Age in months										

Monitoring: *Infant clinical progress*

Danger sign (Y/N)										
Oedema (Y/N)										
Episode of illness (Y – describe/N)										
Clinically well & alert (Y/N)										

Monitoring: *Growth / nutritional status*

Weight (kg)										
Weight change (g/kg/day)										
WFA (z-score)										
Length (cm)										
WFL (z-score)										
MUAC (mm) – infant										
MUAC (mm) – mother										

*WEIGHT CHANGE: If not gaining adequate weight, consider repeat assessment and/or refer to inpatient care.
(poor = <5g/kg/day; adequate = 5 – 10g/kg/day; good = >10g/kg/day)

Monitoring: *Feeding*

Breastfeeding status (EBF / mixed / NBF)										
At least 8 – 12 feeds in 24h? (Y/N)										
At least 5 – 6 wet diapers in 24h (urine)? (Y/N)										
At least 2 soiled diapers in 24h (stools)? (Y/N)										
Are breasts & nipples comfortable? (Y/N)										
Non-breastfed or mixed fed: consuming safe & appropriate infant formula (Y/N)										
Any feeding concerns? (Y/N)										

Monitoring: *Maternal mental health*

1. How are you feeling compared to last visit? (-, 0, +)										
2. Little interest or pleasure in doing things? (0, 1, 2, 3)										
3. Feeling down, depressed, or hopeless? (0, 1, 2, 3)										
Total score on questions 2 & 3:										

If total score on questions 2 & 3 is 3 or more, then repeat MAMI Maternal Mental Health Assessment and refer based on outcome.

NEXT VISIT & MAIN OUTCOMES

Name of examiner										
Visit outcome										
Date of next visit										

Outcome codes: A=absent; **D**=defaulted (absent for 3 consecutive visits); **INP**=referral to inpatient; **AO**=aged out at 6 months; **X**=died

(Continued next page)

Visit summary & advice given

(refer to original MAMI Assessment to ensure main problems addressed; also discuss any new concerns)

Date	Actions & advice given	Date	Actions & advice given
____ /____ /____		____ /____ /____	
____ /____ /____		____ /____ /____	
____ /____ /____		____ /____ /____	
____ /____ /____		____ /____ /____	
____ /____ /____		____ /____ /____	

TOPICS to discuss with ALL carers (date covered & notes)

1. Relaxation	(EVERY VISIT)
2. Crying, sleep	
3. Nurturing care	
4. Family/father support	
5. Family planning	
6. Complementary feeding	

ACT	**DECIDE ON FREQUENCY OF SUBSEQUENT FOLLOW UP VISITS (ASSESS AT EACH VISIT):**	
Reduce frequency *when ALL of the following:*	☐ Adequate weight gain for at least 2 consecutive weeks (more than 5g/kg/day) ☐ Clinical issues resolved (or resolving) ☐ Feeding issues resolved (or resolving) ☐ Maternal health / mental health issues resolved (or resolving) ☐ Mother/carer satisfied with progress	weekly → fortnightly fortnightly → monthly monthly → monthly
Continue with current frequency *when ANY of following:*	☐ Inadequate weight gain (less than 5g/kg/day) ☐ Ongoing clinical sign or symptom ☐ Ongoing feeding issues ☐ Ongoing maternal mental health issue ☐ Mother/carer has continued concerns needing regular visits/support	weekly → weekly fortnight → fortnightly
Increase frequency *when ANY of following:*	☐ Some weight loss (outside of immediate postnatal period) ☐ Inadequate weight gain after 3 weeks (less than 5g/kg/day)	fortnightly → weekly monthly → weekly
Refer to hospital or specialised services *when ANY of following:*	☐ Any new IMCI danger sign → URGENT hospital referral ☐ Significant weight loss ☐ Worsening mental health concern	

FINAL VISIT: 6-MONTH OF AGE OUTCOME

STEP 1: Infant clinical progress	infant clinically well	any new/ongoing clinical problem	any danger sign
STEP 2: Infant & mother nutritional status	no signs of nutritional risk	eligible for nutrition services e.g.: low WLZ or WAZ: <-2 or <-3 low MUAC: <125mm or <115mm or oedema	-
STEP 3: Infant feeding progress	no sign of feeding problem	ongoing feeding problem	-
STEP 4: Maternal mental health	no maternal mental health concern	new or ongoing maternal mental health concern (score 10-14)	new or ongoing maternal mental health concern (score 15+)
Classify & refer (if referred please state where)	**If all signs circled,** refer to routine healthcare & IYCF counselling _____	**If any sign circled,** refer to appropriate clinical / nutrition / MHPSS services: _____	**If any sign circled,** refer urgently to hospital or specialised MHPSS services _____
	Other – specify:		

6.2. Supplementary Material

MAMI Health Workers Support Materials User Booklet
This is available from: **https://www.ennonline.net/mamicarepathway**

MAMI Counselling Cards and Support Actions Booklet
This is available from: **https://www.ennonline.net/mamicarepathway**

Annex 1 MAMI Care Pathway Group development contributors

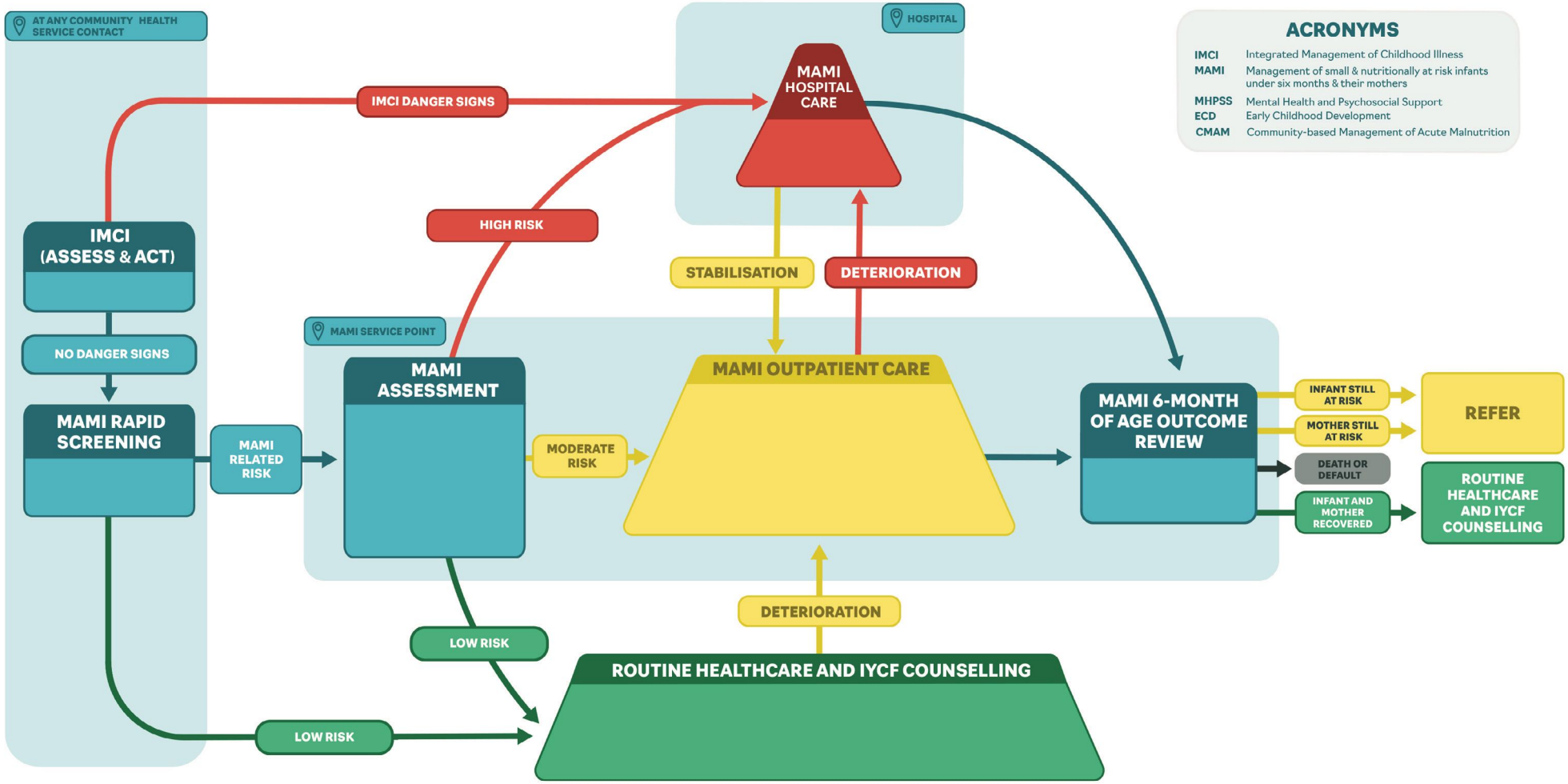
Core Committee: Alice Burrell (Save the Children), Eleanor Rogers (ENN), Hatty Barthorp (GOAL), Kelsey Grey (ENN/LSHTM), Kirrily de Polnay (MSF), Kirsten Hanson (USAID), Marie McGrath (ENN), Marko Kerac (LSHTM), Praveen Kumar (Kalawati Saran Children's Hospital, Lady Hardinge Medical College, India).

Maternal mental health subgroup: Alice Burrell (Save the Children), Andrew Clarke (Save the Children), Andy Solomon Osborne (Action Against Hunger – Ethiopia), Anne Filorizzo Pla (Save the Children), Cécile Bizouerne (ACF), Charlotte Hanlon (King's College London), Fatima Batool (WHO), Hatty Barthorp (GOAL), Jonathan Wells (UCL), Karine Le Roch (ACF), Mubarek Abera (Jimma University), Neerja Chowdhary (WHO), Robert Stewart (University of Edinburgh), Tarun Dua (WHO), Xanthe Hunt (WHO), Cristina Carreño (MSF).

Advisory Group: Alice Burrell (Save the Children), Caroline Antoine (ACF), Deborah Wilson (WFP), Eleanor Rogers (ENN), Grace Funnell (UNICEF), Hatty Barthorp (GOAL), Imara Gluning (NHS), Katie Beck (JSI), Kelsey Grey (ENN/LSHTM), Kirrily de Polnay (MSF), Kirsten Hanson (USAID), Laura Latina (MSF France), Leonie Van Mil (Concern), Louise Day (LSHTM), Marie McGrath (ENN), Marisa Sanchez Peinado (ACF), Marko Kerac (LSHTM), Martha Mwangome (KEMRI/Wellcome Trust Research Programme), Mathieu Nemerimana (Partners In Health), Melkamu Berhane (Jimma University, Ethiopia), Nicki Connell (ECF), Praveen Kumar (Kalawati Saran Children's Hospital, Lady Hardinge Medical College, India), Ritu Rana (GOAL), Sarah O'Flynn (Save the Children), Silvia Barbazza (ACF), Smita Kumar (USAID), Tabitha Kieviet van Immerzeel (LSHTM), Alice Allan (Independent), Smita Hanciles (NHS).

Editing and design: Tim Harcourt-Powell, Orna O'Reilly, Eilise Brennan (ENN).

Annex 2a MAMI Care Pathway: Overview (blank)



*Death or default may occur at any point in the pathway and requires further investigation.

Annex 2b MAMI Care Pathway: Who, What, Where (blank)

SCREENING

WHAT?

Screen and refer for assessment using:

IMCI and MAMI-specific danger signs checks

Infant growth

Infant feeding

Maternal health and wellbeing

WHERE?

WHO?

GUIDES & FORMS

MAMI Rapid Screening Guide

ASSESSMENT

WHAT?

IMCI and MAMI-specific clinical assessment

Infant growth

Infant feeding

Maternal health and wellbeing

WHERE?

WHO?

GUIDES & FORMS

- MAMI Assessment Guide & Form
- MAMI Feeding Assessment Guide & Form
- MAMI Maternal Mental Health Assessment Guide & Form
- MAMI Enrolment & Follow Up Form

SUPPORT AND MANAGEMENT

MAMI INPATIENT CARE

WHAT?

1. Clinical care to achieve clinical stabilisation.
2. Provide treatment for congenital conditions affecting feeding (e.g. tongue tie), feeding support, and maternal mental health support.
3. If child reaches 6 months of age in inpatient care, conduct 6 month of age outcome review from inpatient facility.

WHERE?

WHO?

GUIDES & FORMS

Refer to existing national guidance on inpatient treatment of infants under six months with wasting and clinical complications

MAMI OUTPATIENT CARE

WHAT?

1. Counselling on **core topics** for all enrolled pairs.
2. Tailored counselling and actions to address **specific risk factors and problems** as required:
   - Clinical care
   - Feeding counselling & support
   - Mental Health and Psychosocial
   - Support (MHPSS) for mothers
3. Monitoring of progress of mother infant pairs and adjust follow up frequency as appropriate.

WHO?

- Clinical care:
- Tailored feeding counselling & support:
- MHPSS for mothers:
- Monitoring of progress:

WHERE?

REFERRAL TO OTHER AVAILABLE SUPPORT SERVICES AS NEEDED, E.G.

GUIDES & FORMS

- MAMI Enrolment & Follow Up Form
- MAMI Counselling Cards & Support Actions Booklet

6-MONTH OF AGE OUTCOME REVIEW

WHAT?

Assessment at 6 months of age.

IMCI and MAMI-specific clinical assessment

Infant growth

Infant feeding

Maternal health and wellbeing

Referral to support services for continued care if required.

WHERE?

WHO?

CONTINUUM OF CARE

- Infant malnutrition → wasting treatment
- Feeding problems → IYCF
- Clinical issues → IMCI

GUIDES & FORMS

MAMI Enrolment & Follow Up Form

ACRONYMS **IYCF –** Infant and Young Child Feeding **MHPSS –** Mental Health and Psychosocial Support **IMCI –** Integrated Management of Childhood Illnesses

References

1. MAMI Global Network. What is MAMI? https://www.ennonline.net/ourwork/research/mami2021
2. Grijalva-Eternod C, Kerac M, McGrath M, Wilkinson C, Hirsch J, Delchevalerie P, et al. Admission profile and discharge outcomes for infants aged less than 6 months admitted to inpatient therapeutic care in 10 countries. A secondary data analysis. Maternal and Child Nutrition. 2016;13.
3. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. The Lancet. 2013;382(9890):427-51.
4. Wang H, Bhutta ZA, Coates MM, Coggeshall M, Dandona L, Diallo K, et al. Global, regional, national, and selected subnational levels of stillbirths, neonatal, infant, and under-5 mortality, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015. The Lancet. 2016;388(10053):1725-74.
5. de Onis M WT, Onyango AW. Worldwide practices in child growth monitoring. Journal of Pediatrics 2004;144:461-5.
6. Gonzalez-Viana E, Dworzynski K, Murphy MS, Peek R, Guideline C. Faltering growth in children: summary of NICE guidance. BMJ. 2017;358:j4219.
7. Katz J, Lee AC, Kozuki N, Lawn JE, Cousens S, Blencowe H, et al. Mortality risk in preterm and small-for-gestational-age infants in low-income and middle-income countries: a pooled country analysis. Lancet. 2013;382(9890):417-25.
8. Martin A, Connelly A, Bland RM, Reilly JJ. Health impact of catch-up growth in low-birth weight infants: systematic review, evidence appraisal, and meta-analysis. Matern Child Nutr. 2017;13(1).
9. WHO. Updates on the management of severe acute malnutrition in infants and children (Guideline) 2013 [Available from: http://www.who.int/nutrition/publications/guidelines/updates_management_SAM_infantandchildren/en/index.html.
10. Mwangome M, Ngari M, Bwahere P, Kabore P, McGrath M, Kerac M, et al. Anthropometry at birth and at age of routine vaccination to predict mortality in the first year of life: A birth cohort study in BukinaFaso. PloS one. 2019;14.
11. Mwangome M, Ngari M, Fegan G, Mturi N, Shebe M, Bauni E, et al. Diagnostic criteria for severe acute malnutrition among infants aged under 6 mo. The American journal of clinical nutrition. 2017;105.
12. Mwangome M, Fegan G, Fulford T, Mulberg A, Berkley J. Mid-upper arm circumference at age of routine infant vaccination to identify infants at elevated risk of death: A retrospective cohort study in the Gambia. Bulletin of the World Health Organization. 2012;90:887-94.
13. Kerac M, Frison S, Connell N, Page B, McGrath M. Informing the management of acute malnutrition in infants aged under 6 months (MAMI): risk factor analysis using nationally-representative demographic & health survey secondary data. PeerJ. 2019;6:e5848.
14. Lelijveld N, Kerac M, McGrath M, Mwangome M, Berkley JA. A review of methods to detect cases of severely malnourished infants less than 6 months for their admission into therapeutic care 2017 [Available from: http://www.ennonline.net/mamicasedetectionreview.]
15. Campbell H, Hotchkiss R, Bradshaw N, Porteous M. Integrated care pathways. Bmj. 1998;316(7125):133-7.
16. World Health Organization, UNICEF. Integrated Management of Childhood Illness: management of the sick young infant aged up to 2 months. IMCI chart booklet. https://www.who.int/publications/i/item/9789241516365; 2019.
17. World Health Organization. Integrated Management of Childhood Illness: Chart booklet: Geneva: World Health Organization; 2014.
18. World Health Organization. What is Integrated Management fof Childhood Illness (IMCI)? : World Health Organization,; 2018 [Available from: https://www.who.int/maternal_child_adolescent/child/imci/background/en/.]
19. Bhutta ZA, Berkley JA, Bandsma RHJ, Kerac M, Trehan I, Briend A. Severe childhood malnutrition. Nat Rev Dis Primers. 2017;3:17067.
20. Singhal A. Long-Term Adverse Effects of Early Growth Acceleration or Catch-Up Growth. Ann Nutr Metab. 2017;70(3):236-40.
21. Kerac M, McGrath M, Connell N, Kompala C, Moore W, Bailey J, et al. 'Severe malnutrition': thinking deeply, communicating simply. BMJ Global Health. 2020;5:e003023.
22. Britto PR, Lye SJ, Proulx K, Yousafzai AK, Matthews SG, Vaivada T, et al. Nurturing care: promoting early childhood development. Lancet. 2017;389(10064):91-102.
23. World Health Organization. Improving Early Childhood Development: WHO Guideline2021.
24. Sabanathan S, Wills B, Gladstone M. Child development assessment tools in low-income and middle-income countries: how can we use them more appropriately? Arch Dis Child. 2015;100(5):482-8.
25. Grey K, Gonzales G, Abera M, Lelijveld N, Thompson D, Berhane M, et al. Severe malnutrition or famine exposure in childhood and cardiometabolic non-communicable disease later in life: a systematic review. BMJ Global Health. 2021;6(3).

26. Mandy M, Nyirenda M. Developmental Origins of Health and Disease: the relevance to developing nations. Int Health. 2018;10(2):66-70.

27. Thurstans S, Opondo C, Seal A, Wells J, Khara T, Dolan C, et al. Boys are more likely to be undernourished than girls: a systematic review and meta-analysis of sex differences in undernutrition. BMJ global health. 2020;5(12).

28. Arafat Y, Islam MM, Connell N, Mothabbir G, McGrath M, Berkley J, et al. Perceptions of Acute Malnutrition and Its Management in Infants Under 6 Months of Age: A Qualitative Study in Rural Bangladesh. Clinical Medicine Insights: Pediatrics. 2018;12:117955651877169.

29. ENN, LSHTM, Children St. Management of At risk Mothers and Infants under six months (MAMI) Special Interest Group (SIG) meeting. 2018.

30. Read S, McGrath M. Community management of uncomplicated malnourished infants under six months old: barriers to national policy change. Field Exchange. 2018.

31. Read S. Improving community management of uncomplicated acute malnutrition in infants under six months (C-MAMI): Developing a checklist version of the C-MAMI tool. Field Exchange. 2017.

32. Butler S CN, Barthorp H. C-MAMI tool evaluation: Learnings from Bangladesh and Ethiopia. Field Exchange. 2018.

33. ENN, LSHTM. A simple IMCI-sytle tool for assessing, identifing/classifying and managing uncomplicated acute malnutrition in infants < 6 months of age in the community - the "c-MAMI" tool 2016 [Available from: http://www.ennonline.net/c-mami]

34. ENN, LSHTM, Children St, GOAL, Collaborators. C-MAMI tool v2 - Management of At Risk Mothers and Infants (MAMI) 2021 [Available from: https://www.ennonline.net/ourwork/research/mami]

35. Keuter A, Burrell A, Butler S, Sarwar M, Rahaman H. Piloting the C-MAMI approach in the Rohingya response in Bangladesh. Field Exchange. 2018.

36. Brugaletta C, Le Roch K, Saxton J, Bizouerne C, McGrath M, Kerac M. Breastfeeding assessment tools for at risk and malnourished infants aged under 6 months old: a systematic review [version 1; peer review: 3 approved]. F1000Research. 2020;9(1310).

37. Rana R, McGrath M, Gupta P, Thakur E, Kerac M. Feeding Interventions for Infants with Growth Failure in the First Six Months of Life: A Systematic Review. Nutrients. 2020;12(7).

38. Campion-Smith TJ, Kerac M, McGrath M, Berkley JA. Antimicrobial and micronutrient interventions for the management of infants under 6 months of age identified with severe malnutrition: a literature review. PeerJ. 2020;8:e9175.

39. Beck K, Kirk CM, Bradford J, Mutaganzwa C, Nahimana E, Bigirumwami O. The Paediatric Development Clinic: A model to improve outcomes for high-risk children under-five in Rwanda. Field Exchange. 2018.

40. Angood C, McGrath M, Mehta S, Mwangome M, Lung'aho M, Roberfroid D, et al. Research priorities to improve the management of acute malnutrition in infants aged less than six months (MAMI). PLoS Med. 2015;12(4):e1001812.

Cover photos *(Top right to bottom left)*: ©UNICEF/UN07288/Tremeau; ©UNICEFROSA/2016/GPirozzi; ©Save the Children/Bangladesh/2016; ©UNICEFROSA/RogerLemoyne2015; ©UNICEFROSA/RogerLemoyne2015; ©UNICEF/UN065254/Phelps; ©UNICEF/UNI117114/Pirozzi; ©UNICEF/India/Prashanth Vishwanathan

MAMI
Global Network

The MAMI Care Pathway Package development is managed and produced by the ENN as co-lead of the MAMI Global Network.

www.ennonline.net/ourwork/research/mami

ENN, 2nd Floor, Marlborough House, 69 High Street, Kidlington, Oxfordshire, UK, OX5 2DN
www.ennonline.net Contact: **mami@ennonline.net**

Irish Aid
Rialtas na hÉireann
Government of Ireland

Eleanor Crook
Foundation

ENN