

# FAILURE TO THRIVE OR WEIGHT FALTERING IN A PRIMARY HEALTH CARE SETTING

**Astrid Berg**



A Javanese family at Tasik Malaya, Java (Photo: CH Graves, c1902)

Astrid Berg MB ChB,  
FCPsych (SA), M Phil (Child  
& Adolescent Psychiatry)

Red Cross War Memorial  
Children's Hospital and  
University of Cape Town, Cape  
Town, South Africa

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A mother's first concern is about whether she can maintain the life and growth of her baby (Stern, 1995). Feeding the infant and seeing it develop is a primary task which all parents wish to fulfil. Most mothers want only the best for their offspring. In turn, the child possesses an inborn drive to move forward, to grow and to progress – children are meant to thrive. Sadly, this fundamental right is missing for many infants all over the world. When things go wrong, when the growth of the baby is impeded for whatever reason, it becomes a serious and profound problem for the parents. It is worth reflecting on the meaning of naming this condition “failure to thrive”: does it not imply failure on the part of the caregiver? Could this not do an injustice to the parent? In future we may consider “faltering weight” as a better, less pejorative term to describe this condition.

Feeding varies considerably among children during infancy and feeding problems are very common, affecting up to 30% of infants depending on how feeding problems are defined. However disorders of feeding are still poorly understood. The causes of infant feeding problems are multifactorial, not well known and overlapping the fields of paediatrics and mental health, although physical causes need to always be excluded.

Research has shown that in developing countries children under the age of 5 years are prevented from reaching their full potential because of exposure to multiple risk factors. Poverty plays a central role in mental health in general for adults (Lund C et al, 2010), but particularly it does so for young children. Malnutrition in the early years has serious consequences for brain development (Grantham-McGregor et al, 2007) which could adversely affect children's later ability to learn and progress in school. The long term adverse effect of failure to thrive on cognitive ability should not be underestimated; it has been estimated to be around 4 IQ points. (Corbett & Drewett, 2004)

It is important for infant and child health workers to know that malnutrition is not simply a matter of inadequate food intake or physical illness, but that it can be a manifestation of things having gone wrong in the relationship between mother and child. The term *feeding* does imply that a two-way relationship is part of eating in early childhood (Chatoor, 2002) – a delicate interplay exists between mother and child in the feeding situation. While the World Health Organization recognizes the importance of *stimulation* for young children, there is insufficient emphasis on the centrality of the caregiver-child relationship in the actual feeding situation.

This chapter focus specifically on how priority can be given to the relationship between caregiver and child within the context of a primary health care setting in a developing country such as South Africa. The categories which describe the various reasons for faltering weight are described. The focus throughout shall be on the very young child, under 12 months, bearing in mind that the effects of early problems in this domain extend far beyond the first year of life. The word “mother” is used to denote the adult who is the main caregiver and who fulfils the traditional “mothering” functions. It does not exclude other caregivers such as father, grandparents, day carers and foster parents.

### Feeding

The term “feeding” implies a two-way relationship, a delicate interplay between mother and child in the feeding situation.

## DEFINITIONS AND CLASSIFICATION

*Failure to thrive* can be regarded as a descriptive umbrella term which refers to inadequate growth due to a nutritional deficiency. Failure to thrive is often used in clinical practice to mean that the current weight or rate of weight gain of a child are significantly below that expected of similar children of the same sex and age. There is no definite accepted measure to diagnose the condition; most practitioners diagnose failure to thrive when a child's weight for age falls below the fifth centile of the standard growth chart (see Appendix B.2.1). Although failure to thrive was once classified into organic and nonorganic, it is now seen to be the result of the interaction between the environment and the child's health, development and behaviour (Gahagan, 2006). Successful feeding is necessary not only for physical survival but is also tied in with the infant's general development.

### DSM-IV and the DC: 0-3R classification systems

DSM-IV-TR (American Psychiatric Association, 2000) defines "feeding and eating disorders of infancy or early childhood" as a persistent failure to eat adequately resulting in significant failure to gain weight or significant loss of weight over at least one month, and the disturbance is not due to an associated gastrointestinal or other general medical condition. This definition however is limited as it does not include the subcategories or groupings which are evident when working with very young children who exhibit faltering weight.

The *Diagnostic Classification: Zero to Three Revised Edition (DC0-3R)* (Zero to Three, 2005) re-dresses this problem and makes use of the categories originally described by Chatoor (2002). According to DC0-3R, the diagnosis of *feeding behaviour disorder* should be considered when an infant or toddler has difficulty in establishing regular feeding patterns. As has been already stated, the intake of food at this early stage of life is not an isolated activity but part and parcel of the relationship that exists between the caregiver and the baby. Four stages of feeding behaviour disorder are described – these can become evident during specific developmental phases from the first weeks of life until toddlerhood:

- *Feeding disorder of state regulation.* Difficulty with feeding becomes evident during the neonatal period. Young infants must reach a state of calm alertness in order to feed successfully. Vulnerable infants may have difficulty in reaching this state of calm alertness – an attuned caregiver will be able to help her infant reach and maintain an optimal state for feeding. However if the caregiver is overwhelmed or depressed, she may have difficulty in helping her child attain this state of calm alertness.
- *Feeding disorder of caregiver-infant reciprocity.* Between 2 and 6 months of age the infant affectively engages with the caregiver. Reciprocal vocalizations, eye contact and physical closeness are the hallmarks of this phase, which Daniel Stern has called the "most exclusively social period of life" (Stern, 1985). It is thus to be expected that if the caregiver is unable to respond to the infant's cues, feeding may become affected. According to Chatoor (2002), these infants could be called "neglected" in that their mothers often suffer from psychiatric conditions, such as affective illnesses and substance abuse. Because of the turmoil in their minds, they are unable to be sufficiently attuned to the cues of their infants. However, the association of serious

Failure to thrive can be regarded as a descriptive umbrella for infants or toddlers who have difficulty in establishing regular feeding patterns and do not gain the expected weight.



Photo: Kent Page, UNICEF, DRC, 2003.

mental disorders with feeding disorder of caregiver-infant reciprocity may be more applicable to high income countries. In low to middle income countries, mothers' disturbance is often a more reactive one – reactive to very real stressful life events they have to contend with on a daily basis. These hardships are the cause of preoccupation and depressive affect which in turn may account for a lack of sensitivity to her child's cues and thus giving rise to a feeding disorder of reciprocity. It does not necessarily imply neglect or serious mental disturbance in the mother.

- *Infantile Anorexia.* This disorder becomes apparent between the ages of 6 months and 3 years. Chatoor (2002) links it to difficulties in the developmental phase of separation-individuation, as described by Margaret Mahler (1972). If the infant's cues have not been understood and bids for comfort have been responded to by feeding, the infant confuses hunger with emotional experiences and learns to eat or not to eat in response to negative feelings. Eating can then become a battleground resulting in feeding being externally regulated by the parents. This condition causes enormous anxiety in parents who may resort to extreme measures in order to coax their child into eating.
- *Sensory food aversions.* These become apparent when the infant transitions from baby food to table food. These children are very aware of various sensory stimuli and may respond to the taste, texture, smell and appearance of certain foods. They may show aversive reactions when specific foods are placed in their mouths and are generally reluctant to try out new foods, often resulting in a restricted diet.

*Feeding disorder associated with concurrent medical condition and feeding disorder associated with insults to the gastrointestinal tract* will not be dealt with here as they are not developmentally based and can thus be seen at any age.

## FAILURE TO THRIVE, ATTACHMENT AND MATERNAL SENSITIVITY

DSM-III (American Psychiatric Association, 1980) included *growth failure* under the diagnosis of *reactive attachment disorder*; however, by the time DSM-III-R (American Psychiatric Association) appeared in 1987, the link between failure to thrive and reactive attachment disorder was eliminated (Boris & Zeanah, 2005). Subsequent research has shown that most children with failure to thrive do not meet criteria for reactive attachment disorder. Irene Chatoor and colleagues (1998) came to the conclusion that feeding problems and growth deficiencies can occur within the context organized and secure attachment relationships. However, a broad link between failure to thrive and the relationship between mother and baby can readily be made, even if the criteria for attachment disorder are not met.

The attachment relationship is built to a large degree on the ability of the mother to be attuned to her child. From her Uganda study Mary Ainsworth formulated the concept of maternal sensitivity to infant signals, which she correlated with later attachment security (Bretherton, 1992). Mothers who are depressed or preoccupied are likely to be less available to respond to their infants promptly and appropriately (Patel et al, 2004). This lack of sensitivity can be manifest in the feeding situation – which during the first year of life is the mother's main task and the infant's main physical need. What is then needed is for mothers to be made aware of this link and to help them become responsive to their babies in the daily feeding situation.

### RESPONSIVE FEEDING

Nutrition and primary health care programmes place emphasis on concrete feeding practises and on the actual diet given (Bourne et al , 2007; Bowley et al, 2007; Cattaneo et al, 2008), often with no mention of the fact that feeding in young children is embedded in the relationship with the care-giver. However it is encouraging to note that over the last decade there has been an increasing awareness of the need a child has for a responsive care-giver, also in the feeding situation. Thus the concept of *responsive feeding* has been developed and is being

#### **A child rearing context in Mozambique: *Madzawde***

Once born a baby was considered to have *madzawde* - during this period the mother had to breastfeed her child for 2 years and a symbiotic relationship between mother and infant was unconditionally guaranteed by this state of *madzawde*. The mother used the breast for comfort, the child was carried on the back and she would sleep with the child. This provided an opportunity of optimal physical and psychological care during the early phase of life. Two years after the birth of the baby the parents performed a *madzawde* ritual which marked the point of separation between mother and child and allowed for the re-establishment of the marital relationship. If this ritual was not performed according to the custom a set of physical symptoms could ensue which would affect the child and could even lead to death. This phase and ritual is rooted in the deep cultural knowledge of what a child needs in the first years of life and has been transmitted from one generation to the next. However, the war experiences in this region disrupted the ability of parents to carry out this ritual and it is postulated that the etiology of the Protein-Energy-Malnutrition subsequently seen in this area is elated not so much to lack of food, but with the disorganization of *madzawde* (Igreja, 2003).

incorporated in the scientific literature as well as nutrition programming (Bentley et al, 2011).

Parents and caregivers vary in the way they feed their children – this depends not only on the socio-economic context but also the cultural milieu in which the child is being raised. However, generally speaking, positive verbalizations and attentive mothers are associated with greater acceptance of food and better growth. While breastfeeding is the norm in most non-western cultures, times of weaning can be marked by specific rituals, which, if disturbed can lead to faltering weight (see Box in Page 5).

When planning nutritional intervention programmes for young children, simple and basic messages need to be given, messages which are easily conveyed and which make sense across different cultural settings. Black and Aboud (2011) conceptualized a four-step process between caregiver and child that reflects reciprocity and mutuality and is at the heart of responsive feeding:

1. The caregiver creates a context which promotes interaction – this would include having a routine, a structure, expectations and a positive emotional atmosphere.
2. The child responds and gives their signals to the caregiver.
3. The caregiver in turn responds promptly in a manner that is supportive, contingent and tailored to the child's developmental abilities and needs.
4. The child will then experience a predictable response.

While the above steps are clear and, on the face of it, easy to implement, much depends on the caregiver's ability to be attuned to the child and to be able to respond contingently. The third step in the above sequence is the one most dependent on, and reflective of the caregiver's state of mind. Chronic lack of resources, which includes not only material but also the lack of supportive relationships, makes people more vulnerable to additional stress, which contributes to further resource loss (Hobfoll, 2001). In developing or low income countries this chronic lack of resources is more prevalent. It is thus not surprising that growth stunting is a significant link in the chain of events that lead to ultimate poor educational outcomes for children in the developing world (Grantham-McGregor et al, 2007).

Concepts such as *responsive feeding* are helpful in articulating the possible mechanisms that are at play in the feeding situation. However it must be remembered that most parents are able to keep their infants alive and feed them well without having been taught how to do it. It is knowledge that has been passed on through the generations and, whatever the methods used, it has worked, otherwise that particular group of humans would not have survived. Daniel Stern's (2002) words ring true: "*A mother's caregiving repertoire need not be taught, in fact cannot be taught, but it can be disinhibited.*"

The question then is how can a mother, father or other caregiver be *disinhibited* so as to become a responsive feeder of her baby? And, if we step further back, how do we identify caregivers who are struggling? Given that there might be millions of such children in developing countries, how do we find them and their parents? One possible point of entry will be put forward here.

## PRIMARY HEALTH CARE SETTING FOR INFANTS IN A DEVELOPING COUNTRY

It is usual practice that all infants and toddlers are weighed on their scheduled immunization clinic visits. Growth monitoring has been used as a screening tool to identify vulnerable children during these visits. The child health chart used in South Africa contains a graph which incorporates the weight for age of the child at every clinic visit. Children who deviate from their trajectory are considered to be at risk and are referred for nutritional support. Clinical experience has shown that faltering weight can be associated with a variety of socio-emotional factors and can be a useful entry point for mental health practitioners.

If mental health services are available, these children and their caregivers are also referred to an infant mental health practitioner. It would be the task of this practitioner to ascertain whether factors relating to the child's socio-emotional development could be contributing to the faltering weight. It must be noted that for many caregivers anywhere, let alone in developing countries, the notion of an infant being affected by psychological factors such as family conflict or maternal depression is novel and care has to be taken to introduce this possibility in a gentle and understandable way (Berg, 2007). The following steps are guidelines which are useful when meeting a mother and an infant with faltering weight in a primary health care setting.

### Background information of family and child

- *The mother's trust has to be gained.* She may come from a setting where she has been blamed for her child's poor weight gain and thus may be angry or closed in her attitude to health professionals. Trust is established by having a non-judgmental attitude and giving a simple explanation about the finding that often children's problems with feeding and gaining weight have to do with factors other than provision of food. Such factors are mother's emotional problems caused by difficulties within families, stressful life events and the like. Usually this makes sense to the caregivers and they are willing to talk about their lives. In addition, confidentiality needs to be stressed. Most

The toddler NB was referred at the age of 14 months with the problem of faltering weight, which started when she was 3 months of age. While the history was taken in terms of the family and day care arrangements, it was noted that NB was very hesitant in approaching the biscuit that had been placed in front of her. She took a long time to approach it and, once she had it in her hand, examined it with great care. Only then did she put it in her mouth and started chewing on it. This observation of long hesitancy and careful examination made the health care provider ask more details about her weaning. This turned out to have been a traumatic time for mother and NB who, at the age of 3 months, was not ready to be taken off the breast – for at least one month mother battled to get her to accept the bottle; mother had no choice as she had to return to work.

NB's sensitivity and temperament was explained to mother who agreed with the observations. When she returned 2 weeks later her weight had increased from 8.3kg to 9.1 kg and mother spontaneously said that she was happy that she had been referred to us.

This simple case vignette illustrates how much information can be gleaned by observing the infant and what relief can be provided to the mother that she and her child can be understood and not judged.



Click on the picture to access the NICE clinical guideline Routine Postnatal Care of Women and their Babies.



### Faltering weight in primary health care

The University of Cape Town Parent-Infant Mental Health Service is based at the local children's hospital and as part of its outreach programme provides a clinical service to a large township on the outskirts of the city. A child psychiatrist, together with a community counsellor who also acts as interpreter and cultural broker, visit the same well-baby clinic on a weekly basis. It is known as the "Mlezana Centre".

Infant mental health is a concept that is new and unknown in many communities. Even though it is central, mental health as such is not high on the list of priorities that have to be dealt with in these communities, which are struggling to cope with the daily tasks around survival. Mental health in infants is even more foreign. A way had to be found whereby at risk mother-infant dyads could be identified

and referred. It also had to be done in such a way as to not frighten or alienate mothers who might experience such a referral to an outside doctor in a negative or threatening way.

Over time it became evident that faltering weight could constitute a sign that all was not well, and that this was not necessarily due to food insecurity, but due to maternal inhibition. Infant weight is recorded at each visit and plotted on the "Growth monitoring chart". In many clinics supplementary food is given in cases where growth has been unsatisfactory. However, despite this, many babies fail to respond, underlining the point made earlier that feeding hinges on the relationship between mother and infant. The centre's mission statement can be seen in page 9.

mothers come from tight communities where there is much observation and gossip, which results in many not feeling safe to openly discuss their concerns.

- *Information about the family constellation.* Relevant information here is the whereabouts of the father of the baby and the presence or absence of the maternal grandmother. Clinical experience attests to the fact that frequently mothers harbour negative feelings and thoughts towards the father of the baby; this may play itself out in the mother rejecting the infant because of the conscious or unconscious association of her child with its father. The support of the maternal grandmother is crucial, particularly with very young mothers. Traditionally, maternal grandmothers perform central advice giving roles and when this is disrupted for whatever reason, the young woman feels abandoned, both physically and emotionally.
- The third task is to look closely at *the weight trajectory* of the baby and to note when the weight dropped. Enquiries can then be made as to changes



## The MDLEZANA CENTRE MISSION STATEMENT

**Molweni BooMama!**



We are the team from the Mdlezana Centre and would like to talk to you about your babies. While most other people talk about the healthy body of the babies, we also talk about the happiness of you and your baby.



Babies do not just need food, but they need love – this is not always so easy to give, especially when you are feeling heart-sore, upset or angry. Sometimes we feel that something is just not right, and then we cannot enjoy our children.



You must know that even new-born babies are able to hear and see. They pick up from the environment far more than we ever thought they would. If the mother is unhappy, she cannot smile at her baby when the baby is looking at her. If the mother is angry, she will not talk to her baby. So, it can happen that the baby too becomes sad, because it is not being looked at and spoken to the way it needs to. A sad baby will not eat properly and then will be behind in his/her development.



We are taking the first 3 years of life very seriously because it is during this time that the foundation is laid down for the future development of the child. Not just whether the child will be happy or unhappy, but whether the child will be able to learn and concentrate in school.



We thus ask you to come to us and talk with us if you feel something is not right between you and your baby. We cannot offer food or employment, but we can offer a listening ear and advice. Whatever you discuss with us is confidential and remains only with us. We have the time and the knowledge to listen to your troubles.

If you are feeling well then your baby will feel well and develop in the way you want it to. Just as you pay attention to your baby's physical needs, like food and immunisation, so you must pay attention to your own and your baby's emotional needs.



or difficulties either within the mother or her family, separations or losses that occurred during that time. It is important to explain to the mother the impact these events could have had on her and her child. The time of weaning needs to be noted as the weight loss often occurs at that time. Prolonged breast feeding may be a sign of difficulty in separation and could affect the acceptance of solid food – it could be the beginning of infantile anorexia.

- A *physical examination* may be necessary if there are dysmorphic features or suggestions of underlying diseases that may affect growth. Things to look for include skin rashes, cleft palate, symptoms of respiratory or cardiac

disease (e.g., cyanosis, tachypnoea), abdominal distension or organomegaly, evaluation of suck-swallow coordination, presence of dysmorphic features suggestive of a genetic disorder, such as Down's syndrome; intellectually disabled children often have feeding problems.

However, the point that is made in this chapter is about the emotional connectedness or dis-connectedness between caregiver and child and that it is this that affects the feeding relationship. The purpose of gathering information and talking about facets of the mother and baby's life is to enable the mother to have a space in which to think, make links and find meaning, and thus to produce a greater awareness of how her mind and her actions impact on her child. It also provides the mother with the only opportunity she may have to share her hardships with an empathetic listener. Most caregivers understand that concrete help in the form of employment, grants, and food cannot be given in such a service and appreciate the fact that there is a safe space in which they can be heard.

### **Assessment of child and caregiver-child interaction**

While the above information is being gathered, note is taken of the manner in which mother gives information, the way in which she handles and holds her child. In particular it is noted how mother interacts with her infant – is she aware of his needs? Is she attuned to what he is doing? This naturalistic observation, as opposed to using formal observation measures, has the advantage that it allows an open-ended approach.

In primary health care settings and in developing countries standardised assessment scales are often difficult to use as they require specialized training and are mostly based on samples from developed countries. The *parent-infant relationship* can be rated according to the Parent-Infant Relationship Global Assessment Scale (PIR-GAS) of DM0-3R (Appendix B.2.2). The *emotional and social functioning of the child* can be assessed using the Description of Capacities for Emotional and Social Functioning of the Zero to Three System (2005) (Appendix B.2.3).

Besides these naturalistic observations and assessments, there is one technique which may be particularly useful in a resource-poor setting. As Winnicott used the spatula game in order to assess the infant's level of anxiety, so a *biscuit* can be used in order to observe the infant more closely. The biscuit is placed within reach of the infant and a close observation is made as to how the infant approaches this new object. Is there curiosity to feel, to mouth it? Is there a long period of hesitation or does the infant grab it with confidence and spontaneity? Does the infant show interest in it at all? Observing the use of the biscuit is a technique similar to the observation of the manner in which an older child would engage with a toy and is a useful adjunct to the overall assessment of the infant. A baby who grabs the biscuit with confidence, who explores it with his mouth and who can play with it, is of less concern than an infant who barely notices the new object or who is too inhibited to venture forth and take hold of it. That infant may be physically not well, but it may also mean that the child has become withdrawn, lacking in energy and vitality – either way, this baby requires our attention (Berg, 2010).

### **Working with a cultural counsellor and interpreter**

The majority of health care interactions in a developing country such as South Africa take place in the presence of a third party. This person, who may

A biscuit is useful to observe the infant's behavior more closely.

be a nurse or a lay individual, is expected to serve a function that is well beyond that of a mere language interpreter and should be regarded as a *cultural broker* and co-therapist. If the health care provider comes from a different culture, then it is incumbent to ensure that there is proper translation. It is imperative that cultural norms and values be understood and, if there is a disjunction between western bio-medicine and traditional healing methods, then mediation and explanation is essential. The close working together between the health care provider and the cultural broker ensures that communication is clear and respectful. The primary health care clinic is a system in itself and has its own culture. It is wise to adjust to this where possible and not to alienate staff by making extra demands on their time.

## CONCLUSION

Faltering weight in an infant is a sign that all is not well. This does not necessarily mean that insufficient protein and calorie intake is the cause, nor does it mean that the child is physically ill. Both these factors need obvious exclusion before other influences are considered. This Chapter addresses these other influences of which the most important may be maternal depression and preoccupation which may be the cause of non-responsive feeding of the child.

Offering a space in which confidentiality is assured, and where the mother is able to think and make links is often all that is needed to gain awareness and insight. In this way behaviour changes and the child is provided with a predictable, developmentally appropriate response in the feeding situation. Not only may this lead to a more robust weight gain, but it will also lay the basis for a more secure relationship between infant and caregiver which is the beginning of mental health for all.

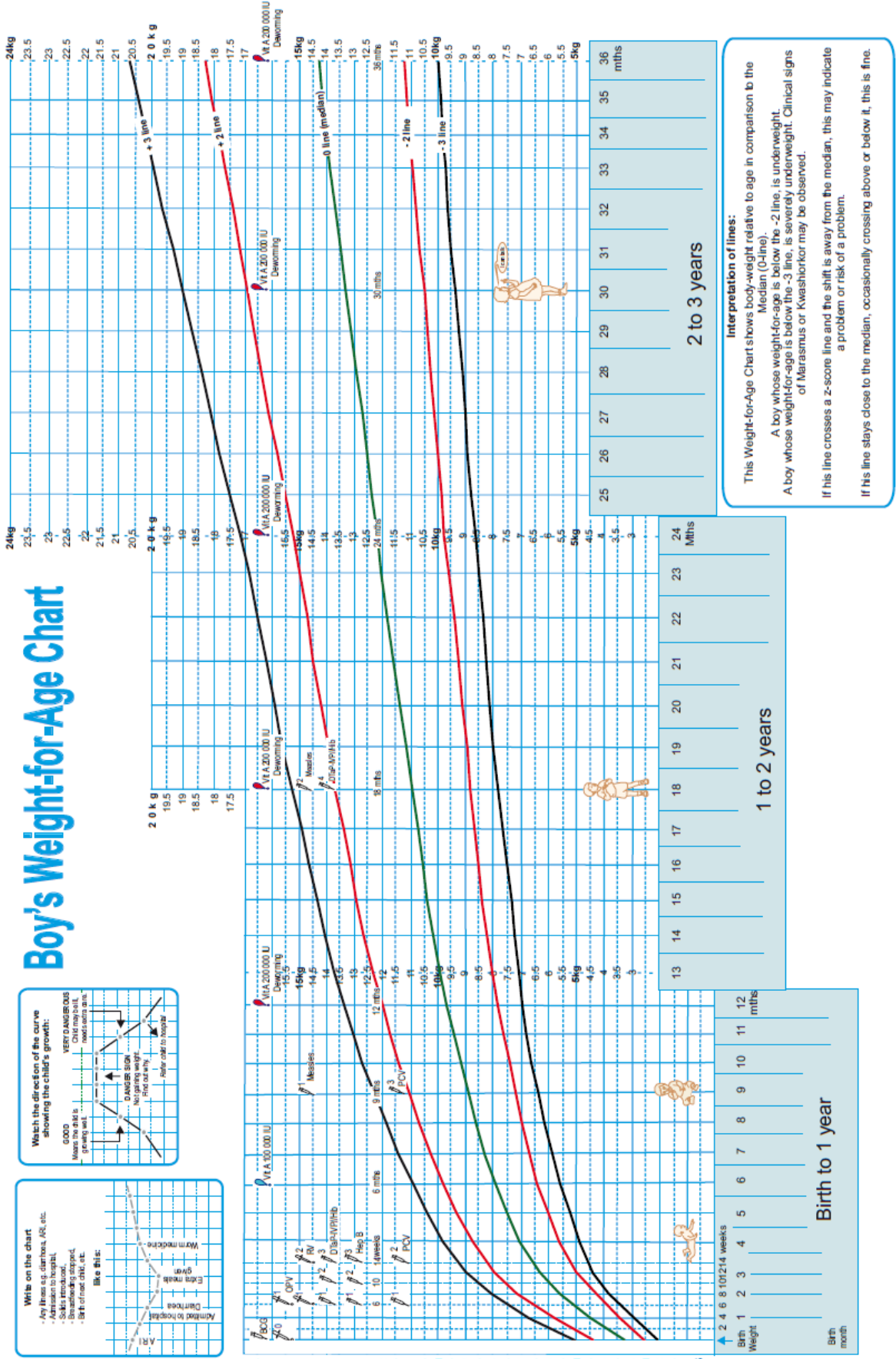
The author working with an interpreter (and cultural broker) in a South African clinic.



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# Appendix B.2.1



## Appendix B.2.2

### The Parent-Infant Relationship Global Assessment Scale

PIR-GAS Ratings according to DC: 0-3 R

**91-100 Well Adapted**

Mutual enjoyment without sustained distress or conflict

**81-90 Adapted**

At times there may be conflict but it does not persist longer than a few days; interactions are mostly reciprocal and synchronous

**71-80 Perturbed**

Some aspect in the overall functioning is less than optimal; child and parent may experience transient distress lasting up to a few weeks. The disturbance is limited to one domain of functioning

**61-70 Significantly Perturbed**

Relationships are strained but still largely adequate. Conflicts are limited to one or two problematic areas. Both parent and child may experience distress and difficulty for a month or more.

**51-60 Distressed**

Conflict may spread across multiple domains of functioning and resolution is difficult. The developmental progress of the dyad seems likely to falter if the pattern does not improve

**41-50 Disturbed**

The relationship is beginning to be overshadowed by problematic features. Dysfunctional patterns are more than transient, and developmental progress may temporarily be disrupted

**31-40 Disordered**

Rigidly maladaptive interactions, conflicted interactions are evident. Developmental progress of the child is likely to be influenced adversely

**21-30 Severely Disordered**

Relationships are severely compromised. Both parent and child are significantly distressed by the relationship itself. Interactive patterns seem to have been in place for a long time. Developmental progress of the child is influenced adversely and the child may lose previously acquired developmental skills

**11-20 Grossly Impaired**

Relationships are dangerously disorganized and the infant is in imminent danger of physical harm

**1-10 Documented maltreatment**

Documented neglect and physical or sexual abuse that is adversely affecting the child's physical and emotional development

# Appendix B.2.3

## Child's Capacities for Emotional and Social Functioning Rating Scale

According to DC: 0-3 R

Emotional and social functioning capacities	Functional rating						
	1	2	3	4	5	6	n/a
Attention and regulation							
Forming relationships/mutual engagement							
Intentional two-way communication							
Complex gestures and problem solving							
Use of symbols to express thoughts/feelings							
Connecting symbols logically/abstract thinking							

### Functional rating

1. Functions at an age-appropriate level under all conditions and with a full range of affect states
2. Functional at an age-appropriate level, but is vulnerable to stress or with a constricted range of affect
3. Functions immaturely (i.e., has the capacity, but not at an age – appropriate level)
4. Functions inconsistently or intermittently unless special structure or sensorimotor support is available
5. Barely evidences this capacity, even with support
6. Has not achieved this