Pediatric Nutrition Protocol of EHA

First Edition 2024

Egyptian Clinical Practice Protocol

in

Pediatric Nutrition

for

Egypt Healthcare Authority

First Edition

2024

Prepared by

Working Group for Development of

Egyptian Clinical Practice Protocols

in

Pediatric Nutrition

for

Egypt Healthcare Authority

Executive Committee

1. ***Prof. Dr. Sanaa Yousef Shabaan:*** **(Head of the Committee)** Professor of Pediatrics and Consultant of Pediatric Clinical Nutrition, Ain Shams University, Board member of Egyptian National Guideline Committee (Egyptian Clinical Practice Guidelines).
2. ***Prof. Dr. Tarik Elsayed Barakat:*** Professor of pediatrics/Gastroenterology, Hepatology and Nutrition, Mansoura University.
3. ***Prof. Dr. Osama Mahmoud Elasheer:*** Professor of pediatrics, Assiut University, Head of Clinical Nutrition Unit, Assiut University Children Hospital**.**
4. ***Dr. Khalil AbdelKhalek Mohamed Ahmed:*** Assist Professor of Pediatrics, Cairo University.
5. ***Dr. Yasmine Gamal El-Gendy:*** Associate professor of pediatrics, Ain Shams University. Member of the Scientific Council of Clinical Nutrition, Ain Shams University, Member of the Higher Committee for Clinical Nutrition in University Hospitals.
6. ***Dr. Mariane Abd El Masseh Fahem: (Moderator of the Committee)*** Pediatric Specialist

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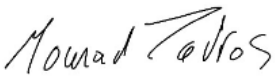
Supervised & Revised By

➢ ***General Doctor/ Mourad Alfy Ramzy Tadros***

- MD, FRCPCH(UK), MRCPI(Dublin)
- Consultant Pediatrician of Egyptian Military Medical Services.
- Professors of Pediatrics Military Medical Academy
- Head of Training Committee of Pediatrics of Egyptian Military Medical Board
- Consultant Pediatrician of the Medical Advisory Council of Egypt Healthcare Authority (EHA).



Reviewed By

1. *Dr. Hala Adel:* Pediatric Consultant, Moderator & coordinator of Medical Advisory Council of Egypt Healthcare Authority (EHA)

2. *Dr. Huda Karam:* Pediatric Specialist, Moderator & coordinator of Medical Advisory Council of Egypt Healthcare Authority (EHA)

Cover Designed & Edited By

➢ ***Mr. Bassam Sayed:*** Technical Officer at Medical Advisory Council of Egypt Healthcare Authority (EHA)

PREFACE

Recently, there is an increasing need to provide programs with accurate competency-based assessments to ensure the delivery of high-quality healthcare services. The aim of developing these Egyptian Clinical Practice Protocols in nutritional Disorders is to unify and standardize the delivery of healthcare to any child at all healthcare facilities.

The main objective of the guidelines is to assist clinicians in recognizing when to suspect nutritional disorders or identifying children at risk and to provide guidance on care steps till referral to a specialized center is feasible.

Despite longer training, increasing specialization, and the use of advanced technologies, avoidable failures still occur frequently in the current healthcare system.

The growing complexity of medicine makes it difficult to provide consistent care unless healthcare providers have access to protocols, checklists, or care paths to follow.

Busy clinicians have all felt the need for a concise, easy-to-use resource at the bedside for evidence-based protocols, or consensus-driven care paths.

In this protocol, we offer thorough reviews of selected topics and evidence-based recommendations on management approaches.

Our goal is to provide an authoritative practical medical resource for pediatricians.

Our aim is that this approach will motivate clinicians to incorporate available evidence into their practice and monitor adherence to recommended practices. We anticipate that practicing pediatricians, fellows, and practitioners will find these protocols beneficial in providing high-quality clinical care to their patients. We welcome feedback and suggestions on how to enhance this resource and maximize its usefulness for healthcare professionals treating patients with nutritional disorders.

Members of the Working Group

For Development of the Egyptian Clinical Practice Guideline

In Pediatric Nutrition

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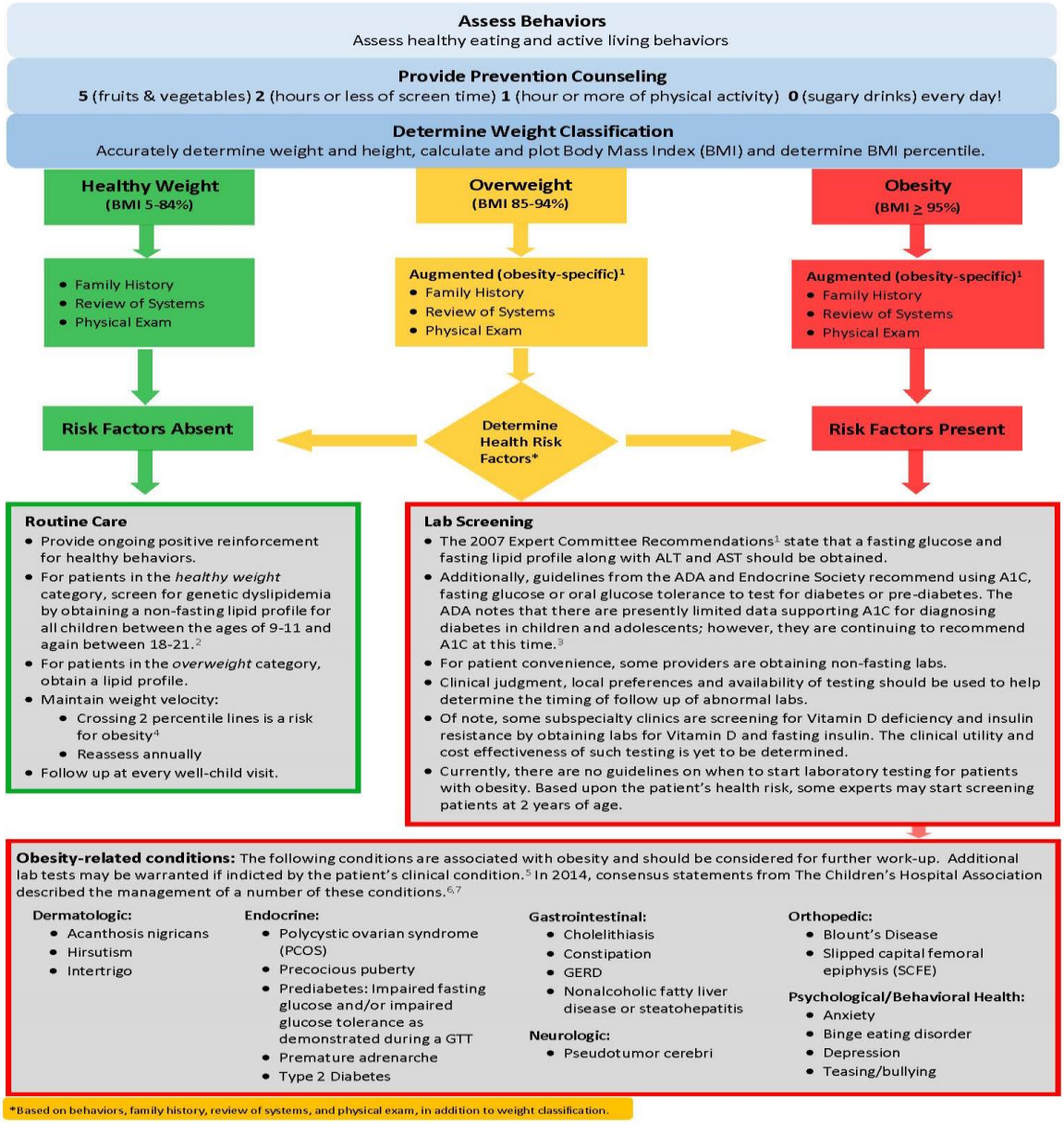
Childhood Obesity

Algorithm for the Assessment and Management of Childhood Obesity in Patients 2 Years and Older:



- **This algorithm is based on the 2007 Expert Committee Recommendations,1 new evidence and promising practices**
- **This algorithm was developed by the American Academy of Pediatrics Institute for Healthy Childhood Weight (Institute).**
- **The Institute serves as a translational engine, moving policy and research from theory into practice in healthcare, communities, and homes.**
- **The Institute gratefully acknowledges the shared commitment and support of its Founding Sponsor, Nestlé.**

Management and Treatment Stages for Patients with Overweight or Obesity:

- Patients should start at the least intensive stage and advance through the stages based upon the response to treatment, age, BMI, health risks and motivation.
- An empathetic and empowering counseling style, such as motivational interviewing, should be employed to support patient and family behavior change.8,9
- Children age 2 – 5 who have obesity should not lose more than 1 pound/month; older children and adolescents with obesity should not lose more than an average of 2 pounds/week.

Stage 1 Prevention Plus

Where/By Whom: Primary Care Office/Primary Care Provider
What: Planned follow-up themed visits (15-20 min) focusing on behaviors that resonate with the patient, family and provider. Consider partnering with dietician, social worker, athletic trainer or physical therapist for added support and counseling.
Goals: Positive behavior change regardless of change in BMI. Weight maintenance or a decrease in BMI velocity.[4]
Follow-up: Tailor to the patient and family motivation. Many experts recommend at least monthly follow-up visits. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 2.

Stage 2 Structured Weight Management

Where/By Whom: Primary Care Office/Primary Care Provider with appropriate training
What: Same intervention as Stage 1 while including more intense support and structure to achieve healthy behavior change.
Goals: Positive behavior change. Weight maintenance or a decrease in BMI velocity.
Follow-up: Every 2 - 4 weeks as determined by the patient, family and physician. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 3.

Stage 3 Comprehensive Multi-disciplinary Intervention

Where/By Whom: Pediatric Weight Management Clinic/Multi-disciplinary Team
What: Increased intensity of behavior changes, frequency of visits, and specialists involved. Structured behavioral modification program, including food and activity monitoring, and development of short-term diet and physical activity goals.
Goals: Positive behavior change. Weight maintenance or a decrease in BMI velocity.
Follow-up: Weekly or at least every 2 – 4 weeks as determined by the patient, family, and physician. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 4.

Stage 4 Tertiary Care Intervention

Where/By Whom: Pediatric Weight Management Center/Providers with expertise in treating childhood obesity
What: Recommended for children with BMI $\geq$ 95% and significant comorbidities if unsuccessful with Stages 1 - 3. Also recommended for children > 99% who have shown no improvement under Stage 3. Intensive diet and activity counseling with consideration of the use of medications and surgery.
Goals: Positive behavior change. Decrease in BMI.
Follow-up: Determine based upon patient's motivation and medical status.

References:

1. Barlow S, Expert Committee. Expert committee recommendations regarding prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. *Pediatrics.* 2007;120(4):S164-S192.

2. US Department of Health and Human Services. Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents: Full report. 2012.

3. American Diabetes Association. Classification and diagnosis of diabetes. Sec.2. In Standards of Medical Care in Diabetes – 2015. Diabetes Care 2015;38(Suppl.1):S8-S16.

4. Taveras EM, Rifas-Shiman SL, Sherry B, et al. Crossing growth percentiles in infancy and risk of obesity in childhood. *Arch Pediatr Adolesc Med.* 2011;165(11):993-998.

5. Copeland K, Silverstein J, Moore K, et al. Management of newly diagnosed type 2 Diabetes Mellitus (T2DM) in children and adolescents. *Pediatrics.* 2013;131(2):364-382.

6. Estrada E, Eneli I, Hampl S, et al. Children's Hospital Association consensus statements for comorbidities of childhood obesity. *Child Obes.* 2014;10(4):304-317.

7. Haemer MA, Grow HM, Fernandez C, et al. Addressing prediabetes in childhood obesity treatment programs: Support from research and current practice. *Child Obes.* 2014;10(4):292-303.

8. Preventing weight bias: Helping without harming in clinical practice. Rudd Center for Food Policy and Obesity website. http://biastoolkit.uconnruddcenter.org/.

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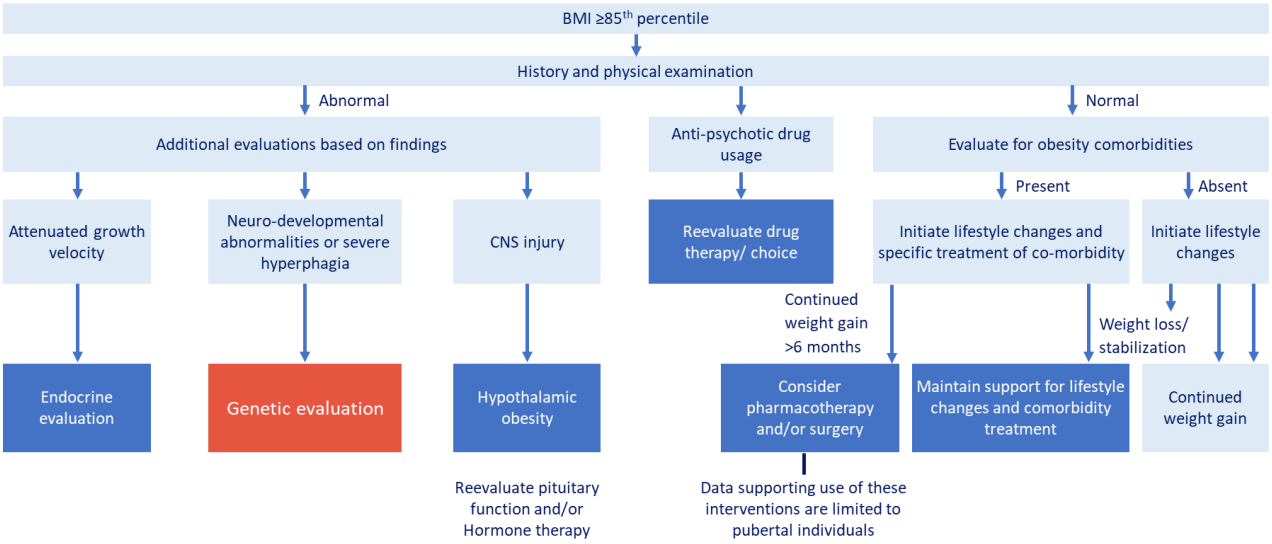
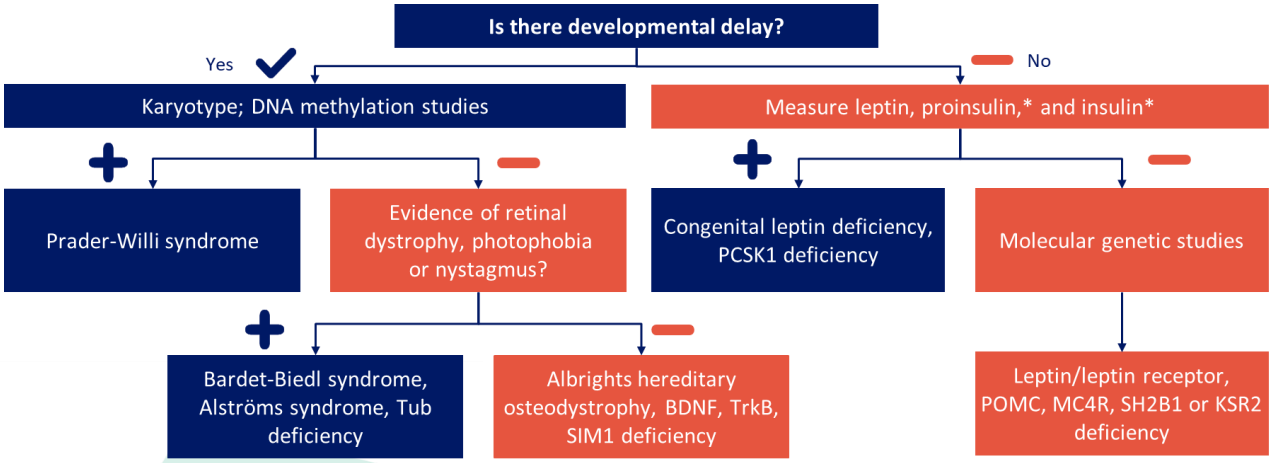
Endocrine Society Guidelines

Diagnosis and Management:



- **BMI, body mass index; CNS, central nervous system**

Genetic Obesity Evaluation:



- **Measure insulin and proinsulin in patients with clinical features of PCSK1 deficiency. BDNF, brain-derived neurotropic factor; KSR2, kinase suppressor of Ras 2; MC4R, melanocortin 4 receptor; PCSK1, prohormone convertase 1; POMC, proopiomelanocortin; SH2B1, Src-homology 2B adaptor protein 1; SIM1, single-minded homolog 1; TrkB, tyrosine receptor kinase B; Tub, tubby gene**

Source:

- **Styne et al. Clin Endocrinol Metab 2017;102:709–757**

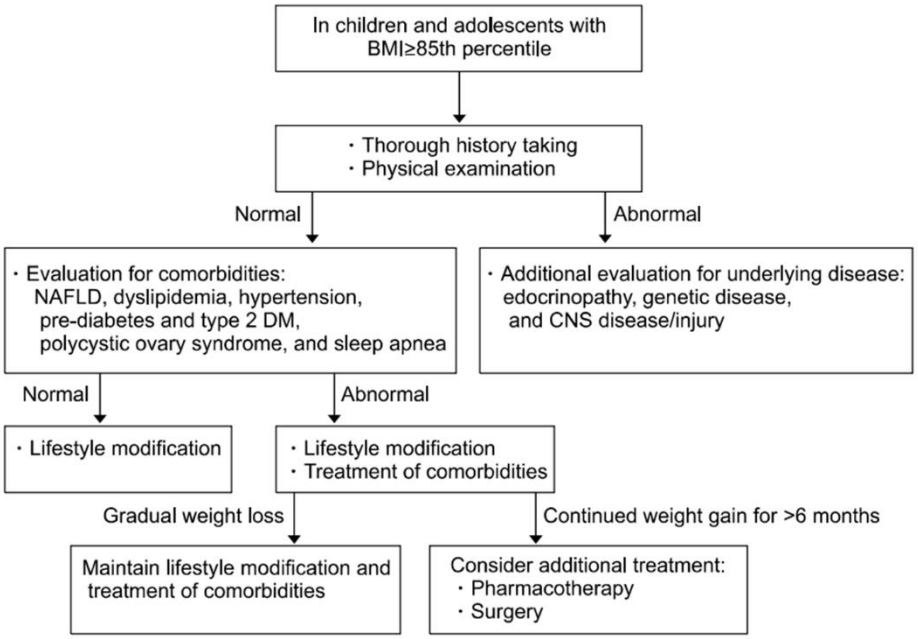


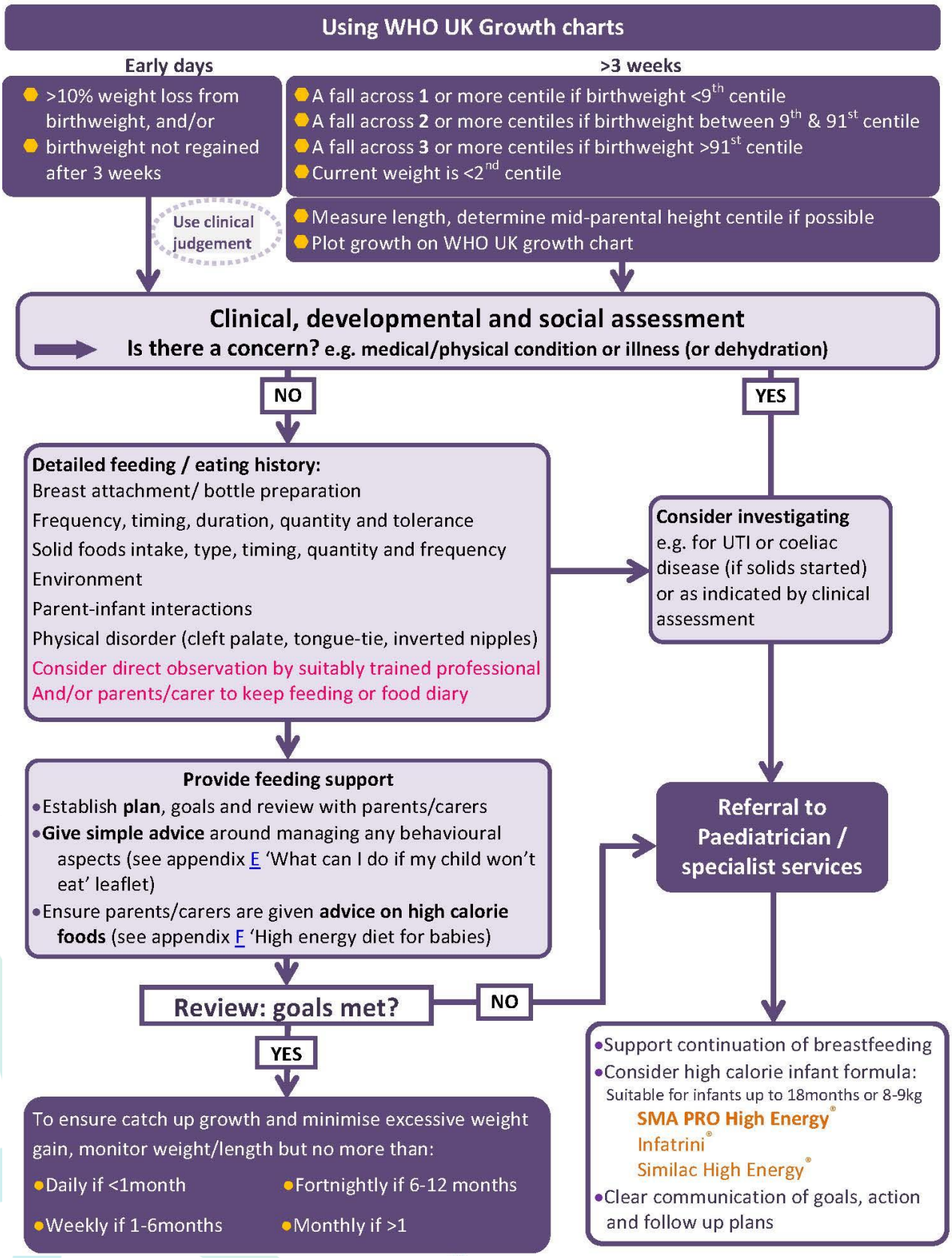
Fig. 1. Stepwise assessment and treatment strategies for overweight and obesity children and adolescents. BMI: body mass index, NAFLD: non-alcoholic fatty liver disease, DM: diabetes mellitus, CNS: central nervous system.

Source:

- **Pediatr Gastroenterol Hepatol Nutr 2019 January 22(1):1-27**

Faltering Growth

Flow Chart for Managing Faltering Growth:



Faltering Growth Additional Notes:

Symptoms and Diagnosis:

- It is not a condition in itself – there are lots of different possible explanations, with feeding problems being the most common.
- UK WHO growth charts should be used to plot weight, length and head circumference.
- The weight / length of an infant need to be measured properly to interpret changes in pattern:
  - ✓ Use only appropriate scales/equipment that are regularly serviced and/or calibrated
  - ✓ Remove clothing and nappies before weighing
  - ✓ Ensure staff is skilled and well-trained
- Pre-term birth, neurodevelopmental concerns and maternal postnatal depression/anxiety are factors associated with faltering growth.
- When a child's growth deviates from the expected rate, it is crucial to identify this deviation early and promptly investigate the underlying causes. e.g. dehydration, acute illness, iron deficiency anaemia, CMPA, Coeliac disease, GORD or a child safeguarding issue (abuse / neglect).
- In the majority of cases, there isn't an underlying medical problem and a baby can be successfully treated at home. However, recognize that a range of factors may contribute to the problem and it may not be possible to identify a clear cause.
- There may be difficulties in the interaction between an infant and the parents or careers that may contribute to the problem.

Treatment:

- **Early days:** provide feeding support as per NICE guideline CG37 "postnatal care up to 8w after birth".
- **Under 6 months:** Check frequency and timing/volume of feeds, as well as breastfeeding and/or bottle preparation technique. An infant's requirements are around 150mls/kg/day and most will need one or more feeds during the night.
- **6 months and over:** Ensure appropriate solids are offered at regular intervals; ask about volume and frequency of milk and solids food. Once a food routine is established, milk intake should be around 500-600mls a day. More than that may compromise appetite for solids.

Review and Discontinuation of Treatment:

- All infants on high energy formula will need growth (weight and length) monitored to ensure catch up growth occurs but also prevent excessive weight gain.
- Pediatric Dietitians or Pediatricians should advise if/when the formula should be stopped.

Formula	Presentation	Cost*	Cost / 100Kcal	Details
SMA Pro High Energy (SMA)	200mls	£1.96	£0.99	100Kcal /100mls From birth up to 8kg
Similac High Energy® (Abbott Nutrition)	60 / 200mls	£0.69 / 2.29	£1.14	
Infatrini® (Nutricia)	125 / 200mls	£1.51 / 2.40	£1.21	
Infatrini Peptisorb® (Nutricia)	200mls	£3.67	£1.84	+ malabsorption

*MIMS Feb 2018

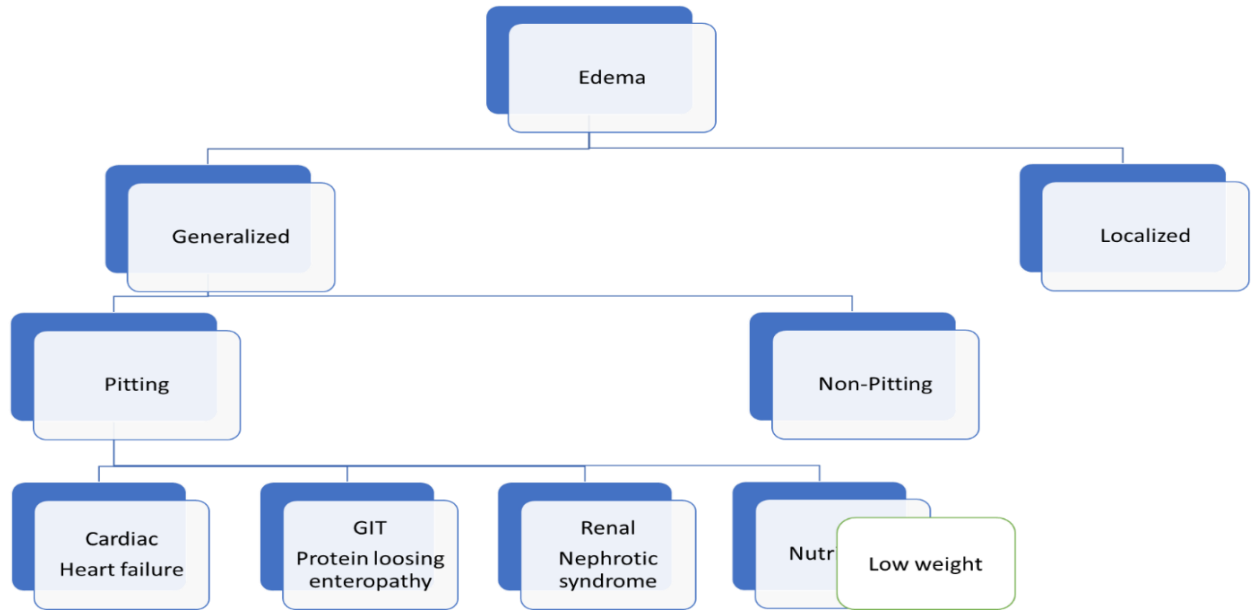
"We don't have SMA available in our market, resource junior (Nestle) is available in our market."

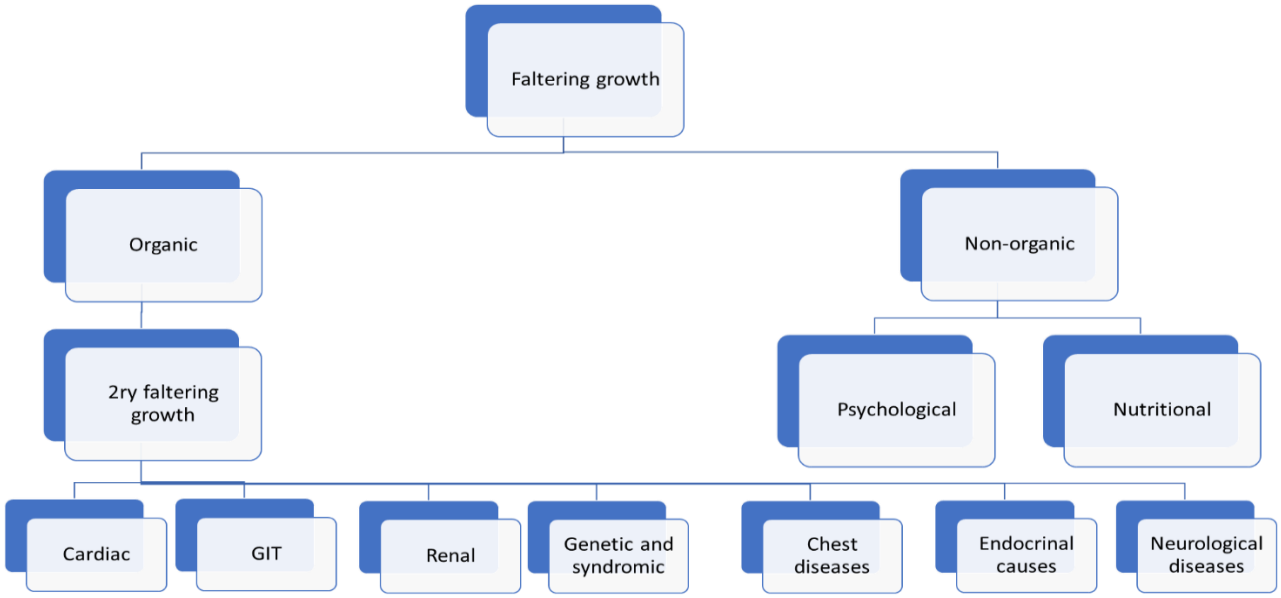
Useful resources for parents and health professionals:

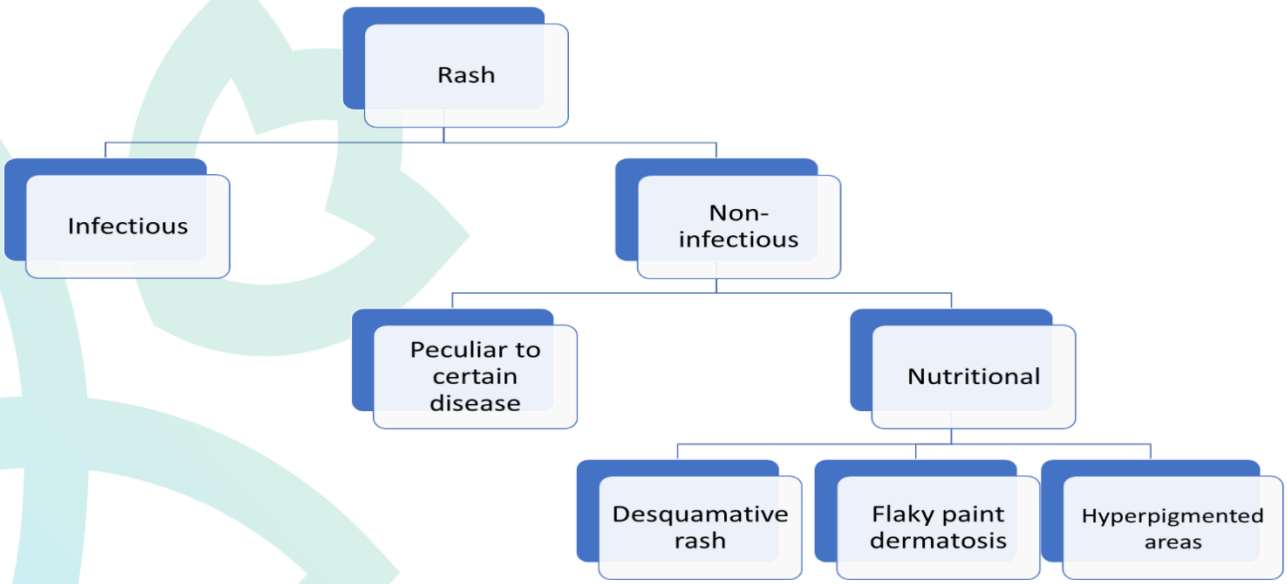
- **NHS choice website: www.nhs.uk/Conditions/pregnancy-and-baby/Pages/help-baby-enjoyfoods. aspx**
- **Royal college of Pediatric and Child health website for WHO growth charts and tutorial: www.rcpch.ac.uk/growthcharts**

SYMPTOMS BASED:

	Nutritional	GIT(protein losing enteropathy or malabsorbtion)	renal	cardiac	hepatic	angiodema
history	• Low protein intake in dietetic history	Chronic diarrhea	History of URT infection and morning puffiness	History of cardiac disease	History of liver disease Jaundice Change in stool and urine color	History of trigger e.g. medication
Examination	Anthropomertric measurements below normal Signs of vitamin difficiency	Abdominal distension Anthropomertric measurements below normal Signs of vitamin difficiency	Side effect of steroid therapy in nephrotic syndrome eg cushonoid facies, hairsutism and HTN	Signs of HF eg tachycardia,dysnea and tender hepatomegaly	Ascites Jaundice HSM Bleeding tendency	Urticarial rash
odema	Generalized pitting odema No ascites	Generalized pitting odema	Generalized pitting odema	Generalized pitting odema	Generalized pitting odema	swelling most often affects the: •hands •feet •area around the eyes •lips and tongue •Genitals
investigation	Hypoglycemia Decrease s.albumin and total protein Electoryte disturbance	Specific investigation according to the cause	▪ Decrease s. albumin ▪ albuminuria	ECHO	Elevated bilirubin Prolonged INR Decrease s. albumin PAUS	A very low level of C1 esterase inhibitor would suggest you have an inherited problem

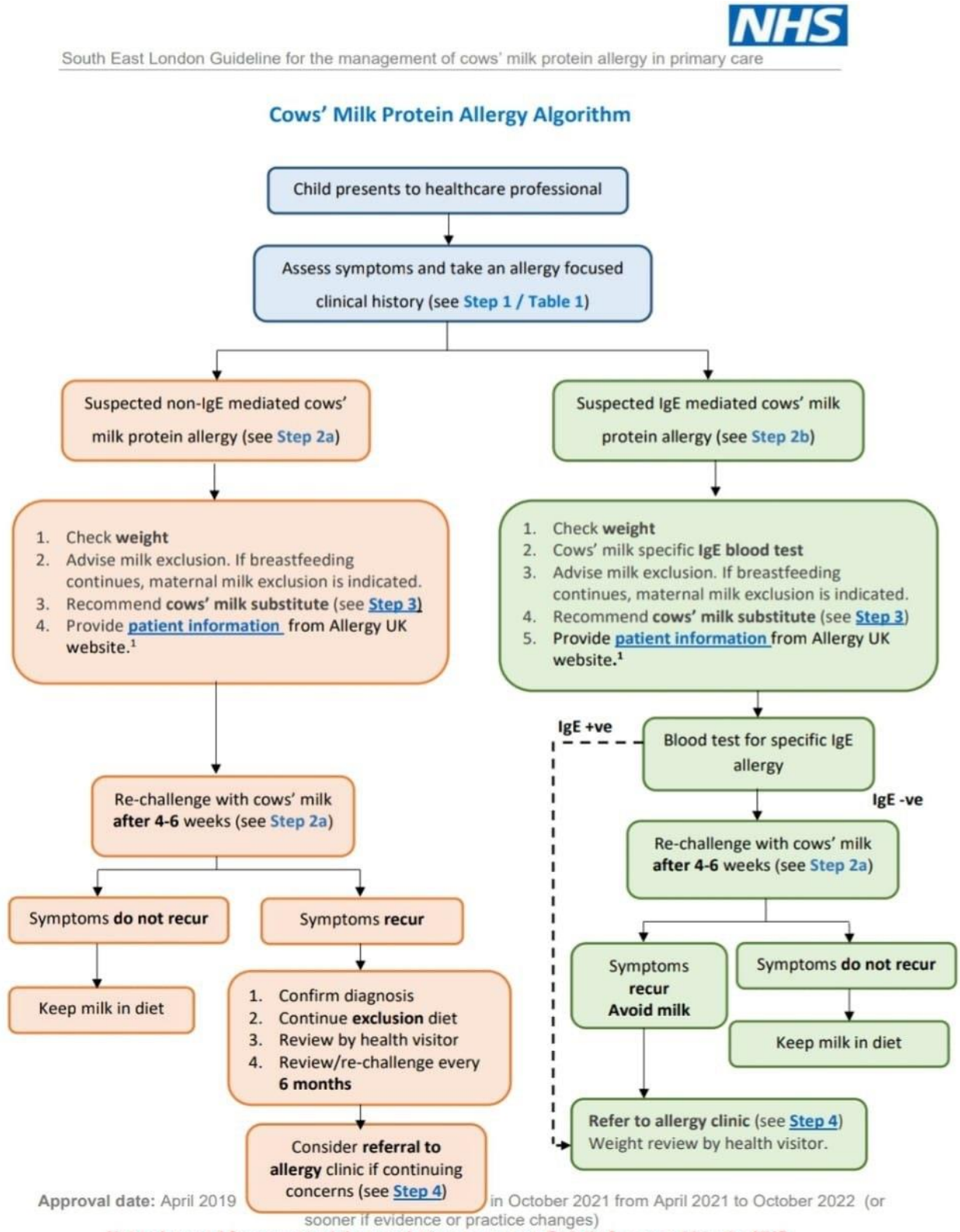

Edema
Generalized
Localized
Pitting
Non-Pitting
Cardiac
Heart failure
GIT
Protein loosing enteropathy
Renal
Nephrotic syndrome
Nutr
Low weight


Faltering growth
Organic
Non-organic
2ry faltering growth
Psychological
Nutritional
Cardiac
GIT
Renal
Genetic and syndromic
Chest diseases
Endocrinal causes
Neurological diseases


Rash
Infectious
Non-infectious
Peculiar to certain disease
Nutritional
Desquamative rash
Flaky paint dermatosis
Hyperpigmented areas

South East London Guideline for the Management of cows' milk protein allergy in Primary Care

Cows' Milk Protein Allergy Algorithm:



Introduction:

- The management of infants and children with suspected cows' milk protein allergy (CMPA) is complex. This guideline aims at supporting doctors and health visitors in primary care, for the management of children with cows' milk protein allergy, at the point at which they present. Cows' milk protein allergy is an immune-mediated allergic response to proteins in milk. It includes referral guidance for children with cows' milk protein allergy to pediatric dietetic and allergy clinics.
- This guideline is consistent with the international Milk Allergy in Primary Care iMAP guidelines2 and provides recommendation on the presentation, diagnosis and management of cows' milk protein allergy in primary care.

Background:

- Cows' milk protein allergy typically presents in the first year of life and affects approximately 2-3% of infants.
- Most children outgrow immunoglobulin E (IgE) mediated allergy by 5-6 years, non-IgE mediated CMPA is usually outgrown sooner.
- Children can continue to achieve tolerance well into adolescence.
- Milk allergy is more likely to persist in individuals with multiple food allergies (e.g. egg /peanut/fish/wheat…. allergy) and/or concomitant asthma and allergic rhinitis.

IgE and non IgE mediated cows' milk protein allergy:

- The immune response to cows' milk protein can be subdivided into IgE-mediated allergy and non-IgE-mediated allergy (previously cows' milk intolerance) **see NICE CG1164.**

Table 1: Signs and Symptoms of Cows' Milk Protein Allergy

Presentation	**Non-IgE-mediated[4] (previously cows' milk intolerance)**		**IgE-mediated**	
	Delayed reaction presenting several hours and up to 72 hours after milk ingestion.		Acute allergic reaction usually occurring minutes after milk ingestion, with the majority within 1 hour (can occur up to 2 hours).	
Skin	• Pruritus • Erythema • Significant atopic eczema		• Pruritus • Erythema • Acute urticaria • Acute angioedema • Acute flare of atopic eczema	
Gastrointestinal	• Infantile colic • Vomiting • Gastro-oesophageal reflux disease (GORD) with poor response to anti-reflux medication (see appendix 3) • Food refusal/aversion	• Loose/frequent stools • Perianal redness • Constipation • Faltering growth • Abdominal discomfort • Blood and/or mucus in stools • Pallor and tiredness	• Angioedema of the lips, tongue and palate • Extreme colic • Vomiting • Diarrhoea	
Respiratory *(usually in combination with other symptoms)*	• Rhinorrhoea • Nasal congestion		• Rhinorrhoea • Sneezing • Nasal congestion • Anaphylactic reaction	• Cough • Wheezing • Shortness of breath

STEP 1 – Assess likelihood of IgE or non-IgE-mediated allergy:

- Feeding history – check the source of cows' milk e.g. is the infant milk fed (breast fed/formula fed) or weaned onto solids.
- Ask about **age** of first onset, **speed** of onset / **severity** and **reproducibility** following milk ingestion. Also ask about previous management including medication use and response.
- An **allergy-focused clinical history** is the cornerstone of the diagnosis. A history of eczema, asthma, allergic rhinitis or food allergy is more likely in IgE-mediated food allergy.
- A family history of atopic disease in parents or siblings makes IgE-mediated allergy more likely.
- Anthropometric measurements to assess growth.
- Examine the child to check for signs of allergy related comorbidities e.g. atopic eczema.
- Discourage parents / careers from seeking advice from unregulated alternative allergy practitioners.

STEP 2a – Confirming diagnosis and manage Non-IgE-mediated cows' milk protein allergy:

1.Advise a trial elimination of cows' milk for a period of 4-6 weeks:

- Verbal and written advice should be provided on the avoidance of food containing cows' milk protein. Patient information sheets are available from Allergy UK, British Dietetic Association BDA and NHS.
- If symptoms do not improve (and exclusion has been adhered to) then it is not CMPA, consider alternative diagnosis.
- If symptoms improve on exclusion, then CMPA is likely but a re-challenge is essential to confirm diagnosis (especially if other treatment options have been started concurrently).
- See step 3 for exclusion and replacement advice; consider both maternal & infant diet (milks and solids) as appropriate.
- Consider additional soya exclusion if remains symptomatic, seek advice from pediatric dietician.

2.Re-challenge to confirm the diagnosis of Non-IgE-mediated cows' milk protein allergy (after 4-6-week exclusion):

- Explain to parents why the reintroduction phase is essential.
- If the infant is exclusively breastfed introduce cows' milk back into the diet of the mother.
- If the child is formula or mixed-fed reintroduce cows' milk formula. The iMAP guide on re-challenging with CMPA gives parents a structured approach to formula reintroduction.
- If the child has been weaned onto solid foods, then reintroduce cows' milk into the diet and / or cows' milk-based formula.
- If symptoms do not return then the diagnosis is not CMPA, or the CMPA has been outgrown.
- If symptoms return with the challenge, then return the child to a strict CMPA free diet and see next step.

3.Ongoing management of non IgE-mediated cows' milk protein allergy:

- Strict avoidance of cows' milk protein for at least 6 months or until the child is 9-12 months old.
- Evaluate the child every 6 months. Monitor the child's weight to assess growth, nutrition and assess whether they have developed any tolerance to cows' milk protein with a challenge of cows' milk protein. If symptoms recur, continue cows' milk avoidance management.
- Seek advice from a pediatric dietitian for guidance on nutritional adequacy and re-introduction of milk protein.

STEP 2b – Manage IgE-mediated cows' milk protein allergy:

- Consider a cows' milk specific IgE antibody test, only after taking an allergy focused clinical history.
- If negative, consider management in line with non-IgE-mediated symptoms or an alternative diagnosis, (see step 2a).
- A positive result is ≥0.35kuA/L and along with a positive clinical history would support the diagnosis of IgE-mediated cows' milk protein allergy. Also check specific IgE to egg and peanut in children with resistant eczema.
- Advise total exclusion of cows' milk from diet.
- Recommend cows' milk replacement. **Extensively Hydrolysed Formula (eHF) as first-line** for mild to moderate IgE-mediated CMPA. See step 3.
- Consider **Amino Acid Formula (AAF) if severe CMPA,** (see step 3).
- Provide the parents/carers with appropriate information on what cows' milk protein allergy is, and the potential risks of a severe allergic reaction.
- Information sheets from Allergy UK12 and BDA13 websites.
- Discuss the diagnostic process and direct the parents/carers to relevant support groups (Allergy UK, Anaphylaxis Campaign14).
- Provide a management plan to parent/carers. Templates for management plans are available on the **British Society for Allergy and Clinical Immunology website.**
- **Infants with IgE mediated cows' milk protein allergy should be referred to the pediatric allergy clinic following recommendation of an appropriate milk substitute.**

STEP 3 – Advise about cows' milk free diet:

Table 2: General recommendations for milk free feeds

Exclusively breastfed	Formula (+/- Breastmilk)	Taking solids
• **Recommend exclusive breastfeeding for 26 weeks (6 months)** • If an exclusively breastfed child is symptomatic, advise mother to exclude cows' milk protein from her diet. A maternal milk substitute should be advised e.g. soya milk. Refer to a dietitian if appropriate. • Women on a milk free diet should take a daily supplement of 1000mg calcium and 10mcg Vitamin D.	• Advise on the replacement of cows' milk-based formulas with an extensively hydrolysed formulas (eHF) as first line. • For mixed fed infants, if symptoms occur only with the introduction of top-up formula feeds, replace these with eHF top-ups. The mother can continue to consume foods containing cows' milk protein (CMPA). • For mixed feeding refer mother to local specialist/additional breastfeeding support for support with return to exclusive breastfeeding or increased breastmilk if this is mother's choice.	• Advise parents/carers to exclude cows' milk protein from the child's diet. • Advise on a suitable milk alternative. • **OTC soya formula can be recommended for infants > 6 months,** but if this is not tolerated (suggesting a soya allergy/a soya intolerance) a milk-free formula should be prescribed. Infants who have been prescribed formula < 6 months can continue this after 6 months of age. • Introduce milk free **solids no earlier than 17 weeks.**

❖ Prescribing Advice of formula milk:

- Prescribe only 2-3 tins initially until compliance/tolerance is established to avoid waste. Review at 1-2 weeks or issue a second prescription with enough to last 1 month if the baby tolerates this milk formula, review at 3-4 weeks.

Table 3: Suggested monthly amounts (vary with large size and stage of weaning)

Age	General advice	Formula quantity
<6 months	Infants under 6 months being exclusively formula fed and drinking 150ml/kg/day of a normal concentration formula.	13 x 400g
6-12 months	Infants 6-12 months requiring less formula as solid food intake increases.	7-13 x 400g
12 months plus	Children over 12 months requiring less formula as solids are the primary source of nutrition.	7 x 400g

- Some children may require larger quantities e.g. faltering growing. Review recent correspondence from the pediatrician or pediatric dietitian.
- Please refer to pediatric dietetic service if there are problems with introduction of solids at this stage.
- Prescribing of hypoallergenic milks is governed by the **Advisory Committee on Borderline Substances (ACBS).** ACBS advice takes the form of its 'recommended list' which is published as Part XV of the Drug Tariff. Endorse prescription for formula feed with **'ACBS'**.

❖ **Please note some key points:**

- **Extensively Hydrolysed Formula (eHF) should be used first-line.** Patients unresponsive or partially responsive to a trial of two different eHFs can be progressed to Amino Acid Formula (AAF). At least 90% of children with proven CMPA should tolerate these feeds.**(e.g, Althera)**
- **AAF should only be prescribed for severe IgE-mediated allergy,** enterocolitis, faltering growth, multiple food allergies, GORD, severe early onset eczema when breastfed, breastfeeding infants still symptomatic on maternal elimination diet or if no improvement after 4 weeks on eHF. Only 10% of infants with CMPA should require management with AAF.
- **Soya based formula can be used first line from 6-12 months, (not to be prescribed).** Soya **should not** be used at all for those under 6 months due to high phyto-oestrogen content.
- Full fat soya milk is suitable for children from 1 year of age after the child's diet is assessed as adequate, **(not to be prescribed)**.
- Although significant advancements have been made in recent years in our understanding of soy properties, substantial gaps in our knowledge still exist; for many reasons, it is still difficult to establish whether soy-based food consumption early in life is safe and beneficial; thus, we recommend that soy drinks should not be used as a substitute for infant formulas or cow's milk in children younger than 24 months. Further additional studies will be needed to clarify the effects of soy on the reproductive system, long-term effects on neurodevelopment, the effects of glyphosate, effects on the microbiome, and, generally, all the long-term consequences of soy. **(Verduci, et al., 2020)**
- Using soy-based formula in the treatment of CMA in infants has long been an area of controversy. Soy formulas have been shown to promote appropriate infant growth patterns, but some studies suggest lower weight gain in infants fed soy formula compared to cow's milk formula. A randomized controlled trial of 170 infants with confirmed CMA reported allergic responses in 10% of infants fed soy formula. Adverse reactions to soy were similar in IgE-mediated and non-IgE–mediated CMA, and reactions were more common in infants younger than 6 months of age.7,12,17 A randomized-order, double-blind test of 50 adult participants (mean age of 34.4 years) comparing 12 different milk alternatives for infants with CMA based on taste, texture, and smell found soy formula to have the highest overall scores, followed by soy and rice hydrolysates. Soy-based formulas are also more affordable than extensively hydrolyzed formulas. Soy-based formula limitations are the unknown effects of phytate and phytoestrogens found in soy and cross-reactivity with CMA, especially in younger infants. **(Kipfer et al., 2021)**

- If child is allergic to soya and cows' milk then refer to a dietitian.
- Alternative plant milk drinks are suitable for children from 2 years of age or from 6 months if used for food preparation (unless advised by a dietician). They must be non-organic in-order to contain **sufficient calcium**. Some alternative calcium fortified, plant-based milk drinks are suitable as a drink from 1 year of age **if advised by a dietitian** once the child's diet has been assessed.
- Children under 5 years of age should not be fed rice milk as it contains arsenic.
- Other mammalian milk proteins (including unmodified cow, sheep, buffalo, donkey, camel, horse, or goats' milk/formula) are not recommended for infants with cows' milk protein allergy. Most are not adequately nutritious to provide the sole food source for infants and there is a risk of allergenic cross-reactivity with cows' milk.
- All children under 5 years of age require vitamin D supplements unless they are taking > 500mls infant formula per day. **See BDA Food Fact Sheet - vitamin D13** and **NHS vitamin D**.
- **Infants on a milk free diet should be weighed 6 weeks after initiation of new feed and then regularly thereafter by the health visitor and their weights plotted in the Growth curves.**
- Information about achieving adequate calcium requirements can be provided from the BDA and NHS. **See BDA food fact Sheet - calcium13** and **NHS calcium.**
- **If symptoms do not improve on an elimination diet, re-introduce cows' milk protein and refer to a pediatrician.**
- **Do not routinely prescribe formula for children over 2 years of age unless recommended by dietitian or pediatrician.**

STEP 4 – When to refer:

Note: Seek advice and guidance via electronic Referral System (eRS) if any uncertainty

Refer to pediatric dietetic service:

- Every child with CMPA should have a dietary/nutritional assessment with a suitably qualified healthcare professional e.g. dietitian, GP or healthcare visitor.
- If there is concern about the nutritional adequacy of the child's diet and faltering growth across 2 centiles on a milk free diet, refer to pediatric dietitian.
- If the mother is having difficulty getting the baby to take a milk free formula.
- If the parents would like support around reintroduction of cows' milk protein.
- Refer breastfeeding mothers for dietetic support (adult) if they wish to remove milk from their own diets and there are additional risk factors or concerns about their nutritional status.
- Referral criteria and access to community/specialist support vary across South East London. Please follow local pathway.

Refer to pediatric allergy service (which includes pediatric allergy dietetic assessment and advice):

❖ **Patients who present with, or develop any of the following symptoms/situations during primary care management:**

- A clinical history strongly suggestive of IgE-mediated cows' milk allergy (with positive or negative allergy tests)
- An acute systemic reaction involving wheezing, difficulty breathing, drowsiness, loss of consciousness
- A severe delayed reaction
- A history of reacting to other foods (multiple food allergies)
- Has or develops asthma (which puts him/her into a higher risk group for having a more severe allergic response to milk following accidental ingestion).
- Faltering growth, especially in combination with any gastro-intestinal symptoms
- If symptoms do not respond to exclusion of cows' milk
- Persisting parental/carer suspicion of food allergy or concern once primary care measures have been tried.

Risk of developing Other Allergies:

- Children with cows' milk protein allergy are more likely to develop other allergies. If an infant is reacting to other food proteins in addition to cows' milk (for example egg) it is vital that this food protein and its derivatives are removed from the diet as well. Children with multiple food allergies should be referred to a pediatric allergy service.
- The risk of nutritional deficiencies is increased when multiple food groups are excluded from the diet. Unnecessary food exclusion should be avoided, and multiple food avoidance should be supervised in a pediatric allergy clinic.

Annex

Appendix 1: Allergy Testing Advice for Children from General Practice

Introduction:

- Allergic diseases are common, affecting up to 40% of British children. Although specialist advice within hospitals is available for difficult cases, many children with straight forward allergies can be managed in general practice.

Taking a History:

- Diagnosis of allergic diseases is primarily made by taking a detailed history of exposure and reactions, and by physical examination. Children from families where other family members also have allergic disease are particularly at risk. On the basis of the history, clues should emerge which can then be confirmed by performing allergy tests.

Allergy Tests:

- The most appropriate tests for diagnosing allergy in general practice are specific IgE tests (RAST tests). These should only be performed to **confirm a suspected diagnosis**. Allergy tests may not be needed in children presenting with non-IgE-mediated cows' milk protein allergy and it does not influence management. Screening, using large panels of tests is inappropriate. Testing should be considered in children aged 2 months and above presenting with allergic conditions.

Allergic Conditions:

- The immunology laboratory can measure specific IgE to an enormous variety of allergens. If the patient presents with a specific allergy, then request IgE to the particular allergen. The following is a list of allergic conditions with their commonly associated allergens. Specific IgE blood tests are available to all these allergens (this is not an exhaustive list):

Allergens	
Food Allergy	Cows' milk, egg white, wheat, soya, peanuts, tree nuts, fish, shellfish, sesame
Atopic eczema	Cows' milk, egg, soya, wheat, house dust mite, cat, dog, tree pollen, grass
Asthma	House dust mite, cat, dog, tree pollen, grass pollen, mould
Seasonal rhinitis/conjunctivitis	Grass pollen, tree pollen, mould
Perennial rhinitis/conjunctivitis	House dust mite, cat, dog
Bee and wasp stings	Bee and wasp venom
Latex allergy	Natural rubber latex

Requesting an allergy test:

- Selection of allergens to be tested should be based on the history of exposure and reactions.
- It will be necessary to limit the number of tests in very small children. to those thought to be the most important. Please specify which individual allergens you would like the child tested for.

Interpreting the test:

- Specific IgE results **(see table 4)** should be read in conjunction with the clinical history. A test result of >0.35 kuA/L indicates sensitisation.
- Higher values are more likely to indicate clinical allergy. **A low level** of specific IgE (grade 1 or 2) may be more significant in younger children (less than 2 years of age), and **an intermediate level** of specific IgE (grade 2 or 3) may be less significant in a child with severe atopic dermatitis or a child who is outgrowing a more severe allergy. Some patients have a positive specific IgE but do not react on exposure to the allergen, whilst others may have a negative specific IgE yet still react to allergen. **Where there is a discrepancy between the clinical history and the specific IgE result, patients should be referred to a pediatric allergy clinic for further evaluation.**

Table 4: Interpreting Test Results

*ImmunoCAP Grade	Level of allergen specific IgE antibody (kuA/L)	Comment
6 – Strong positive	100+	Very high. Refer to patient history.
5 – Strong positive	50-100	Very high. Refer to patient history.
4 – Strong positive	17.5-50	Very high. Refer to patient history.
3 – Positive	3.5-17.5	High. Grades 1-3 vary in significance dependent on allergen. Consider patient history and risk of severe reaction/anaphylaxis.
2 – Positive	0.7-3.5	Moderate
1 – Low, weak positive	0.36-0.7	Low. Grade 1 to inhaled allergens is of doubtful significance. Grade 1 to foods or moulds of greater significance.
0 – Undetectable, negative	0.35	Absent or undetectable.

❖ **A sensitive blood test that measures the concentration of immunoglobulin E (IgE), which is an indicator of allergic sensitisation.**

Appendix 2: Other Milk Related Conditions

1. Cows' Milk Protein Proctocolitis:

- Presents with blood or mucus in the stool of happy, thriving breast fed babies, following ingestion of, or maternal ingestion of milk protein. It improves when cows' milk protein is eliminated from the maternal diet. If mother wishes to introduce formula offer a suitable milk free formula. This usually resolves by a year of age, when normal cows' milk can be re-introduced. This is a non-IgE-mediated cows' milk protein allergy.

2. Lactose Intolerance:

- This is a condition which occurs as a result of a deficiency of the lactase enzyme in the intestine, it is not the same as cows' milk protein allergy. It usually occurs in children who were previously able to tolerate cows' milk. Symptoms occur as a result of lactose malabsorption; abdominal distension, abdominal pain and diarrhoea.

  - **Primary lactose deficiency** occurs in up to 70% of the world population, although it is uncommon in Western Europe. It is due to a decline in activity of the lactase enzyme, which can occur at varying rates, from a few months of age.

  - **Secondary lactose intolerance** is a temporary phenomenon, which results from injury to the gut wall following acute gastroenteritis. This usually resolves within a 2-4 weeks. Treat with a lactose free diet including lactose free milk. For infants under 1-year lactose free milk formula is available OTC. **If exclusively breastfed**, breastfeeding should continue. If **not breastfed** soya formula can be used in children from 6 months onwards. **For infants over 1-year lactose free milk can be purchased over the counter by the parents/carers.**

3. FPIES (Food Protein-Induced Enterocolitis Syndrome):

- FPIES is a rare condition which presents in infants with profuse vomiting, diarrhoea, acidosis and shock, 1-3 hours after ingestion of milk or other food proteins.
  - The child may be assessed for sepsis.
  - It may be associated with a raised white cell count but the child is afebrile and stool samples are clear**.**
  - **FPIES requires hospital referral.**
  - This is a non-IgE-mediated food allergy.

Appendix 3: Gastro-Oesophageal Reflux

GASTRO-OESOPHAGEAL REFLUX

Gastro- oesophageal reflux (GOR) is the passage of gastric contents into the oesophagus. It is a normal physiological process that usually happens after eating in healthy infants, children, young people and adults. **Gastro-oesophageal reflux disease (GORD) occurs when the effects of GOR leads to symptoms severe enough to require medical treatment.**

Symptoms of GORD

Unexplained feeding difficulties (refusing to feed, gagging or choking), vomiting, regurgitation, distressed behaviour, faltering growth, chronic cough, hoarseness and a single episode of pneumonia.

Treatment of GOR and GORD

• In **well infants with/without effortless regurgitation of feeds**, provide reassurance and monitor. Symptoms resolve in 90% of infants by aged 1 year of age. Do not routinely investigate if presenting with only one of above symptoms. Seek advice from a health visitor on responsive, paced bottle feeding and/or breastfeeding specialist.

• In **breastfed or formula fed infants** with **frequent regurgitation and marked distress** take a stepped care approach (as per NICE guidelines NG1: Gastro-oesophageal reflux disease in children and young people: diagnosis and management.

Breastfeeding	Formula feeding
1. Complete feeding assessment advise patient to see health visitor/infant feeding advisor. 2. Alginate therapy for a trial period of 1–2 weeks. If successful continue but try stopping at intervals to see whether it is still required. 3. Consider cows' milk exclusion.	1. Review feeding history including overfeeding, positioning and activity. 2. Trial smaller, more frequent feeds 6-7 x day (aim to meet requirements of 150ml/kg) 3. 1-2 week trial of **OTC thickened formula** (see below). **DO NOT PRESCRIBE.** 4. Stop thickened formula and offer alginate therapy for a trial period of 1–2 weeks. 5. Consider cows' milk protein allergy.

Review

• If symptoms persist despite stepped care approach, consider pharmacological treatment (e.g. H2 antagonists), sharing risks and benefits of medication with parents (refer to NG1), or a trial of cows' milk protein exclusion (see Red Flags for CMPA).

• There is little evidence for the efficacy of PPI's in infants <1 year, in this group use H2 antagonists. In older children PPI can be trialled. Use a 4 – 8 weeks trial of acid suppression then wean if symptoms improved.

Red Flags

Red Flags for possible CMPA – if present, consider 2- 4 weeks of cows' milk protein exclusion (maternal if breastfed, eHF if formula fed) under dietetic guidance, before a trial of H_1 antagonist[16]:

- Existing atopic disease, in particular eczema in infants
- First degree relative with food allergy or atopic disease
- **More than one** of the following are present: GOR/GORD, chronic loose stools, blood or mucus in stools, abdominal pain, food refusal or aversion, constipation, peri-anal redness, pallor and tiredness, faltering growth in conjunction with one or more gastrointestinal symptoms (with or without atopic eczema).

Referral onwards

Urgent (same day) referral is required if a child presents with:

- Bile, blood stained vomit, projectile vomiting, melaena and/or dysphagia.

Referral to secondary care is required in infants presents with:

- Persistent pain (requiring on-going medical therapy), faltering growth, iron deficiency anaemia, regurgitation persisting beyond 12 months old, suspected Sandifer's syndrome and persistent feeding aversion.

Referral to gastroenterology services is also required after failed trial of milk exclusion / H_1 antagonist in infants with red flags for CMPA **or** after a failed trial of H_1 antagonists only, in infants with no red flags for CMPA.

Table 5: Thickened Formula

Thickened Formula - Available OTC DO NOT Prescribe		
Aptamil® Anti-Reflux (900g) (Milupa)	From birth until 12 months	Contains carob bean gum
Cow and Gate® Anti-Reflux (900g)		Contains carob bean gum
SMA® Anti-Reflux (800g)		Contains corn starch

NOTES

- Alternatively, prescribe Carobel to add to regular milk formula and titrate as needed
- Do not use thickened formula alongside alginate therapy e.g. Gaviscon.
- Parents should refer to manufacturers' guidance on how to prepare thickened formula.

Note: This is currently not in line with DOH guidance on safe preparation of infant formula and parents should be made aware of the risk of infection.

- If symptoms resolve continue but review and trial infant first milk at intervals.

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