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EAP STATEMENT

Medical care for migrant children in Europe: a practical recommendation for first and follow-up appointments

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Abstract

Between 2015 and 2017, an estimated 200,000 to 400,000 children were seeking asylum each year in EU/EEA countries. As access to high-quality health care is important, we collected and compared current recommendations across Europe for a consensus recommendation on medical care for migrant (asylum-seeking and refugee) children. Existing recommendations were collected from published literature and identified through national representatives from paediatric societies of 31 EU/EEA countries through the European Academy of Paediatrics (EAP). Recommendations were systematically extracted and collected in a database. Those mentioned in at least one recommendation were evaluated for inclusion, and evidence on recommendations was specifically identified in literature searches focused on recent evidence from Europe. For eight EU/EEA countries, a national recommendation was identified. Growth and development, vision and hearing impairment, skin and dental problems, immunisations, anaemia, micronutrient deficiency, helminths, hepatitis B and C, human immunodeficiency virus, malaria, schistosomiasis, syphilis, tuberculosis, mental health disorder and sexual health were most frequently mentioned and therefore selected for inclusion in the recommendation.

Conclusion: The current document includes general recommendations on ethical standards, use of interpreters and specific recommendations for prevention or early detection of communicable and non-communicable diseases. It may serve as a tool to ensure the fundamental right that migrant children in Europe receive a comprehensive, patient-centred health care.

Keywords Asylum-seeking children · Refugee · Check-up · Health care · Immigrant · Unaccompanied minor · Vaccination · Immunisation · Tuberculosis

Background

Countries in the European Union (EU) and European Economic Area (EEA) continue to be challenged by the health needs of asylum seekers and refugees. In recent years, an unprecedented high number of children and adolescent were seeking asylum in EU countries [142]. In 2017, over 200,000 children and adolescents claimed

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asylum adding to an estimated 800,000 children and adolescents that arrived in 2015 and 2016 [143]. Although there is considerable heterogeneity in the demography of asylum seekers and refugees across Europe, children are estimated to make up over 30% of all asylum seekers. In 2016 and 2017, most asylum-seeking children and adolescents in the EU and EEA originated from the Syrian Arab Republic, Afghanistan and Iraq [143, 145]. In absolute numbers, Germany remained the top destination for asylum-seeking and refugee children and adolescents but high numbers were also recorded in France, Greece, Italy, Austria, Sweden, the UK, Spain and Switzerland [143].

Meeting the health needs of migrant children in Europe is important as this is a particularly vulnerable group and paediatricians therefore play a unique role. All countries in the EU/EEA have signed the United Nations Convention on the Rights of the Child, which implies that migrant children, regardless of their legal status, have the right to health care of the same standard as non-migrant children [144]. Therefore, a health assessment is recommended in almost all countries in the EU/EEA in newly settled migrant children [60]. The terminology and implementation for the health assessment varies widely across EU/EEA countries and includes 'health screening' and 'medical examination' [61]. The main aim of such a health assessment is similar in all countries and focuses on both the identification of individual health needs in the migrant population and the prevention of health risks for the resident population.

In Canada, the USA and Australia, paediatricians are guided by national recommendations for the care of migrant children [23, 118, 139]. In Europe, the European Commission has issued a handbook for health professionals on the health assessment of refugees and migrants in the EU/EAA [68]. This protocol has been tailored for the early health assessment at reception centres or organised hotspots to identify significant medical conditions that impact on placement in hosting institutions and fitness for travel. Only few European countries have national guidelines for primary care for migrant children. The European Academy of Paediatrics (EAP) EAP advocates for medical care without barriers, inequities and inequalities for all children in Europe [38]. It has therefore initiated a survey of existing recommendations and has facilitated a group of experts to compile recommendations providing primary care for migrant children in Europe. The current document is based on existing national recommendations, expert opinion and available evidence. It provides a practical approach aimed at the identification of health needs and medical care for migrant children in Europe.

Methods

Data collection

Current existing clinical guidelines and recommendations on the management of migrant children in the EU/EEA were collected and compared. EAP representatives from national paediatric societies from 31 EU/EEA countries were approached by email between 1 December 2016 and 1 June 2017 in which they were asked to provide the working group with their national guideline or recommendation for the medical care of migrant children. Data were collected from these national clinical guidelines and from published non-European recommendations from Canada, the USA and Australia [20, 23, 118]. Recommendations for all diseases and conditions were systematically extracted and collected in a database; those mentioned in at least one of the national recommendations were evaluated for inclusion into the recommendation.

Definitions

There is no universally accepted definition of a migrant. Many publications and recommendations use the terms asylum-seeking, refugee, displaced and migrant interchangeably. For this recommendation, we used the term 'migrant' universally and in place for the definition put forward by the International Society for Social Paediatrics and Child Health was used [49]. 'Migrant children' refers to children and adolescents less than 18 years of age who are on the move or have settled in other country and who experience unfavourable conditions including exposure to war and other forms of violence, socioeconomic deprivation and limited access to health care and education.

Writing process of the recommendation

The core writing group, including two primary care paediatricians (SdT and CW, EAP national delegates), one paediatric infectious diseases specialist (NR) and a paediatric registrar and clinical pharmacologist (LS, European junior doctors representative in EAP), selected and discussed the diseases or conditions that were mentioned in at least 7 out of 11 of the included guidelines. Then, for each disease (indicated with an*), a literature search for recent data specific to migrant populations particularly in Europe and indirect evidence from other populations was done. Relevant evidence was classified according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) for quality of evidence and strength of recommendation (Electronic supplementary material Tables 1 and 2, [94]). During the discussions, a balance was sought between the quality of the

evidence, potentially desirable and undesirable effects of screening or intervention, practical issues and costs.

Availability of national recommendations

Responses were received from EAP representatives of all 31 countries (100% response rate). National representatives from eight countries (Austria, Finland, Germany, Italy, Spain, Switzerland, UK and the Netherlands) reported to have a national guideline or recommendation that included the primary care management of migrant children and adolescents. All were available as online resources and/or published articles [3, 9, 30, 42, 43, 47, 92, 103, 104, 126]. National representatives from 23 European countries reported that there was no national recommendation available or that they were not aware of such a document.

Conditions covered in at least one of the national guidelines are summarised in Table 1.

Of these, growth and development, vision and hearing impairment, skin and dental problems, immunisations, anaemia, micronutrient deficiency, helminths, hepatitis B and C, human immunodeficiency virus (HIV), malaria, schistosomiasis, syphilis, tuberculosis, mental health disorder and sexual health were mentioned in at least 7 out of 11 guidelines and therefore selected for further evaluation and inclusion into the recommendation.

Recommendations

Recommendation 1: Make sure the migrant child is accompanied by at least one parent or a legally responsible caregiver (grade D).

If not, find out if the child has a caregiver. If the child has an adult caregiver, ask the child to return for another appointment with the responsible caregiver and contact social workers to help the child or adolescent to achieve this. For unaccompanied children, some countries have a system in place of legal advisors.

In the following, the recommendations are summarised into 12 items within three sections including (i) general non-medical recommendations, (ii) general medical-recommendations and (iii) recommendations concerning screening for infections and immunisations. A summary of all recommendations can be found in Table 2. The recommendations are grouped according to symptoms and each recommendation may include elements from history taking, examination and investigations. We have given priority to recommendations useful for the first appointments and suggest what to cover in follow-up appointments.

Migrant children—as all children—should not be held solely responsible for managing their health. While their right to participate in their health care should be respected during all visits, they should be provided with care in the presence and with the assistance of an adult who is legally responsible for their care and who is able to make health decisions on their behalf, if necessary. If a child arrives for a health visit unaccompanied by a caregiver or legal advisor, health workers should determine if there is an adult who is responsible for their care. If the child has an adult who is responsible for them, the child should be given a new appointment and the health services should ensure that the caregiver is informed about the new appointment and is able to accompany the child for the return visit.

Children who are identified as separated or unaccompanied require special protection [49]. In such circumstances, the relevant social services should be notified and brought in to assist in the reception and care of the child.

Recommendation 2: Make sure the parent/caregiver is able to communicate competently; access professional interpreter services if limited language proficiency is suspected (grade C).

Professional interpreter services including face-to-face, telephone or video services are available in many countries. If not available, ask the migrant child and family to return for another appointment together with a person able to interpret and/or contact social workers to ensure this and defer the following recommendations preferably to a next appointment.

It is essential to ensure good communication between health care professionals and migrant children and families to deliver appropriate and effective care [12, 15, 71]. Language barriers between patients and providers have been shown to reduce the quality of health care and increase the risk of adverse events and fatal outcomes both in hospital and primary health care settings [11, 32, 121]. In a European-wide survey among paediatric accident and emergency staff, 60% reported language and translation issues being one of the most critical barriers in providing care to migrant children (RefuNET survey, personal communication from Ulrich von Both, 05 February 2019). Assessment of language proficiency is not trivial, and the requirement of an interpreter may only become evident during the encounter. The use of professional interpreters has been demonstrated to improve the quality of translations and thereby reducing unnecessary diagnostics and treatments but most data originates from hospital-associated consultations [12, 39, 41, 56]. Professional medical interpreters reduce the cost of care and increase patient satisfaction and have been shown to be favourable compared with relatives or health care workers without professional interpreter skills [79]. Therefore, medical interpreters and cultural mediators should be made available during language-discordant health care encounters [68, 102] and adequate time should be allocated for these encounters [48]. Face-to-face

Table 1 Conditions with recommendations in national clinical guidelines for child migrant care in Europe and selected non-European countries

	Country [reference]										
	DE [115]	CH [9, 42]	AU [47]	UK [139]	SP [92]	FI [103]	IT [104]	NL [43]	CA [118]	USA	AUS
Vaccine-preventable infection											
Measles, mumps, rubella	Complete	Complete	Complete	Complete	Complete	Complete	Complete	Complete	Complete	Complete	Complete
Diphtheria, pertussis, tetanus, polio	Complete	Complete	Complete	Complete	Complete	Complete	Complete	Complete	Complete	Complete	Complete
Varicella infection		Complete >11 years	Complete, recommended			Complete			Complete <13 years; screen >13 years		Complete <14 years; screen ≥14 years
Haemophilus influenza b infection	Complete	Complete <6				Complete	Complete	Complete			Complete <5 years
Influenza			Complete, recommended								
Meningococcus B or C infection	Complete	Complete, recommended	Complete, recommended		Complete	Complete	Complete	Complete			Complete
Pneumococcus infection	Complete	Complete, <5 years, recommended	Complete			Complete	Complete	Complete			Complete, <5 years
Hepatitis A infection	If increase in transaminase		Screen, all		Screen					Be alert	
Hepatitis B infection	Complete	Screen, all	Screen, all	Be alert, screen, consider	Screen, all	Screen, all	Screen, all	Complete	Screen, at risk	Screen if no documentation, all	Screen, all
Hepatitis C infection	If increase in transaminase		Screen, all	Screen, consider	Screen, all		Screen, all	Be alert	Screen, at risk	Be alert	Screen, at risk
Hepatitis D infections										Be alert	
Tick-born encephalitis			Complete, recommended								
Yellow fever											Pre-immigration: if relevant
Polio											Pre-immigration: if relevant
Rotavirus	Complete										
Other infections											
Malaria		Screen, at risk	Screen, at risk	Screen, consider, at risk	Screen, at risk		Screen, at risk	Be alert	Screen, at risk	Treat or screen, at risk	Screen, at risk
Tuberculosis	Screen, all	Screen, all <5 years; at risk >5 years	Screen, ≥6 yearsy, be alert, all	Be alert, screen, at risk	Screen, all	Screen if not vaccinated	Screen, all	Screen, at border	Screen, at risk	Screen, all	Screen, all
HIV	Screen if symptoms	Screen, all	Screen, all	Be alert, screen, consider	Screen, at risk	Screen	Screen, all	Be alert	Screen, at risk	Screen if no documentation, all	Screen ≥15 years or younger and at risk
Schistosomiasis infection	Screen if symptoms	Screen, at risk	Be alert	Screen, consider, at risk	Screen, at risk		Screen if negative stool probe		Screen, at risk	Screen or treat, at risk	Screen, at risk

Table 1 (continued)

	Country [reference]										
	DE [115]	CH [9, 42]	AU [47]	UK [139]	SP [92]	FI [103]	IT [104]	NL [43]	CA [118]	USA	AUS
							and eosinophilia				
Helminth (including strongyloides)	Screen if symptoms	Screen, at risk	Be alert	Screen or treat	Screen, all	Screen, at risk	Screen, all		Screen, at risk	Be alert-screen	Treat
Protozoan infection	Screen if symptoms	Screen or treat, all	Be alert		Screen, all	Screen, at risk	Screen, all			Be alert	Screen, all
Chagas		Screen, at risk	Be alert		Screen, at risk					Be alert, at risk	
Leishmaniasis	Screen if symptoms	Be alert	Be alert	Screen, consider, at risk	Be alert					Be alert, at risk	
Leprosy					Be alert						
Typhoid fever	Screen if symptoms	Be alert								Be alert, if febrile	
Dengue		Be alert									
Infectious skin disorder like scabies, dermatological mycosis, impetigo, lice, infected eczema	Screen if symptoms	Be alert	Be alert	Be alert	Be alert					Be alert	Screen, all
Syphilis		Screen <2 years; screen other ages if at risk	Screen <2 years			Screen	Screen, all			Screen if no documentation, all	Screen, at risk
Other STI					Screen, at risk					Be alert, at risk	Screen, at risk
Helicobacter pylori infection										Be alert	Screen, at risk
Mental health and physical/emotional maltreatment											
PTSS	Be alert	Be alert	Be alert	Be alert	Be alert			Screen	Be alert	Be alert	Pre-immigration: screen, all
Child maltreatment			Be alert	Be alert				Be alert	Be alert		
Sleep and behavioural disturbances				Screen	Be alert			Screen		Be alert	
Social support and education		Evaluate		Evaluate	Evaluate and inform			Evaluate			
Functional symptoms		Be alert									
Chronic and non-communicable diseases											
Anaemia	Be alert	Be alert	Be alert	Be alert	Be alert		Be alert	Be alert		Be alert	Screen, all
Iron-deficiency anaemia	Screen, suggested	Screen, all	Be alert		Screen, allTreat, at risk		Screen	Screen if clinical suspicion	Screen, at risk	Screen, at risk	Screen, all
Hemoglobinopathy		Consider, at risk	Be alert		Screen, at risk			Screen if clinical suspicion		Screen, at risk	
Thalassemia					Screen, at risk						
G6PD deficiency			Be alert							Screen, at risk	

Table 1 (continued)

	Country [reference]										
	DE [115]	CH [9, 42]	AU [47]	UK [139]	SP [92]	FI [103]	IT [104]	NL [43]	CA [118]	USA	AUS
							Screen, if anaemia and at risk				
Nutritional deficiencies		Be alert	Screen 25/OHD, consider, treat (vit D), all	Be alert	Be alert, screen 25/OH/ cholecalciferol, at risk, treat (vit D), at risk		Be alert, screen electrolytes			Be alert	Screen vit D, at risk, screen vit B12, at risk
Lead poisoning					Screen, at risk and with symptoms					Be alert, screen, at risk	
Liver or kidney failure			Screen, all				Screen, all				
Hypertension										Screen if 3 years or older or at risk	
Congenital metabolic or endocrine disorders			Be alert, Screen TSH		Screen, if not done previously		Screen TSH and glucose	Neonatal screening if <6 months of age		Be alert, at risk	
Congenital defects or genetic conditions							Be alert	Evaluate		Be alert, at risk	
Dental disease	Screen	Screen, all	Screen, all	Check			Screen, all		Screen, all	Screen, all	Screen, all
Vision impairment	Screen, suggested	Screen, all	Screen, all	Screen if concerns			Screen, all	Screen, all	Screen, all	Screen, 3 years and older	Screen, all
Hearing impairment	Screen, suggested	Screen, all	Screen if concerns	Screen if concerns			Screen, all	Screen, newborns		Screen, newborn and 4 years and older	Screen, all
Growth and development impairment	Screen	Screen, all		Screen, all	Screen, all		Screen, all	Screen, all		Screen, all	Screen, all
Women's health											
Contraception issues				Screen, adolescents				Evaluate and inform	Screen, adolescents	Screen, adolescents	Inform adolescents
Human papillomavirus infection	Vaccinate female 9–14 years	Vaccinate, female 11–14 years	Vaccinate, all					Vaccinate, girls ≥12 years	Vaccinate ≥9 years		Vaccinate, adolescents
Cervical abnormalities									Screen, adolescents		Standard prevention screening
Sexual health (for example; sexual exploitation,	Check FGM	Evaluate		Evaluate and inform	Evaluate and inform			Evaluate and inform		Evaluate and inform	Be aware

Table 1 (continued)

	Country [reference]										
	DE [115]	CH [9, 42]	AU [47]	UK [139]	SP [92]	FI [103]	IT [104]	NL [43]	CA [118]	USA	AUS
female genital mutilation)											
Lifestyle-related problems											
Alcohol, tobacco or drug abuse		Be alert		Inform, adolescents				Inform			
Obesity or malnutrition		Be alert		Inform, adolescents	Inform			Inform		Be alert	

If guidance document specifically included that action was recommended, 'complete' was added to the table. If guidance specifically addressed that all or only children at risk should be screened, 'screen' was added to the table

Complete, complete vaccination schedule; *be alert*, look for signs and symptoms; *screen*, screen; *evaluate*, discuss; *consider*, consider if; *at risk*, only in children at risk (if endemic in country of origin, if exposure, if certain age group)

interpreters are generally preferred by both European and non-European migrants [52–54, 65].

Another important aspect of care relates to the provision of culturally sensitive health information. [48]. This may include signposts that are adapted by using pictograms or colour codes, as well as translated leaflets with information about specific health topics [49]. The ICOON picture dictionary may be helpful as a first communication tool (http://icoonforrefugees.com). This tool includes over 2000 generic icons and photos, including those specifically focused on health and health care issues in migrants.

Recommendation 3: Ask about health problems that the parents/caregivers and the children themselves identify (grade D).

To get familiar with the situation of the migrant children and their families, a few simple but important questions may be asked at the outset of the consultation. A mnemonic list for this is suggested in Table 3. It is however important to keep in mind that migrant children may present with a wide range of health problems not necessarily relating to their migrant background [117]. The heterogeneity of the migrant population is large, and several factors considerably influence previous care and current health requirements. The focus of the initial primary care health assessment should therefore be to identify individual health needs. The following recommendations should not be used as a checklist but serve as a tool in the dialogue with the family to identify individual requirements.

Recommendation 4: Ask about growth* and development* and perform a physical evaluation including assessment of weight-for-age and height-for-age, development and vital parameters. Be alert for signs of congenital anomalies* (i.e. heart defects), non-communicable (developmental delay and tumours) and infectious diseases (hepatosplenomegaly and lymphadenopathy) (grades C and D).

Evaluation of growth and development are part of routine assessments in primary care paediatrics. In the country of origin, migrant children may have not been followed regularly and important reasons for growth or development disorders may have gone unnoticed. Both malnutrition and overweight/obesity are prevalent in many countries of origin of migrant children. Studies indicate that newly arriving migrant children have a higher prevalence of growth abnormalities particularly reduced weight-for-age and height-for-age [130, 132]. Moreover, migrant children from countries in North Africa show increasing levels of childhood obesity particularly after resettlement to Italy [25, 50, 51]. This has also been shown for other migrant populations in other countries including Switzerland and Austria [46, 71, 77]. Contrary to this, in a study in

Table 2 Summary of the recommendations

1		Make sure the migrant child is accompanied by at least one parent or a responsible caregiver.
2		Make sure the parent/caregiver can communicate competently; access professional interpreter services if limited language proficiency is suspected.
3		Ask about health problems that the parent/caregiver and the children themselves identify.
4		Ask about growth and development and perform a physical evaluation including of weight-for-age and height-for-age, development and vital parameters. Be alert for signs of congenital anomalies (i.e. heart defects), non-communicable (developmental delay and tumours) and infectious diseases (hepatosplenomegaly and lymphadenopathy).
5		Ask for vision and hearing problems; perform a routine vision and hearing screen.
6		Examine the entire skin and oral cavity and be alert for signs of anaemia, scabies, impetigo, malnutrition, tooth decay and scars.
7		Check immunisation status and - if unknown or incomplete - start catch-up immunisations according to national recommendations as soon as possible.
8		Take a blood sample to measure a) haemoglobin to check for anaemia and treat iron deficiency if present b) HBV-antibodies (Hbs-Ag, anti-Hbs and anti-HBc)
		ADD a) if risk factors or signs for nutritional rickets: Vitamin D b) if from sub-Saharan Africa: Schistosomiasis* serology and CCA urine test c) if from sub-Saharan Africa or known risk: HIV serology or PCR d) if febrile: Malaria screen e) if immunosuppression known or foreseen: Strongyloides serology f) if sexually active or abused: Syphilis serology **OPTIONAL** g) HCV-antibodies
9		Perform a tuberculosis screening for latent infection (tuberculin skin test/ interferon-gamma release assays) followed by chest x-ray if either test is positive in: a) all migrant children < 5 years of age b) migrant children from a high-endemic country including but not limited to sub-Saharan-African region, Afghanistan, Somalia/Eritrea
10		Treat empirically for intestinal parasites with albendazole in children > 2 years and > 10 kg.
11		Schedule a follow-up appointment for catch-up immunisations, screen for mental health risk factors and symptoms, female genital mutilation and coordinate ongoing care needs the child may have.
12		Provide the parent/caregiver with a document of the health assessment and interventions and store a copy of this in your records. If available and compliant with data protection law of your country, also store health care related information in encrypted digital form enabling both migrants and healthcare institutions to have fast and secure access.

unaccompanied adolescent migrants in Germany normal body mass index was found [89]. Importantly, as migrant children have anthropological differences due to genetic background appropriate adjusted percentiles and values for growth and development are required [50, 57].

Standardised developmental screening may be challenging in migrant children. The Parents' Evaluation of Developmental Status (PEDS) or the handbook for health professionals on the health assessment of refugees and migrants by the European Commission may be used as a developmental tool in migrant-focused paediatric primary care, particularly when linked with appropriate interpreter services [66, 68, 78].

Congenital heart disease accounts for nearly one-third of all major congenital anomalies. The reported birth prevalence has increased substantially over the last century, reaching a stable estimate of 1.35 million new-borns with congenital heart disease every year, with the highest reported birth prevalence in Asia [148]. The frequency of previously undetected and/or untreated congenital heart defects in migrant children is unknown but has been described both in refugee camps and hospital-admitted migrant children [1, 117]. Other non-communicable diseases may be more common. In 2015, 13% of hospital-admitted migrant children in a University Hospital in Switzerland had a previous medical condition, including diabetes mellitus type 1, leukaemia and seizure disorder [117]. Infections both acute and chronic are the most common disease affecting up to 60% of migrant children [89, 107, 127, 140].

Recommendation 5: Ask for vision* and hearing problems*, perform a routine vision and hearing screen (grade D).

Vision loss and undiagnosed sight-threatening eye disease may be more common in migrant children, since hearing and vision impairment are major causes of disability worldwide [31]. However, current evidence on the frequency of vision and hearing abnormalities in migrant children is lacking. Evidence from adult refugees suggests that both vision and hearing impairment are common [156]. In addition, late identification of hearing problems may have serious consequences, including poor social-emotional and cognitive development, delayed speech and language acquisition and poor academic performance [100]. If age-appropriate screening suggests vision or hearing impairment it is recommended to refer the child to specialist further evaluation.

Recommendation 6: Examine the entire skin and oral cavity and be alert for signs of infections (including scabies, impetigo)*, malnutrition and micronutrion deficiency*, tooth decay* and scars* (grades B and C).

Infectious skin and soft tissue diseases are among the most frequently encountered health problems of newly arrived migrants in Europe. Poor hygienic conditions during their travel and in the country of arrival can lead to skin infections. Scabies has been reported in 3% of unaccompanied adolescent migrants in Germany and skin problems were one of the most common physical findings in young migrants in Croatia [89, 91]. Another rare but potentially life-threatening skin infection is cutaneous diphtheria, which manifests as chronic skin ulcer and is increasingly found in migrants in Europe [95]. Poor nutritional status and micronutrient deficiency are also common in studies of migrant children and particularly results in vitamin D deficiency including severe rickets and iron deficiency (see also below) [26, 127, 131]. Furthermore, migrant children are routinely suffering sexual violence, exploitation, abuse and detention; therefore, the skin should be examined carefully for scars [142].

Worldwide, oral conditions affect 3.9 billion people, with untreated caries in permanent teeth being the most prevalent condition, especially in Oceania, South Asia, North Africa/Middle East and West, Central and Southern Sub-Saharan Africa [88]. Migrant children may have increased rates of dental caries due to inadequate dental care in the country of origin [70]. In unaccompanied migrant adolescents in Germany, pathological dental status has been reported in 20% of adolescents, especially in Sub-Saharan and Northern African migrants [89]. The involvement of paediatricians can facilitate the promotion and prevention of dental caries. In addition, early detection and referral helps to avoid surgical interventions [107]. Therefore, dental health should be evaluated and referral to a dentist should be arranged as appropriate.

Migrant children may be susceptible to vaccine-preventable diseases upon arrival in Europe, due to barriers in access to preventive care in their country of origin and during their period of travel, which may last up to years [49, 98]. Data on vaccination coverage of migrant children in Europe are limited, but coverage is likely to be variable. In Switzerland, only 27% of newly arriving migrant children had antibodies against diphtheria-tetanus-pertussis consistent with previous vaccination [28]. In Germany, migrant children appear to be at higher risk to be unvaccinated for measles, mumps, rubella and varicella with only 69% of children and adolescents being immune [69].

Recommendation 7: Check immunisation status and—if unknown or incomplete—start catch-up immunisations according to national recommendations as soon as possible.

In addition, in Germany the vaccination coverage for poliovirus has been estimated to be less than 15% among migrant children from Syria [13] and vaccination against hepatitis B virus in school age children was more often incomplete among migrant compared with native children in Germany and New Zealand [97, 127].

Although it is possible to perform pre-vaccination screening for specific antibodies, this approach is costly

and generally not recommended. Antibody concentrations as correlates of protection are standardised in the situation of known previous immunisation and poorly understood in the situation of unknown previous immunisation as in most migrants. As national immunisation schedules vary across Europe, catch-up immunisations should be started according to the national recommendations.

[74]. Young children are among the most affected, and it is estimated that worldwide 43% of all children younger than 5 years of age have iron-deficiency anaemia [136]. Most migrant children originate from regions with higher prevalence of acute and chronic malnutrition and higher rates of communicable diseases, including intestinal helminth infections. Detection of iron-deficiency anaemia is important, as it may

Recommendation 8: Take a blood sample to measure

a) Haemoglobin to check for anaemia* and treat iron defiency* if present (grade B)

b) HBV* (Hbs-Ag, anti-Hbs and anti-HBc) (grade B)

For HBV hepatitis B surface antigen (Hbs-Ag), the antibody to hepatitis surface antigen (anti-Hbs) and the antibody to hepatitis B core antigen (anti-HBc) should be used to differentiate between acute, resolving and chronic HBV infection.

ADD (all grades C and D)

c) If dark skin, covering clothes or signs for nutrional rickets:	vitamin D*
d) If from Sub-Saharan Africa:	Schistosomiasis* serology and CCA urine test
e) If from Sub-Saharan Africa or known risk:	HIV* serology or PCR
f) If febrile:	Malaria* screen
g) If immunosuppression is known or forseen:	strongyloides* serology
h) If sexually active or abused:	syphilis* serology

Optional

i) HCV *(grade D)

Anaemia and iron deficiency

Iron-deficiency anaemia is the most common cause of anaemia and the most common nutritional disorder worldwide lead to impaired physical and cognitive development and iron supplementation improves mental development in children [93, 129]. Anaemia prevalence among migrant children has been found to vary widely, ranging from 13 to 49% across

Table 3 HEALTH—acronym, summarising key questions for practitioners providing health care to asylum-seeking patients

Category	Questions
*H*ome	Country of birth and/or country of origin? Did (s)he receive health care (including screening/prevention) before leaving home?
*E*scape	Escape route? Total duration of escape?
*A*rrival	Date of arrival in host country?
*L*anguage	Languages spoken?
	Preferred language including dialect?
	Need of an interpreter?
	Preference male/female interpreter?
*T*ransition countries	Did (s)he stop for a longer time in another country?
	Did (s)he become ill in a transition country?
	Did (s)he receive health care (including screening/prevention)?
*H*ost country	Did the (s)he become ill in the host country? Did (s)he receive health care (including screening/prevention)? Does (s)he have an allocated primary care physician?

different countries and settings [10, 89, 113, 117, 130, 135]. While the reason for anaemia is often not identified, iron deficiency is likely the main cause [113, 130]. Diagnostic measures to confirm iron-deficiency anaemia include serum ferritin and haemoglobin or haematocrit response to iron administration. Other causes of anaemia, such as hemoglobinopathies or haemolytic anaemia may coexist with iron-deficiency anaemia but are less commonly found in migrant children [127]. In several countries in North Africa and Sub-Saharan Africa, the Middle East and West Asia, prevalence of thalassemia and sickle cell disease is high [116]. In Sub-Saharan African migrants in Spain, sickle cell trait and glucose-6-phosphate dehydrogenase deficiency were identified in 18 and 15%, respectively [80]. In the Netherlands, 6% of migrant children had anaemia due to thalassemia [135]. If hemoglobinopathy is suspected, a haemoglobin electrophoresis should be done.

Hepatitis B virus infection

Hepatitis B virus (HBV) is the most common cause of hepatitis worldwide, with prevalence in children reported up to 10% in certain Western Sub-Saharan countries [108]. The prevalence of HBV infection in Europe is estimated to be around 1% (range 0.1 to 4.4%) in the general population and lower in children [36]. In Europe, migrants from East Asia, the Pacific and Sub-Saharan Africa have the highest seroprevalence of chronic HBV infection, followed by migrants from Eastern Europe and Central and South Asia [27]. In Sub-Saharan African migrants in Spain, 15% were HBsAg positive [133]. The prevalence of Hepatitis B infection has been found to be highly variable among migrant children in Europe and reaching as high as 10% in undocumented migrants in Italy [18, 22, 77, 99]. Migrant children benefit from screening and treatment of HBV infection to prevent hepatitis and hepatocellular carcinoma since the risk of developing chronic HBV infection is up to 50% for children infected before the age of 5 and 90% for those infected at birth [33, 118, 125]. In addition, there is evidence that screening migrants for HBV is cost effective [55, 72].

Vitamin D deficiency

Accumulating global reports indicate that vitamin D deficiency (in the following defined as 25-OH-vitamin D levels < 25 nmol/l) is a widespread and major health problem, particularly in middle Eastern countries [111]. There are few studies on vitamin D screening in migrant children. In a Norwegian study, 17 to 58% of the girls and 4 to 23% of the boys had vitamin D deficiency, with greater prevalence among adolescents and in children from Iraq and Afghanistan [34]. An Australian study in Afghan migrants found that 23% were vitamin D deficient [131]. Children with Vitamin D deficiency are at risk of developing osteomalacia and nutritional rickets, however not all children develop symptoms [101]. Clinicians should therefore be attentive for the following signs: swelling of ankles and wrists, delayed (>2 years of age) closure of the fontanelle, delayed tooth eruption (lack of incisors by 10 months or molars by age 18 months of age), leg deformity, delayed gross motor development (crawling and walking), failure to thrive and muscular weakness [101]. As general vitamin D screening in migrant children is unlikely to be cost-effective, only children with risk factors or signs suggestive of symptomatic vitamin D deficiency should be tested [4, 34]. For prevention of vitamin D deficiency, national recommendations should be followed. For treatment of nutritional rickets, generally daily doses of 2000 to 6000 IU/day (depending on age) for a minimum of 3 months together with 500 mg/day oral calcium per day are recommended [101]. Single high-dose treatment may be an alternative, and appropriate dose recommendation can be found in the global consensus recommendations on prevention and management of nutritional rickets [101].

Schistosomiasis

Schistosomiasis is rare in Europe and is mainly imported from endemic countries due to travelling or human migration [59]. In Germany, two studies in unaccompanied adolescent migrants showed that schistosomiasis was present in individuals with Sub-Saharan Africa origin in approximately 25% [89, 140]. A recent study in adolescent and young adult Eritrean refugees in Switzerland showed an even higher prevalence of schistosomiasis of almost 60% [21]. Lower prevalence was seen in Spain and Canada, where 9 to 15% of Sub-Saharan African migrants had evidence of schistosomiasis [133]. In contrast, unaccompanied adolescent migrants from Syria, Middle East and North Africa had a low prevalence of positive schistosomiasis serology of <2% [99, 140]. The two main Schistosoma species are *Schistosoma mansoni* causing intestinal and *S. haematobium* causing urogenital disease. Undiagnosed and chronic schistosomiasis may lead to hepatic fibrosis, portal hypertension, hypersplenism, ureter and bladder fibrosis, hydronephrosis and bladder cancer. Serologic testing is the most sensitive diagnostic modality for *Schistosoma haematobium* and for *S. mansoni*. In addition, a recently introduced low cost point-of-care test called circulating-cathodic-antigen (CCA) may also be used if available [21, 59]. If serology or CCA test are positive, referral to a practitioner experienced in the diagnosis and treatment of schistosomiasis is recommended.

Human immunodeficiency virus infection

More than 95% of individuals with HIV infection reside in developing countries, two-thirds of them in Sub-Saharan Africa. In Europe, between 1999 and 2006, more than half of patients with HIV infection were migrants, largely from Sub-Saharan Africa [29]. Migrant children from countries where HIV is endemic are at risk for HIV infection via mother-to-

child transmission [85]. The prevalence of HIV among migrant children varies based on risk factors from their home countries, during the journey and after arrival. Studies in Germany and Italy have found HIV prevalence of 0.4 and 1.7% in migrants, respectively [22, 77]. In Canada, 1% of HIV infections were seen in migrant children below 15 and 2% in those over 15 years of age [122]. HIV infection in children older than 18 months can generally be diagnosed by serology, although serological test can be falsely negative during the early course of the infection, when the antibody response has not yet fully developed. In infants and children younger than 18 months, in whom antibody tests are not reliable because of the persistence of transplacental acquired maternal antibodies, DNA or RNA assays are required. Rapid point-of-care antibody screening tests may be performed for convenience and/or costs; however, consent and appropriate pre- and post-test counselling should be performed. Any positive HIV ELISA or rapid test always requires confirmatory testing by either Western blot or molecular methods. If two-tier testing reveals HIV diagnosis, the child needs to be referred to a paediatric infectious disease specialist for appropriate treatment and further evaluation.

Malaria

More than 90% of malaria cases and 92% of malaria deaths occur in Sub-Saharan Africa, mainly in children younger than 5 years of age [153]. Imported malaria is most often seen in migrants and returning travellers who did not use adequate preventive measures. Despite this, malaria is rarely detected in asymptomatic migrant children. In unaccompanied minors in Germany and Spain originating from Sub-Saharan Africa only 1-2% had malaria and in a study in migrant children in New Zealand only one case was detected in 5 years [89, 127, 133, 140]. Compared with adults, children with malaria are more likely to present with non-specific symptoms including fever, lethargy, malaise and with gastrointestinal symptoms [24]. Children may also have hepatomegaly, splenomegaly and jaundice and are more likely to have fever greater than 40 °C [24]. The value of routine screening for asymptomatic malaria is unknown, and the characteristics of malaria screening tests in asymptomatic individuals are uncertain. Therefore, the recommendation is to focus on timely diagnosis and treatment of symptomatic malaria.

An important but rare differential diagnosis in this context, especially in patients originating from the Horn of Africa, is louse-born relapsing fever, an infection caused by *Borrelia recurrentis* [62, 150] The diagnosis for both malaria and louse-born relapsing fever is usually made by microscopic examination of thick and thin blood films, which should be requested urgently in any febrile migrant child from malaria-endemic areas (which includes but is not limited to Sub-Saharan Africa, Pakistan and Afghanistan).

Strongyloidiasis

Strongyloides stercoralis, an intestinal parasitic nematode, is increasingly detected, especially in Southern, Eastern and Central Europe, the Caribbean, in Southeast Asia, Latin America and Sub-Saharan Africa with reported prevalence up to 50% [120]. Migrants from Southeast Asia and Africa have the highest risk of infection [16, 19, 40] as has been seen in young migrants in Spain showing a prevalence of 28% of strongyloides infection [82, 133]. Subclinical infection or low-grade disease can persist for decades after migration and in the presence of immunosuppression may progress into life-threatening disseminated disease [17, 45]. Serologic testing is the most sensitive diagnostic modality to detect strongyloides as stool microscopy for ova and parasites has low sensitivity [17].Testing is recommended particularly for immunocompromised individuals or before initiation of immunomodulatory treatment.

Syphilis

Syphilis is most common in Sub-Saharan Africa, South and Southeast Asia and South America [152]. Beyond the neonatal period, sexual contact is the primary means of transmission of syphilis [151]. In a health centre in Spain, 6.4% of all migrants had a positive syphilis serology whereas in Malta, latent syphilis was found in 2.2% of adult migrants [87, 109]. Literature on the prevalence of syphilis in migrant children in Europe is lacking; however, it is known that migrant children are at increased risk of violence and sexual abuse [142]. Data from migrant children and adults seen in primary care clinics in Canada suggest syphilis is rare (<1%) in migrant children [151]. Children often have few dermal findings like chancre [83]. Therefore, asymptomatic children may only be identified by screening. Antibody tests like the Venereal Disease Research Laboratory (VDRL) test are used for initial screening because of their relatively low cost, ease of performance and ability to be quantified for following therapy response. However, they are non-specific and require confirmation by specific tests [151]. Children diagnosed with syphilis should also be evaluated for other sexually transmitted diseases and screened for exposure to sexual exploitation, violence and trafficking.

Hepatitis C virus infection

Worldwide, 177.5 million adults are infected with hepatitis C virus, especially in Asia and Africa [96]. In Europe, estimates of HCV prevalence is generally around 1% and up to 7% among migrants [63]. Studies from Italy and the Greek-Turkish border show that 0.8 and 3.7% of migrants were HCV antibody positive; however, age-disaggregated data was not provided in those studies [22, 35]. Most HCV-infected children and adolescents are asymptomatic, with normal liver function tests. Transmission in children is mostly from mother to

child, with 80% of those infected becoming chronic [134]. Spontaneous resolution of perinatally acquired HCV is rare after the age of 3 years. Like HBV, the goal of screening migrant children is to prevent progression to decompensated liver disease and hepatocellular carcinoma. However, as data on HCV infection in migrant children is scarce a general screening remains controversial. If screening is performed, serology should be used as generally most children older than 15–18 months with chronic HCV infection are seropositive. In anti-HCV antibody-positive patients, chronic infection is diagnosed by polymerase chain reaction for HCV RNA. In infants below 18 months of age, anti-HCV antibodies can still be of maternal origin; therefore, in this age group HCV RNA testing is required or testing is deferred to after 18 months of age.

Recommendation 9: Perform a tuberculosis* screening for latent tuberculosis infection (tuberculin skin test/interferon-gamma release assays) followed by chest X-ray if either test is positive in:

a) All migrant children <5 years of age (grade D)

b) Migrant children from a high-endemic country including but not limited to Sub-Saharan-African region, Afghanistan, Somalia/Eritrea (grade C)

Note: in case of clinical suspicion of active tuberculosis (prolonged fever, poor weight gain or weight loss without another explanation), perform all investigations according to national recommendations (grade B)

Tuberculosis

In recent years, notification rates for active tuberculosis have decreased in most EU/EEA countries, and tuberculosis now predominantly affects vulnerable populations including migrant children. Between 2000 and 2009, 15% of paediatric active tuberculosis cases in Europe were of foreign origin [105]. Many migrants originate from countries with a high incidence of tuberculosis increasing their risk. In addition, having lived in crowded conditions during their travel further increases the likelihood of recent exposure to active tuberculosis [90]. Children compared with adults are more likely to rapidly progress from tuberculosis infection (latent tuberculosis infection) to disease (active tuberculosis) and develop more severe forms of disease [123]. However, they have excellent outcomes if diagnosed and treated early and therefore screening of latent tuberculosis infection is important [73].

Dedicated policies for tuberculosis screening in migrants have a long tradition in many countries but mainly target adult patients and active tuberculosis disease [112, 124]. Data on incidence of latent tuberculosis infection and active tuberculosis in migrant children has however emerged in recent years. Active tuberculosis is rarely reported in migrant children usually around 1% with a maximum of 8% in study in the USA [2, 44, 77, 81, 89, 157]. Studies comparing the incidence of active tuberculosis in migrant children with non-migrant children from Europe show clearly higher incidence in migrant children [75, 106].

Data on latent tuberculosis infection in migrant children is more variable and dependent on age of the study population and test (tuberculin skin test and interferon gamma release assay). Studies reporting tuberculin skin test results report generally higher proportion of latent tuberculosis infection between 17 and 25%, with exception of one study from Greece that reported on 2.7% of positive tuberculin skin tests. The highest rates of latent tuberculosis infection detected by tuberculin skin tests was 61% in a study in Spain among adolescent and young adult migrants from Sub-Saharan Africa [44, 84, 113, 127, 133]. Further studies reporting results from interferon gamma release assay show lower prevalence of latent tuberculosis infection of approximately 10% [7, 84, 114].

Either the tuberculin skin test or inferferon gamma release assays can be used for screening. The tuberculin skin test cross reacts in patients immunised with bacille Calmette-Guerin (BCG) vaccine or in those infected with non-tuberculous mycobacteria [110]. In patients vaccinated with BCG, an interferon gamma release assays may be used instead of a tuberculin skin test, although interferon gamma release assays may be false negative in young children due to lower interferon gamma expression in younger individuals [138]. Several studies have analysed cost-effectiveness for latent tuberculosis infection screening in children and adults with the majority showing cost-effectiveness particularly in young children from countries with high tuberculosis incidence [37, 146, 158].

Recommendation 10: Treat intestinal parasites* empirically in all children >2 years and >10 kg with one dose of 400 mg albendazol (grade B).

Migrant children are at risk for contracting an intestinal infection with parasites due to repeated exposure to endemic parasitic diseases in their country of origin and conditions during their journey. A study of 247 migrant children in Italy found that children older than 5 years age of are more likely infected with intestinal parasites compared with non-migrant children [86]. Studies in Germany and Spain found the prevalence of parasitic infection among both unaccompanied and accompanied children as high as 20% [58, 89, 133, 140]. In those studies, the most commonly identified intestinal parasites were intestinal nematodes (*Ankylosoma duodenale*, *Necator americanus* and *Ascaris lumbricoides*), protozoa (*Giardia lamblia*, *Entamoeba* spp and *Strongyloides stercoralis*) and *Schistosomiasis* spp. Intestinal helminth infections with moderate to heavy worm

burdens can lead to malabsorption and chronic blood loss, with potential long-term effects on growth and development [76]. Evaluation of stool for gastrointestinal infections is, however, logistically challenging and requires evaluation of one to several specimens for adequate sensitivity [14]. As such, stool analysis should be considered for selected cases only. Empiric treatment with albendazole is inexpensive, of short duration, and has been shown in a seminal study in the USA including over 1600 refugee children to be highly effective and have a favourable safety profile [137]. It is important to note that a single dose of albendazole has variable efficacy. It is highly effective against *A. lumbricoides*, *A. duodenale* and *N. americanus*. However it has intermediate or limited efficacy against *S. stercoralis* and none against *G. lamblia* [137]. The recommended dose for albendazole for children above 2 years and above 10 kg is 400 mg as a single dose [128, 155]. Of note, safety data for children in the first 2 years of life is limited. Some authors recommend 200 mg as a single dose for children aged 12–23 months [155]. Albendazole should not be used in pregnant adolescents and in patients who have symptoms and/or a travel history compatible with neurocysticercosis.

Recommendation 11: Schedule a follow-up appointment to complete the catch-up immunisations, screen for mental health risk factors and symptoms*, female genital mutilation* and coordinate any ongoing care needs the child may have.

Continuity of care is important and careful consideration should be put into the scheduling of follow-up appointments. These should be used to review results and continue catch-up immunisations. Mental health concerns including emotional and behavioural problems in migrant children and adolescents are best approached in follow-up appointments unless these are identified as the main health need by the families or children in the initial appointment. Unaccompanied migrant children and adolescents are at higher risk for mental health problems [91], which is associated with the stress of separation from parents, traumatic events including the risk of sexual and gender-based violence and the lack of social support [5]. Signs of mental distress in migrant children and adolescents are diverse and dependent on age, traumatic experiences and social background and may be challenging to detect [6]. Very few screening instruments have been tested for diagnostic accuracy in migrants in general. The strengths and difficulties tool (http://www.sdqinfo.com/), which is available in over 60 languages, can assist in the identification of symptoms. For further information on screening tools and approaches we also refer to a recent review on this topic [64]. Most of the children and adolescents will not require treatment as symptoms fade over time in the host country. Referral to a child psychiatrist, however, should be considered when there is significant impairment of daily activities and/or ineffective or if the child or the family uses harmful coping strategies [91].

Female genital mutilation (FGM) may be another topic to be discussed in follow-up appointments. FGM consists of procedures that intentionally alter or cause injury to the female genital organs for non-medical reasons involving partial or total removal of the external female genitalia [154]. Worldwide, at least 200 million girls and women have undergone FGM [154]. The practice is highly concentrated in countries from the Atlantic Coast to the Horn of Africa, in areas of the Middle East (such as Iraq and Yemen) and in some countries in Asia (like Indonesia), but it exists also in other regions of the world [141]. In Europe, more than half a million first-generation migrant girls aged 10 years and older and women have undergone FGM for cultural or non-therapeutic reasons, most probably prior to arrival in Europe [147]. FGM can have serious and long-lasting consequences including genitourinary problems an increased risk of childbirth complications [8, 67] and significant psychological sequelae [149]. Signs of FGM noted during the examination (it may be appropriate to only let female doctors perform genital examinations in female migrant children) should lead to referral to a physician experienced in the management of girls and women with FGM [154].

Recommendation 12: Provide the parent/caregiver with a document of the health assessment and interventions and store a copy of this in your records. If available and compliant with data protection law of your country, also store health care-related information in encrypted digital form enabling both migrants and health care institutions to have fast and secure access

Based on this first health assessment, immediate treatment should be provided and referral to specialist care should be initiated if needed. Documentation of history, investigations and treatment is important to provide optimal and timely care and to avoid unnecessary investigations. A copy of the health record should be provided to the child's caregiver at the end of the assessment. This is particularly important, as it will help future providers, if the child moves onward or is seen by a provider at a facility that does not have access to the records from the visit. It may also help to ask the parent or child to take a picture of their most important health information such as a vaccination card to minimise the risk loss of information.

Limitations

This recommendation is based on currently available limited data and publications on migrant health in children. As migrant patterns will change and new evidence will become

available, some of the specific recommendations will inevitably require adaptation. A systematic literature search for each topic was beyond the feasibility for this recommendation and therefore emerging evidence from planned systematic literature searches will be important for updates of this recommendation [119].

Conclusion

The current document provides a recommendation based on expert opinion and available evidence for a standard of medical care for migrant children, endorsed by the EAP. These include general topics on ethical standards, use of interpreters, specific recommendations for prevention or early detection of communicable and non-communicable diseases and practical advice on follow-up consultations and documentation. It is fundamental that migrant children in Europe are treated according to United Nations Convention on the Rights of the Child to ensure that they receive a comprehensive, patient-centred health care.

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wrote the first draft of the manuscript. TS, UvB and JB critically and substantially revised the draft of the manuscript. All authors approved the final manuscript.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

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