# Providing medical care for migrant children in Europe: a practical recommendation

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**Abstract (200 words max)**

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 children.

Existing recommendations were collected from published literature and identified through national representatives from paediatric societies of 31 EU/EEA countries. In addition, guidelines from Australia, Canada, and the United States were reviewed. Evidence on recommendations to be considered for inclusion 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, anemia, micronturient deficiency, helminths, hepatitis B and C, human immunodeficiency virus, malaria, schistosomiasis, syphilis, tuberculosis, posttraumatic stress disorder and sexual health were most frequently mentioned and therefore selected for inclusion in the recommendation.

Conclusion:
The current document provides recommendations based on expert opinion and evidence for medical care for migrant children in Europe. These include general topics on ethical standards, use of interpreters, follow-up and documentation and specific recommendations for communicable and non-communicable conditions and diseases.

**Keywords**
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## 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 [133]. In 2017 over 200,000 children and adolescents claimed asylum adding to an estimated 800,000 children and adolescents that arrived in 2015 and 2016 [135]. Although there is considerably 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 [135; 136]. 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 United Kingdom, Spain and Switzerland [135].

Access to high-quality health care is important for migrant children as they have specific health risks and needs. 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-immigrant children [134]. In almost all countries in the EU/EEA, a health assessment is recommended in newly settled migrant children [55]**.** The terminology including “health assessment”, “health screening” and “medical examination” as well as the systematic voluntary or mandatory use thereof varies widely [56]. 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.

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. In Canada, the United States, and Australia, paediatricians are guided by national recommendations for the care of migrant children [21; 109; 130]. In Europe, the European Commission has issued a handbook for health professionals on the health assessment of refugees and migrants in the EU/EAA [63]. 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) initiated a survey of existing recommendations and has facilitated a group of experts to complie recommendations providing primary care for migrant children in a European host country. The current document is based on existing national recommendations, expert opinion and limited evidence. It provides a practical apparoach 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. Representatives from national paediatric societies from 30 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 United States and Australia [18; 21; 109]. 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, therefore for this manuscript, the definition of "migrant children" put forward by the International Society for Social Pediatrics and Child Health was used [45]. Briefly, "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), one paediatric infectious diseases specialist (NR) and a paediatric registrar and clinical pharmacologist (LS), 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. 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 [110]. Relevant evidence was classified according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) for quality of evidence and strength of recommendation (supplementary material Table 1 & 2). 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 recomendations**

Responses were received from representatives of all 31 countries (100% response rate). National representatives from eight countries (Austria, Finland, Germany, Italy, Spain, Switzerland, United Kingdom, and the Netherlands) reported to have a national guideline or recommendationt that included the primary care management of migrant children and adolescents. All were available as online resources and/or published articles [3; 8; 28; 38; 39; 43; 85; 96; 97; 117]. 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 the table 1. Of these, growth and development, vision and hearing impairment, skin and dental problems, immunisations, anemia, micronturient deficiency, helminths, hepatitis B and C, human immunodeficiency virus (HIV), malaria, schistosomiasis, syphilis, tuberculosis, posttraumatic stress 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: Check if the migrant child is accompanied by at least one parent or a legally responsible caregiver**.

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.

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 [45]. 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: Check if the parent/carer is capable to communicate sufficiently; 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 [11; 66]. Language barriers between patients and providers have been shown to reduce the level of health care and

increase the risk of adverse events and fatal outcomes [10; 30; 112]. In a European-wide survey amongst paediatric accident and emergency staff, more than 2/3 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, 1st November 2017). 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 reduce these risks by improving the quality of translations and reducing unnecessary diagnostics and treatments; furthermore, professional medical interpreters reduce the cost of care and increase patient satisfaction with the performance of health care professionals [11; 35; 37; 52]. Therefore, medical interpreters and cultural mediators should be made available during language-discordant health care encounters, [63; 95] and adequate time should be allocated for these encounters [44]. Face-to-face interpreters are generally preferred by both European and non-European migrants [48-50; 60].

Another important aspect of care relates to the provision of culturally-sensitive health information. [44]. This may include signposts that are adapted by using pictograms or colour codes, as well as translated leaflets with information about specific health topics [45]. The ICOON picture dictionary may be helpful as a first communication tool (http://icoonforrefugees.com). This tool includes over 2,000 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 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 2**. It is however important that migrant children may present with a wide range of health problems not necessarily relating to their migrant background [108]. 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. However, it is also important to acknowledge that health literacy and the concept of preventative health

measures may be limited and therefore the following recommendations can be used 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 asssement 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) (Grade C-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 [121; 123]. Moreover, migrant children from countries in North-Africa show increasing levels of childhood obesity particularly after resettlement to Italy [23; 46; 47]. This has also been shown for other migrant populations in other countries including Switzerland and Austria [42; 66; 72]. Contrary to this, in a study in unaccompanied adolescent migrants in Germany normal body mass index was found [82]. Importantly, as migrant children have anthropological differences due to genetic background appropriate adjusted percentiles and values for growth and development are required [46; 53].

Migrant children are at risk for developmental delays, but standardized developmental screening may be challenging. 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 interpretation services [61; 63; 73].

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

225 reported birth prevalence in Asia [138]. The frequency of previously undetected and/or
226 untreated congenital heart defects in migrant children is unknown but has been described
227 both in refugee camps and hospital-admitted migrant children [2; 108]. Other non-
228 communicable diseases may be more common. In 2015, 13% of hospital-admitted migrant
229 children in a University Hospital in Switzerland had a previous medical condition, including
230 diabetes mellitus type 1, leukemia, and seizure disorder [108]. Infections both acute and
231 chronic are the most common disease affecting up to 60% of migrant children [82; 100; 118;
232 131].
233 Vision loss and undiagnosed sight-threatening eye disease may be more common in migrant

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

234 children, since hearing and vision impairment are major causes of disability worldwide [29].
235 However, current evidence on the frequency of vision and hearing abnormalities in migrant
236 children is lacking. Evidence from adult refugees suggests that both vision and hearing
237 impairment are common [146]. In addition, late identification of hearing problems may have
238 serious consequences, including poor social-emotional and cognitive development, delayed
239 speech and language acquisition, and poor academic performance [93]. If age-appropriate
240 screening suggests vision or hearing impairment it is recommended to refer the child to
241 specialist further evaluation.
242

**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* (Grade B-C).**

243 Infectious skin and soft tissue diseases are among the most frequently encountered health
244 problems of newly arrived migrants in Europe. Poor hygienic conditions during their travel and
245 in the country of arrival can lead to skin infections. Scabies has been reported in 3% of
246 unaccompanied adolescent migrants in Germany and skin problems were one of the most
247 common physical findings in young migrants in Croatia [82; 84]. Another rare but potentially
248 life-threatening skin infection is cutaneous diphtheria, which manifests as chronic skin ulcer
249 and is increasingly found in migrants in Europe [88]. Poor nutritional status and micronutrient
250 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) [24; 118; 122]. Furthermore, migrant children are routinely suffering sexual violence, exploitation, abuse and detention; therefore the skin should be examined carefully for scars [133].

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 [81]. Migrant children may have increased rates of dental caries due to inadequate dental care in the country of origin [65]. In unaccompanied migrant adolescents in Germany, pathological dental status has been reported in 20% of adolescents, especially in Sub-Saharan and Northern African migrants [82]. The involvement of paediatricians can facilitate the promotion and prevention of dental caries. In addition, early detection and referral helps to avoid surgical interventions [100]. 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 [45; 91]. 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 [26]. 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 [64].

**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 [12] and vaccination against hepatitis B virus in school age children was more often incomplete among migrant compared to native children in Germany and New Zealand [90; 118].

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.

**Recommendation 8: 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 of are more likely infected with intestinal parasites compared to non-migrant children [79]. Studies in Germany and Spain found the prevalence of parasitic infection among both unaccompanied and accompanied children as high as 20% [82; 124]. 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 [71]. Evaluation of stool for gastrointestinal infections is logistically challenging and requires evaluation of one to several specimens for adequate sensitivity [13]. As such, stool analysis should be considered for selected cases only including persistent symptoms after empiric treatment. Empiric treatment with albendazole is inexpensive, of short duration, and has been shown to be highly effective with a favourable safety profile in children older than 2 years of age [128]. The recommended dose for albendazole for children > 2 years and > 10 kg is 400 mg as a single dose [119; 145]. Of note, safety data for children in the first two years of life is limited. Some authors recommend 200 mg as a single dose for children aged 12-23 months [145]. Albendazole should not be used in pregnant adolescents and in patients who have symptoms and/or a travel history compatible with neurocysticercosis.

**Recommendation 9: Take a blood sample to measure**

a) **hemoglobin to check for anemia* 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 Grade C-D)**

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| 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 isknown 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 [69]. 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 [127]. 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 lead to impaired physical and cognitive development and iron supplementation improves mental development in children [86; 120]. Anaemia prevalence amongst migrant children has been

found to vary widely, ranging from 13% to 49% across different countries and settings [9; 82; 106; 108; 121; 126]. While the reason for anaemia is often not identified, iron deficiency is likely the main cause [106; 121]. Diagnostic measures to confirm iron-deficiency anaemia include serum ferritin and haemoglobin, or haematocrit response to iron administration. Other causes of anaemia, such hemoglobinopathies or haemolytic anaemia may coexist with iron-deficiency anaemia but are less commonly found in migrant children [118]. 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. In sub-Saharan African migrants in Spain, sickle cell disease and glucose-6-phosphate dehydrogenase deficiency were identified in 18% and 15%, respectively [74]. In the Netherlands, 6% of migrant children had anaemia due to thalassemia [126]. 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 [101]. 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 [1]. 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 [25]. In sub-Saharan African migrants in Spain, 15% were HBsAg positive [124]. 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 [16; 20; 72; 92]. 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% of children infected before age 5, and as many as 90% infected at birth go on to develop chronic infection [31; 109; 116]. In addition, there is evidence that screening migrants for HBV is cost effective [51; 67].

*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 [104]. 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 [32]. An Australian study in Afghan migrants found that 23% were vitamin D deficient [122]. Children with Vitamin D deficiency are at risk of developing osteomalacia and nutritional rickets, however not all children develop symptoms [94]. 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 [94]. 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; 32]. 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 [94]. 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 [94].

*Schistosomiasis*

Schistosomiasis is rare in Europe, and is mainly imported from endemic countries due to traveling or human migration [54]. In Germany, two studies in unaccompanied adolescent migrants showed that schistosomiasis was present in individuals with sub-Saharan Africa origin in approximately 25% [82; 131]. A recent study in adolescent and young adult Eritrean refugees in Switzerland showed an even higher prevalence of schistosomiasis of almost 60% [19]. Lower prevalence was seen in Spain and Canada, where 9% to 15% of sub-Saharan African migrants had evidence of schistosomiasis [124]. In contrast, unaccompanied adolescent migrants from Syria, Middle East and North Africa had a low prevalence of positive schistosomiasis serology of < 2% [92; 131]. The two main Schistosoma species are *S. 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 *S. 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 [19; 54]. 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 in Europe were migrants, largely from Sub-Saharan Africa [27]. Migrant children from countries where HIV is endemic are at risk for HIV infection via mother-to-child transmission [78]. 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 [20; 72]. In Canada, 1% of HIV-infections were seen in migrant children below 15 and 2% in those over 15 years of age [113]. 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 transplacentally 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 futher 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 [143]. 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. Only 1-2% of unaccompanied minors in Germany and Spain from sub-Saharan had malaria and in a study in migrant children in New Zealand only one case was detected in 5 years [82; 118; 124; 131]. Compared to adults, children with malaria are more likely to present with non-specific symptoms including fever,

lethargy, malaise and with gastrointestinal symptoms [22]. Children may also have hepatomegaly, splenomegaly and jaundice, and are more likely to have fever greater than 40°C [22]. The value of routine screening for asymptomatic malaria is unknown and the characteristics of malaria screening tests in asymptomatic individuals is 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* [57; 140] 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).

*Strongyloides*

*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% [111]. Migrants from Southeast Asia and Africa have the highest risk of infection [14; 17; 36] as has been seen in young migrants in Spain showing a prevalence of 28% of strongyloides infection [75; 124]. 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 [15; 41]. Serologic testing is the most sensitive diagnostic modality to detect strongyloides as stool microscopy for ova and parasites has low sensitivity [15].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 [142]. Beyond the neonatal period, sexual contact is the primary means of transmission of syphilis [141]. 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 [80; 102]. 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 [133]. Data from migrant children and adults seen in primary care clinics in Canada suggest syphilis is rare (< 1%) in

migrant children [141]. Children often have few dermal findings like chancre [76]. 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 nonspecific and require confirmation by specific tests [141]. 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 [89]. In Europe, estimates of HCV prevalence is generally around 1% and up to 7% among migrants [58] . Studies form Italy and the Greek-Turkish border show 0.8% and 3.7%, respectively of migrants were HCV antibody positive; however, age-disaggregated data was not provided in those studies [20; 33]. 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 [125]. 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.

*Tuberculosis*

**Recommendation 10: Perform a tuberculosis* screening (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)**

In recent years, TB notification rates have decreased in most EU/EEA countries, and tuberculosis now predominantly affects vulnerable populations including migrant children. Between 2000 and 2009, 15% of paediatric tuberculosis cases in Europe were of foreign origin [98]. Many migrants originate from countries with a high incidence of tuberculosis. Having lived in crowded conditions during their travel further increases the likelihood of recent exposure to tuberculosis [83]. The incidence of tuberculosis in migrant children has been reported to be higher compared with non-migrant children in several European countries [70; 99]. Children compared to adults are more likely to progress from tuberculosis infection to disease and develop more severe forms of disease [114]. However, they have excellent outcomes if diagnosed and treated early [68]. Dedicated policies for tuberculosis screening in migrants have a long tradition in many countries but mainly target adult patients [105; 115]. In Greece, latent tuberculosis infection has been detected in 2.7% of migrant children [106]. Further studies in Germany, the United States of America, Australia and New Zealand show a higher prevalence of latent tuberculosis infection of 15% to 24% [40; 72; 118; 147]. The highest rates of latent tuberculosis infection of 60% were found in a study in Spain among adolescent and young adult immigrants from sub-Saharan Africa [124]. Active tuberculosis is however rarely identified in routine screening of migrants [72]. The sensitivity of the tuberculin skin test and interferon gamma release assays to detect active tuberculosis is estimated to be 70-90% [77]. The specificity for interferon gamma release assays is above 95%, but the tuberculin skin test cross reacts in patients immunised with bacille Calmette-Guerin (BCG) vaccine or in those infected with non-tuberculous mycobacteria and its specificity is therefore lower [103].

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 [129]. Several studies have analysed cost-effectiveness for latent tuberculosis in children and adults with the majority showing that screening is cost-effective particularly in young individuals from countries with high tuberculosis incidence [34; 148].

**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 an important risk group for mental health problems [84], 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 very diverse and depend 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 [59]. Most of the children and adolescents will not require treatment as symptoms fade over time in the host country. Referral to child psychiatrist however should be considered when there is significant impairment of daily activities and/or ineffective or harmful coping strategies in the child or family [84].

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 [144]. Worldwide, at least 200 million girls and women have undergone FGM [144]. 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 [132]. 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 [137]. FGM can have serious and long-lasting consequences including genitourinary problems an increased risk of childbirth complications [7; 62], and significant psychological sequelae [139]. 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 [144].

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 chart to minimise the risk loss of information.

**Recommendation 12: Provide the caregiver with a document of the health assessment and interventions and store a copy of this in your records or, if available and compliant with data protection law of your country, in any encrypted digital form enabling both migrants and healthcare institutions to have fast and secure access.**

A summary of all recommendations can be found in **Table 3**.

**Limitations**

This recommendation is based on currently available limited data on migrant health in children. As migrant patterns will change and new evidence will become available some of the specific recommendations will inevitable require adaptation.

**Conclusion**

The current document provides a recommendation based on expert opinion and available evidence for a standard of medical care for migrant children. 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 the receive a comprehensive, patient-centred health care.

**Acknowledgments:**

The author would like to thank Ayesha Kadir and Anders Hjern for helpful comments on the manuscript. We would like to thank René-Marie Meignan for designing the icons.

**Compliance with Ethical Statements**

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

Funding: There is no funding source.

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

**Author contribution**

LS, CW, SdT and NR conceived the manuscript. LS and NR performed the data acquisition and 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.

**What is known" and explain "What is New"**

Not applicable

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**Table 2:** Conditions with recommendations in national clinical guidelines for child migrant care in Europe and selected non-European countries.

| **Country** [Reference] | **DE** [107] | **CH** [8; 38] | **AU** [43] | **UK** [130] | **SP** [85] | **FI** [96] | **IT** [97] | **NL** [39] | **CA** [109] | **US** | **AUS** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Vaccine-preventable infection** | | | | | | | | | | | |
| Measles, mumps, rubella | Complete | Complete | Complete | Complete | Complete | Complete | Complete | Complete | Complete | Complete | Complete |
| Diphteria, pertussis, tetanus, polio | Complete | Complete | Complete | Complete | Complete | Complete | Complete | Complete | Complete | Complete | Complete |
| Varicella infection | | Complete >11 y | Complete, recommended | | | Complete | | | Complete <13 y; screen >13 y | | Complete <14 y; screen ≥ 14 y |
| Haemophilis influenza b infection | Complete | Complete <6 | | | | Complete | Complete | Complete | | | Complete < 5 y |
| Influenza | | | Complete, recommended | | | | | | | | |
| Meningococcus B or C infection | Complete | Complete, recommended | Complete, recommended | | Complete | Complete | Complete | Complete | | | Complete |
| Pneumococcus infection | Complete | Complete, <5 y, recommended | Complete | | | Complete | Complete | Complete | | | Complete, < 5 y |
| Hepatitis A infection | If increase in transaminase | | Screen, all | | Screen | | | | | Be alert | |
| Hepatits 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** | | | | | | | | | | | |

| Country [Reference] | DE [107] | CH [8; 38] | AU [43] | UK [130] | SP [85] | FI [96] | IT [97] | NL [39] | CA [109] | US | AUS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 y; at risk >5 yr | Screen, ≥ 6 y 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 document ation, all | Screen ≥ 15 y, 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 and eosinophili a | | Screen, at risk | Screen or treat, at risk | Screen, at risk |
| Helminth (incl 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 y; screen other ages if at risk | Screen <2 y | | | Screen | Screen, all | | | Screen if no document ation, 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** | | | | | | | | | | | |

| Country [Reference] | DE [107] | CH [8; 38] | AU [43] | UK [130] | SP [85] | FI [96] | IT [97] | NL [39] | CA [109] | US | AUS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 behavorial disturbances | | | | Screen | Be alert | | | Screen | | Be alert | |
| Social support and education | | Evaluate | | Evaluate | Evaluate and inform | | | Evaluate | | | |
| Functional symptoms | | Be alert | | | | | | | | | |
| **Chronic and noncommunicable diseases** | | | | | | | | | | | |
| | | | | | | | | | | | |
| Anemia | Be alert | Be akert | Be alert | Be alert | Be alert | | Be alert | Be alert | | Be alert | Screen, all |
| Iron-deficiency anemia | Screen, suggested | Screen, all | Be alert | | Screen, all Treat, 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, if anemia and at risk | | | Screen, at risk | |
| Nutritional deficiencies | | Be alert | Screen 25/OHD, consider Treat (vit D), all | Be alert | Be alert Screen 25/OH/colecalciferol, 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 3yrs 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 | |

| **Country** [Reference] | **DE** [107] | **CH** [8; 38] | **AU** [43] | **UK** [130] | **SP** [85] | **FI** [96] | **IT** [97] | **NL** [39] | **CA** [109] | **US** | **AUS** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 yrs and older | Screen, all |
| Hearing impairment | Screen, suggested | Screen, all | Screen if concerns | Screen if concerns | | | Screen, all | Screen, newborns | | Screen, newborn and 4 yrs 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 y | Vaccinate, female 11-14 y | Vaccinate, all | | | | | Vaccinate, girls ≥ 12 y | Vaccinate ≥ 9 y | | Vaccinate, adolescents |
| Cervical abnormalities | | | | | | | | | Screen, adolescents | | Standard prevention screening |
| Sexual health (for example. sexual exploitation, female genital mutulation) | Check FGM | Evaluate | | Evaluate and inform | Evaluate and inform | | | Evaluate and inform | | Evaluate and inform | Be aware |
| **Lifestyle-related problems** | | | | | | | | | | | |
| Alcohol, tobacco or drug abuse | | Be alert | | Inform, adolescents | | | | Inform | | | |
| Obesity or malnutrition | | Be alert | | Inform, adolescents | Inform | | | Inform | | Be alert | |

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).* If guidance document specifically included that action was recommended, this is was added to the table. ** if guidance specifically addressed that all or only children at risk should be screened, this information was added to the table.

***Link*** *to complete database on EAP website.*

**Table 3**: **HEALTH-** Acronym, summarizing key questions for practitioners providing health care to asylum-seeking patients

| **Category** | **Questions** |
|---|---|
| **H** ome | Country of birth and/or country of origin?<br>Did (s)he receive health care (incl. 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?<br>Preferred language including dialect?<br>Need of an interpreter?<br>Preference male/ female interpreter? |
| **T** ransition countries | Did the (s)he stop for a longer time in another country?<br>Did (s)he become ill in a transition country?<br>Did (s)he receive health care (incl. screening/prevention)? |
| **H** ost country | Did the (s)het become ill in the host country?<br>Did (s)he receive health care (incl. screening/prevention)?<br>Does (s)he have an allocated primary care physician? |

**Table 3:** Summary of the recommendations

| | | |
|---|---|---|
| **1** |  | Check if the migrant child is accompanied by at least one parent or a responsible caregiver. |
| **2** |  | Check if the parent/carer is capable to communicate sufficiently; access professional interpreter services if limited language proficiency is suspected. |
| **3** |  | Ask about health problems that the parents 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** |  | Treat empirically for intestinal parasites with albendazole. |
| **9** |  | Take a blood sample to measure<br>a) haemoglobin to check for anaemia and treat iron deficiency if present<br>b) HBV-antibodies (Hbs-Ag, anti-Hbs and anti-HBc)<br><br>ADD |

c) if risk factors or signs for nutritional 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 known or forseen: Strongyloides serology
h) if sexually active or abused: Syphilis serology

OPTIONAL

i) HCV-antibodies

**10** 

Perform a tuberculosis screening (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

**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.

**12** 

Provide the caregiver with a document of the health assessment and interventions and store a copy of this in your records or, if available and compliant with data protection law of your country, in any encrypted digital form enabling both migrants and healthcare institutions to have fast and secure access.

## Supplementary Material

**Table 1 & 2 .** Quality of evidence and grades of recommendation (adapted from [87])

| Level | Treatment / Prevention | Prognosis | Diagnosis | Symptom prevalence |
|---|---|---|---|---|
| 1 | RCT or SR from RCT | Validated CDR | Validated CDR | Prospective cohort study |
| 2 | Cohort study | Retrospective cohort study;<br>CDR validated only on split samples | Exploratory cohort study;<br>CDR validated only on split samples | Retrospective cohort study |
| 3 | Case-control study | | Non-consecutive study; or without consistently applied reference standards | Non-consecutive cohort study, or very limited population |
| 4 | Case-series | Case-series | Case-control study | Case-series |
| 5 | Expert opinion | Expert opinion | Expert opinion | Expert opinion |

CDR: clinical decision rule; RCT: randomised controlled trial; SR: systematic review

| Level | Evidence |
|---|---|
| A | Consistent level 1 studies |
| B | Consistent level 2 studies |
| C | Consistent with level 3 and 4 studies |
| D | Level 5 |