REVIEW ARTICLE

Triage and the route of care for pediatric patients in times of Covid-19, Pinar del Rio

Triaje y ruta de atención del paciente pediátrico en tiempos de COVID-19, Pinar del Río

Yatson Jesús Sánchez Cabrera[1], Noslen Márquez Batista[1], Amanda Caridad Peraza Pérez[2]

[1]University of Medical Sciences of Pinar del Río. Provincial Pediatric Hospital Pepe Portilla. Pinar del Río, Cuba.
[2]University of Medical Sciences of Pinar del Río. University Polyclinic Raúl Sánchez Rodríguez. Pinar del Río, Cuba.

Received: 1 march 2021
Accepted: 4 may 2021
Published: 29 may 2021

Citar como: Sánchez Cabrera YJ, Márquez Batista N, Peraza Candelaria AC. Triaje y ruta de atención del paciente pediátrico en tiempos de COVID-19. Pinar del Río. Rev Ciencias Médicas [Internet]. 2021 [citado: fecha de acceso]; 25(3): e4959. Disponible en: http://revcmpinar.sld.cu/index.php/publicaciones/article/view/4959

ABSTRACT

Introduction: in the framework of Covid-19 pandemic the structured triage is an indispensable element to prioritize and define the route of care, guaranteeing a timely assistance which could reduce the exposure of the healthcare personnel and consequently, the spreading of the disease.
Objective: to establish recommendations for the triage and to determine the route of care for pediatric patients attending Pepe Portilla Pediatric Teaching Hospital in the context of Covid-19 pandemic.
Development: particularities in the route of care are introduced considering the pediatric triage, structured by means of the assessment of the triangle used for pediatric evaluation; in addition to the definition for a suspected case of Covid-19, as a basic process for the preliminary-clinical-evaluation in emergency services and establishing two flows of patients: flow 1- suspected case of Covid-19 and flow 2- not suspected case of Covid-19.
Conclusions: the recommendations described are general and each hospital, depending on its characteristics, should decide the most favorable organization to guarantee a care of quality along with the safety of inpatients and outpatients.

Keywords: Triage; Coronavirus Infections; Patient Care; Child; Disease Prevention.

RESUMEN

Introducción: en el marco de la pandemia por COVID-19, el triaje estructurado es un elemento imprescindible para priorizar y definir la ruta de atención, que además de garantizar una asistencia oportuna, podría reducir la exposición del personal de salud y por ende, la transmisión de la enfermedad.
Objetivo: establecer recomendaciones para el triaje y determinar la ruta de atención de los pacientes pediátricos que acuden al Hospital Pediátrico Provincial Pepe Portilla en el contexto de la pandemia por COVID-19.
Desarrollo: se presentan particularidades de una ruta de atención según el triaje pediátrico estructurado a través de la valoración del triángulo de evaluación pediátrica y la definición de caso sospechoso de COVID-19 como procesos básicos de evaluación clínico preliminar en el servicio de urgencias, y se establecen dos flujos de pacientes: flujo 1 para sospechosos de COVID-19 y flujo 2 para no sospechosos de COVID-19.
Conclusiones: las recomendaciones descritas son generales y cada hospital, de acuerdo con sus características, deberá decidir la organización óptima para garantizar una atención de calidad y la seguridad de usuarios internos y externos.

Palabras clave: Triaje; Covid-19; Atención al Paciente; Niño; Prevención de Enfermedades.

Acrónimos:
COVID-19: Entidad causada por el Virus SARS-CoV-2.
SpO_2: Saturación de oxígeno de la hemoglobina.
PCR-TR: Reacción en Cadena de la Polimerasa en Tiempo Real.

INTRODUCTION

According to figures published by the Ministry of Public Health of Cuba, from March 11, 2020 to January 31, 2021, 27592 cases of Covid-19 were confirmed, of which 2882 (10,44 %) corresponded to children and adolescents from 0 to 18 years old. Pinar del Rio has not been oblivious to this reality and up to the same date 192 confirmed children have been reported.[1]

According to the data available so far, children with Covid-19 have a better prognosis than adults; fewer severe cases are reported than in adults, and mild cases recover within 1-2 weeks after disease onset.

Most of the confirmed cases were secondary to exposure to family circle contacts. However, transmission from children to adults and from other children can occur, as has been reflected in a series of pediatric cases in China.[2]

Transmission of the virus from asymptomatic children and a carrier period of up to 21 days have also been demonstrated. These data may explain a higher number of inadvertent infections.[2]

Therefore, children should be involved in routine preventive actions to contain the spread of infection; protection of healthcare professionals is crucial in the assessment and screening of children with respiratory infections.[3]

As the pandemic has expanded, essential information has been added from China, Europe and the United States to overcome Covid-19, including early detection, early diagnosis, immediate isolation and timely treatment.[4]

In the context of the pandemic, in order to comply with the above precepts, secondary care hospitals have rearranged their patient care flowcharts from the emergency department to their final destination in the hospital wards.

The structured triage through the Assessment of Physiological Status (APS), the definition of Acute Respiratory Infection (ARI) and of suspected and confirmed cases of Covid-19, become essential elements to prioritize and define the route of care, which in addition to ensuring timely assistance, could reduce the exposure of healthcare personnel and therefore, the transmission of the disease.[5, 6]

The structured pediatric triage is a preliminary, useful and reproducible clinical evaluation process to prioritize care by degree of emergency, identify vital risk, ensure the reevaluation of patients who must wait, decide the most appropriate area to concentrate them and optimize the quality of care, according to an evaluative and continuously improved quality model.[7, 8]

Due to the high risk of spread of this disease, this research was carried out with the objective of establishing recommendations for triage and determining the route of care for pediatric patients attending Pepe Portilla Pediatric Teaching Hospital in the context of the Covid-19 pandemic.

DEVELOPMENT

1. Triage and route of care of the pediatric patient suspected of presenting Covid-19

1.1. Entry

It is done through a *"single right of entry"* to the emergency department for Acute Respiratory Infections (ARI) created for this purpose and in the general emergency department of the hospital, a pre-classifier was established which refers patients with ARI to the one described above. A notice should be placed at the entrance to clarify that it is NOT advisable children to be accompanied by family members over 60 years of age, people with hypertension, diabetes mellitus, chronic obstructive pulmonary disease, obesity and/or immunocompromised relatives (e.g. chronic renal pathology and cancer), as these are the most vulnerable groups to infection and serious complications.[9, 10]

It is also not recommended, if possible, the entry of pregnant women, to ensure the greatest possible protection of this important social group. Likewise, the area of attention of patients suspected of Covid-19 should be delimited with colored ribbons for the information of any other person who might arrive at the ARI emergency department for any other reason.[10]

The security and safety officer present 24 hours a day at the entrance gate must ensure strict compliance with the following guidelines :[10-12]

- The child must enter with only one companion, preferably the parents.
- All children over two years of age and all accompanying persons must wear a mask or facemask.
- The use of masks or facemask is not recommended for children under two years of age or those who cannot remove them by their own means due to any physical condition. The same strategy will be applied for older children who are difficult to control.
- All children and their companions must disinfect their hands by freezing antiseptic, alcohol 70% or sodium hypochlorite 0.1%, which must be provided upon admission by the health unit.

1.2. Pre-triage

It should be performed immediately after passing the hospital entrance door and its objective is to establish two patient flows: Flow 1 for Covid-19 suspects and Flow 2 for NON Covid-19 suspects, for which the following points should be taken into account:[13, 14]

- The presentation and clinical course of Covid-19 in children is nonspecific. Asymptomatic cases, cases with one or more respiratory symptoms (cough, nasal congestion and sore throat) and/or fever, and cases with non-respiratory symptoms (vomiting, diarrhea and skin lesions) are described.
- The child's possible contact with patients with previous Covid-19.

To establish the two patient flows, the following questions should be asked:

- Answer Yes or No- Does your child have fever or cough or nasal congestion or sore throat?
- Answer Yes or No -Have you been in contact with people diagnosed with Covid-19 in the last 14 days?
- Answer Yes or No - Have you left your home in the last 14 days? Where to? Staff should know if the child was in an area where SARS-CoV-2 virus transmission is in the community. [12]

Once these questions have been answered, the child and the person accompanying him/her will be directed to one of the two flows.

In areas with community transmission of SARS-CoV-2 virus, only the first question is asked

1.2.1. Flow 1 patients with suspected Covid-19 will consist of:

- Children with fever and/or respiratory symptoms.
- Children who have been in contact with patients with Covid-19 or who have been in places where community transmission of the virus has been declared in the last 14 days, regardless of symptoms (in areas with community transmission of the virus, all persons are susceptible to being exposed to the virus even without reporting an epidemiological link).

This group of patients will continue their care in the ARI emergency department, as they should all be redirected to that site.

1.2.2. Flow 2 NON-suspected Covid-19 patients will consist of the rest of the children and will continue their care in the triage area located in the general emergency department of the hospital.

The fact of structuring two flows reduces the exposure between infected and non-infected patients; however, it does not guarantee the same or the initial diagnostic presumption. For this reason, children, accompanying persons and healthcare personnel must strictly comply with the necessary protective measures in all areas. The hospital epidemiology department plays an important role in the control and compliance with these indications.

The following aspects should also be considered:

- Appropriate signal for orientation of internal and external users.
- The person who facilitates the entry and the person who performs the pre-triage only direct the child and the person accompanying him/her.
- It is suggested that the person performing the pre-triage be a nurse, although a technician or graduate from the Department of Epidemiology may be included.
- At the entrance and pre-triage, healthcare personnel should maintain a distance of two meters from the children and their companions, and should strictly comply with hand washing, hand disinfection and use of face masks.[10, 11]

1.3. Triage

It is mandatory that each of the patient flows remain in different waiting rooms at a distance of two meters from each other and is attended by different teams.
Aspects to consider in waiting rooms and triage areas:[12]

- The use of toys or any other object is prohibited to avoid fomites (passive vectors contaminated with the virus).
- Visual information systems with instructions on hand washing and respiratory hygiene should be available. An antiseptic gel dispenser, 70% alcohol or bottle with 0.1% sodium hypochlorite is required, and at the entrance a foot step for disinfection of footwear.
- Healthcare personnel performing triage of pediatric patients may be exposed to respiratory secretion droplets, if it is taken into consideration that they will be less than two meters away from the patients, infants under two years of age will not wear a mask; in addition, children with special conditions and children who are difficult to handle may not wear a mask.
- The personal protective equipment to be used in the triage of the ARI emergency department consists of N95 respirators, safety glasses, long-sleeved gown, cap and disposable gloves. Strict hand hygiene should be adhered to before and after contact with the patient, before donning and after removal of personal protective equipment.

1.3.1- Determine the physiological status of the child in order to prioritize his/her attention according to color code. This will be done through the pediatric assessment triangle. The parameters to evaluate are: appearance, respiratory work and cutaneous circulation. [13, 14] Subsequently, the ABCDE evaluation is performed according to each case, [15] followed by secondary evaluation (questioning and exhaustive physical examination) and tertiary evaluation to obtain greater diagnostic certainty with the support of imaging and laboratory tests.[6, 7]

Aspects to consider:

- In the absence of a specific clinical pattern of Covid-19, it is recommended to use the usual criteria of severity for other causes for hospitalization such as the modified Tal scale. [8]
- Oxygen saturation measured by pulse oximetry.
- Clinical syndromes associated with Covid-19 in pediatric patients.[9, 10]

  - Uncomplicated infections.
  - Mild/severe lower tract infections.
  - Acute Respiratory Distress Syndrome (ARDS) (Rome Criteria).
  - Sepsis / Septic shock.
  - Organ dysfunction associated with severe sepsis: coagulation disorder, myocardial dysfunction, renal, gastrointestinal and rhabdomyolysis.
  - Pediatric multisystem inflammatory syndrome linked to SARS-CoV-2.

- Groups at risk of poor outcome: children with congenital heart disease, diabetes mellitus, sickle cell disease, immunosuppressed, malnourished, obese or chronic lung disease. [11, 12]
- Any measures that generate aerosols and increase the spread of the virus, such as nebulizations or the use of high-flow oxygen devices should be avoided as much as possible (more than five liters of oxygen in high-flow devices is not recommended because they can generate a greater number of aerosols). [13]
- Nebulization is strongly discouraged; if it is absolutely necessary, it should be performed in an area with an outside window with a closed door and personnel should always wear full Personal Protective Equipment (PPE). [14]

1.4. Case definition [15]

1.4.1 Suspected case of Covid-19

- Person of any age presenting fever and cough, accompanied by at least one of the following signs and symptoms: general weakness, fatigue, headache (irritability), myalgia, arthralgia, odynophagia, coryza, rhinorrhea, dyspnea, taste alterations, anosmia, anorexia, vomiting and diarrhea.
- Patient with severe respiratory infection requiring hospitalization.
- Epidemiology:
  - Contact with people who have had the disease.
  - Residing or traveling in an area of community transmission at any time within 14 days prior to symptom onset.

1.4.2 Confirmed case of Covid-19

Person with positive laboratory test (PCR-TR) for SARS-CoV-2 from a nasopharyngeal or oropharyngeal swab specimen performed by the national network of public health care laboratories, regardless of clinical signs and symptoms.

2. Care of the Acute Respiratory Infection- Individualized Treatment

The objective is to achieve hemodynamic stabilization of the patient through the primary evaluation: Pediatric Assessment Triangle - ABCDE and the corresponding individualized treatment for each case.

2.1 Route of Care

It is proposed to be performed on the Assessment of Physiological Status (APS).

- Children with suspected Covid-19 and normal physiological status require: to complete the anamnesis and physical examination, epidemiological notification, to verify the vaccination schedule, continue breastfeeding (infants), perform rapid antigen test and PCR-TR by qualified personnel, if admission is decided according to the guidelines received from the Ministry of Public Health (MINSAP) this is done in isolation hospitalization room designed for the care of the suspected pediatric patient or he/she is referred to an isolation center if he/she is contact of a confirmed Covid-19 case . Always provide guidance on respiratory hygiene and hand washing, social distancing to avoid contagion, recognize signs of danger or alarm, treatment according to the protocol.
- Children with suspected Covid-19 and abnormal physiological status require immediate management in the emergency area exclusively for patients with suspected Covid-19, epidemiological notification, rapid antigen testing and RT-PCR by qualified personnel. These patients require admission to pediatric intensive care wards.

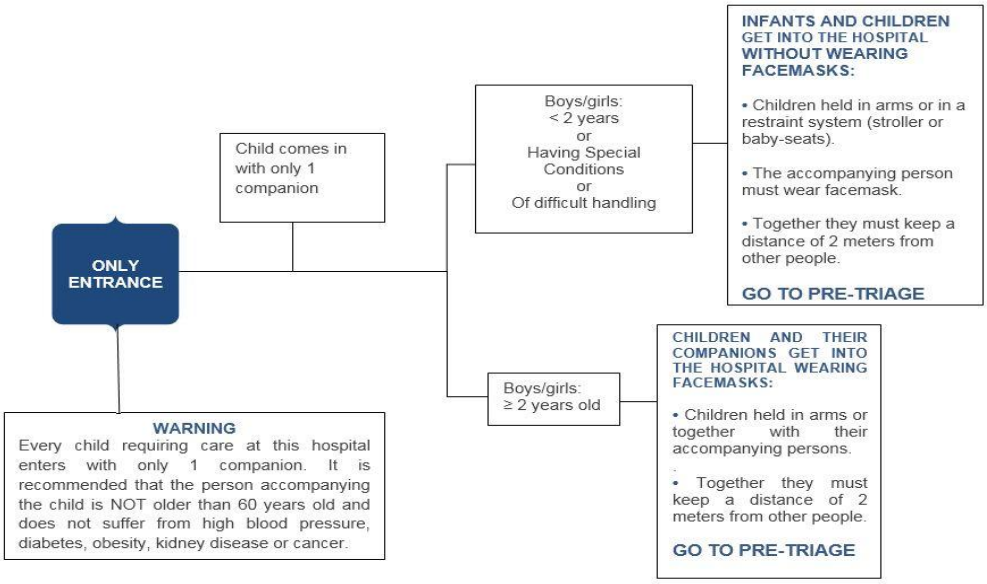
The following aspects should be considered for the organization of emergency areas:[13]

- The two emergency areas: general and exclusive for patients with Covid-19 should have spaces designated for the care of critical patients with all the necessary equipment and supplies for advanced resuscitation.
- Healthcare personnel attending to *"Covid-19 potential patients"* should wear the recommended PPE. It is essential to know the order and correct way to put on and remove each of its components.
- There may be cases in which children in general triage require referral to the emergency area exclusively for patients with Covid-19 and vice versa. In these cases, the referral will be immediate, with the corresponding protective measures and prior telephone communication between the healthcare professionals of the two areas to avoid further exposure to the virus.

3. Flowcharts

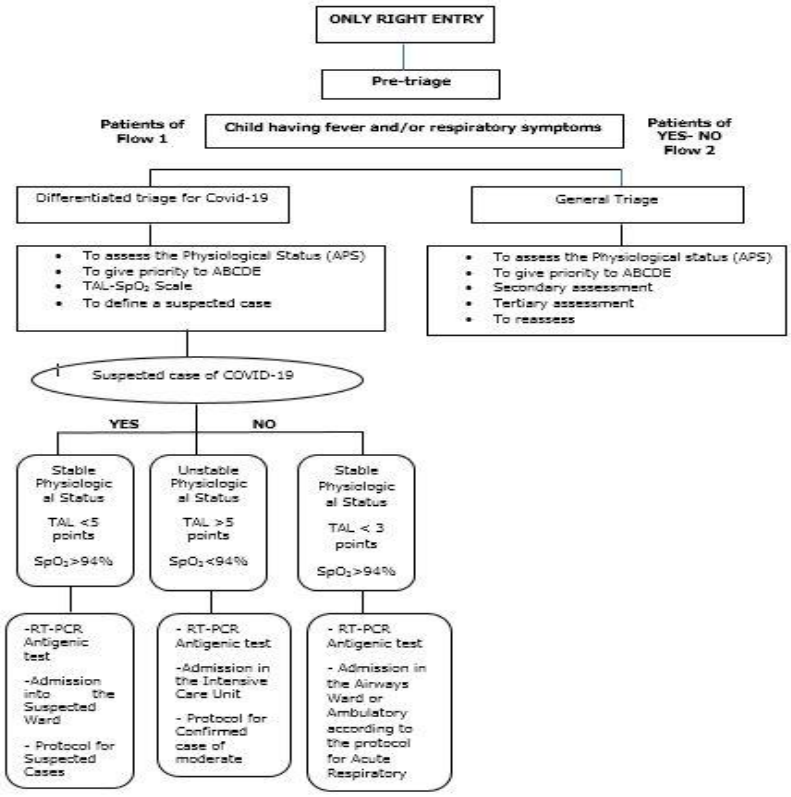
3.1) Pre-triage entry flowchart

Everyone should disinfect their hands with alcohol, 0.1% hypochlorite or gel before entering pre-triage.



Graf. 1 Pre-triage entry flowchart Pepe Portilla Provincial Pediatric Hospital

3.2) Triage and route of care of the pediatric patient suspected of Covid-19



Graf. 2 Triage and route patient suspected of Covid-19

CONCLUSIONS

The fact of structuring two flows reduces the exposure between infected and non-infected patients; however, it does not guarantee the same or the initial diagnostic presumption. Therefore, children should participate in the usual preventive actions to restrain the spread of infection, as well as their companions, and the protection of healthcare professionals is crucial in the assessment and examination of children with respiratory infections. The recommendations described are general and each hospital, according to its characteristics, should decide on the best possible organization to ensure quality care and the safety of internal and external users.

Funding
The authors received no funding to the development of the present research.

Conflict of Interest
The authors declare there is No conflict of interests

Authorship contribution
YJSC, NMB and ACPP: conceptualization, formal analysis, administration of the project, writing-original draft, writing-revision and edition.

BIBLIOGRAPHIC REFERENCES

1. Coronavirus en Cuba, 1 de febrero de 2021 [Internet]. Cecmed. [citado 28/02/2021]. Disponible en: https://www.cecmed.cu/noticias/coronavirus-cuba-1-febrero-2021

2. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. JAMA[Internet]. 2020 [citado 28/02/2021]; 323(13): 1-4 Disponible en: https://www.semanticscholar.org/paper/Characteristics-of-and-Important-Lessons-From-the-a-Wu-McGoogan/97881c6577c310f50fc86738c0268896b970dfa4

3. Jiehao C, Jin X, Daojiong L, Zhi Y, Lei X, Zhenghai Q, et al. A case series of children with 2019 novel Coronavirus infection: Clinical and epidemiological features. Clin Infect Dis. [Internet]. 2020 [citado 28/02/2021]; 71(6): 1547-51. Disponible en: https://academic.oup.com/cid/article/71/6/1547/5766430

4. Wuhan Union Hospital, Huazhon University et all. Care of Pediatric Patients during COVID-19 Pandemic. Wuhan United "Living Through a Pandemic" Series 4. [Internet]. 2020 [citado 28/02/2021]. Disponible en: http://hcpnutramigenhusky-dev.eu-west-1.elasticbeanstalk.com/media/1016/slides-for-care-of-pediatric-patients-during-covid-19-pandemic-04042020.pdf

5. Fernández A, Benito J, Mintegi S. Is this child sick? Usefulness of the Pediatric Assessment Triangle in emergency settings. J Pediatr (Rio J). [Internet]. 2017 [citado 28/02/2021]; 93(Suppl 1): 60-7. Disponible en: https://www.scielo.br/j/jped/a/5d8m7zZKJXcwDV9YM8cgFHx/?lang=en

6. Dieckmann RA, Brownstein D, Gausche-Hill M. The Pediatric Assessment Triangle: A novel approach to pediatric assessment. Pediatr Emerg Care. [Internet]. 2010 [citado 28/02/2021]; 26(4): 312–15. Disponible en: https://pubmed.ncbi.nlm.nih.gov/20386420/

7. Guía de tratamiento de adultos con enfermedad por Coronavirus (SARS-CoV-2) [Internet]. Hospital Universitario. 12 de octubre 2020 [citado 28/02/2021]. Disponible en: https://www.semes.org/wp-content/uploads/2020/03/3.-12-DE-OCTUBRE.pdf

8. Triaje y Ruta de Atención del PACIENTE PEDIÁTRICO en la pandemia COVID-19 [Internet]. Unicef.org. 2020 [citado 28/02/2021]. Disponible en: https://www.unicef.org/ecuador/informes/triaje-y-ruta-de-atenci%C3%B3n-del-paciente-pedi%C3%A1trico-en-la-pandemia-covid-19

9. Actualización de las recomendaciones de la OMS para el uso de mascarillas en el contexto de la COVID-19, tanto en la comunidad como en los centros sanitarios y en la atención domiciliaria - semFYC [Internet]. Semfyc.es. [citado 29/02/2021]. Disponible en: https://www.semfyc.es/grupos/actualizacion-de-las-recomendaciones-de-la-oms-para-el-uso-de-mascarillas-en-el-contexto-de-la-covid-19-tanto-en-la-comunidad-como-en-los-centros-sanitarios-y-en-la-atencion-domiciliaria/

10. Recomendaciones de la SEUP sobre la organización de la asistencia en Urgencias Pediátricas en relación con la infección por SARS-CoV-2 [Internet]. Aeped.es. 2020 [citado 28/02/2021]. Disponible en: https://www.aeped.es/noticias/recomendaciones-seup-sobre-organizacion-asistencia-en-urgencias-pediatricas-en-relacion-con

11. Documento de manejo clínico del paciente pediátrico y pacientes de riesgo con infección por SARS-CoV2 [Internet]. Aeped.es. 2020 [citado 28/02/2021]. Disponible en: https://www.aeped.es/noticias/documento-manejo-clinico-paciente-pediatrico-y-pacientes-riesgo-con-infeccion-por-sars-cov2

12. García-Salido A, Antón J, Martínez-Pajares JD, Giralt Garcia G, Gómez Cortés B, Tagarro A, et al. Documento español de consenso sobre diagnóstico, estabilización y tratamiento del síndrome inflamatorio multisistémico pediátrico vinculado a SARS-CoV-2 (SIM-PedS). An Pediatr (Barc). [Internet]. 2021[citado 28/02/2021]; 94(2): 116.e1-116.e11 Disponible en: https://www.analesdepediatria.org/es-pdf-S1695403320304197

13. Velasco Zúñiga R. Triángulo de Evaluación Pediátrica. Pediatr Integral [Internet]. 2014 [citado 28/02/2021]; XVIII (5): 320-323. Disponible en: https://www.pediatriaintegral.es/wp-content/uploads/2014/xviii05/05/320-323.pdf

14. Fernández Arribas JL. Aproximación y estabilización inicial del niño enfermo o accidentado. Triángulo de evaluación pediátrica. ABCDE. Protoc diagn ter pediatr. [Internet]. 2020 [citado 28/02/2021]; 1: 15-26. Disponible en: https://www.aeped.es/sites/default/files/documentos/02_tep_abcde.pdf

15. Protocolo de actualización Nacional para la COVID-19. La habana [citado 29/02/2021]. 2021 Disponible en: https://files.sld.cu/editorhome/files/2021/03/VERSION_FINAL_6_EXTENDIDA_PROTOCOLO_REVISADA_28_MARZO__2021.pdf