

# Care in Pediatric Oncology

Editors

Patricia Medeiros de Souza José Carlos Martins Córdoba Isis Maria Quezado Magalhães

> Brasilia – DF 2024



#### 2024 Patricia Medeiros-Souza

All rights reserved. Partial or total reproduction of this work is permitted, provided the source is cited and it is not for sale or any commercial purpose.

1st edition – 2024 – electronic version

#### Editors:

Patricia Medeiros de Souza José Carlos Martins Córdoba Isis Maria Quezado Magalhães

#### Content review:

José Carlos Martins Córdoba Patricia Medeiros de Souza

Standardization and layout:

Laura Patrícia da Silva

#### Cover and illustrations:

Nicole Suyane Mauricio de Oliveira

#### Translator:

Silvana Reis e Silva Thees

#### Project funded by the Research Support Foundation (FAPDF) nº 00193-00000897/2021-21.

Catalog Card

Care in pediatric oncology [electronic resource] / editors, Patricia Medeiros de Souza, José Carlos Martins Córdoba, Isis Maria Quezado Magalhães. – Brasília, 2024. 168 p. : il.

Translation of: Cuidados da oncologia pediátrica Includes references. ISBN 978-65-01-15014-7

1. Medical Oncology. 2. Pediatrics. 3. Pharmaceutical Preparations. I. Medeiros-Souza, Patricia, editor. II. Córdoba, José Carlos Martins, editor. III. Magalhães, Isis Maria Quezado, editor. IV. Title.

CDU 616-053.2-006

Catalog card prepared by the Librarian Laura Patrícia da Silva - CRB-1/1711.

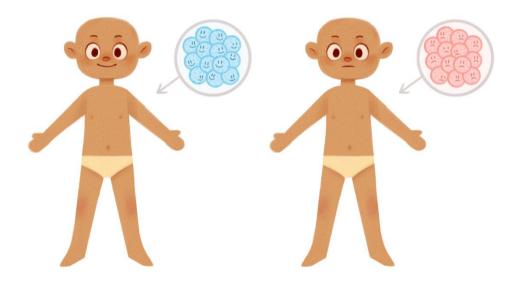
### **CONTENTS**

Presentation	4
Family Care	6
Nutritional Care	
Hand Hygiene	55
Dental Care	60
Storage of Medications	76
Nursing Care: professional	80
Nursing Care: patient	107
Appropriate Disposal of Medicines	119
Vaccines	122
Adverse Reaction of Excipients: A Pediatric Approachr	126
Splitting Antineoplastic Pills	153
List of Contributors	166

## Family Care

Natália Lopes de Freitas Raquel Alves Toscano

Cancer means that, at some point, the cell factory started having problems and began to make cells in a different size. Some are leaving the factory unready, thus causing an unbalance in the body of the child/teenager Park et al., 2020; Uthamacumaran, 2020). Therefore, there is need for treatment, so everything goes back to normal. The most common cancer in children/teenagers is in the blood, although it can happen in other parts (Miller et al., 2020).



Cancer is not the guardian's/caregivers' fault, the result of medication, falling at home, spoiled food, or something the guardians/caregivers have or have not done (The cause of cancer, 2021; Wong et al., 2020). Also, cancer is not contagious: the child/teenager will not pass on the disease to anybody (Park et al., 2020; Uthamacumaran, 2020).

The child/teenager should be informed about what is going on in their body, the necessary procedures and treatment so their cells work again harmoniously, and that sometimes can be long and painful; but they will count on the support of Family and friends (Rodgers et al., 2016; Long, Marsland, 2011; Woodgate, 2006).

The health professionals will use resources such as toys to help detect any problem, clearing any doubt during this period in which the child/teenager is being submitted to

numerous procedures (Jenholt Nolbris, Ahlström, 2014; Prchal, Landolt, 2012; Long, Marsland, 2011).



The World Health Organization (WHO, 2021, 2008) has launched the third global challenge of patient safety, which aims at the participation of the guardian/caregiver in the treatment of the child/teenager. The guardian/caregiver will work as an agent, helping with the treatment, reducing hospital stay by controlling the risks of side effects, thus avoiding the occurrence of errors related to medications, and collaborating on the success of the treatment (Sheikh et al., 2017; WHO, 2017).

The guardian's/caregiver's commitment also includes care in the home with bed linen used by the child/teenager, keeping other people from being contaminated by chemotherapeutic, advising on how to wash the dishes, flush the toilet and partition pills for cancer treatment (WHO, 2021, 2017, 2008; Sheikh et al., 2017).

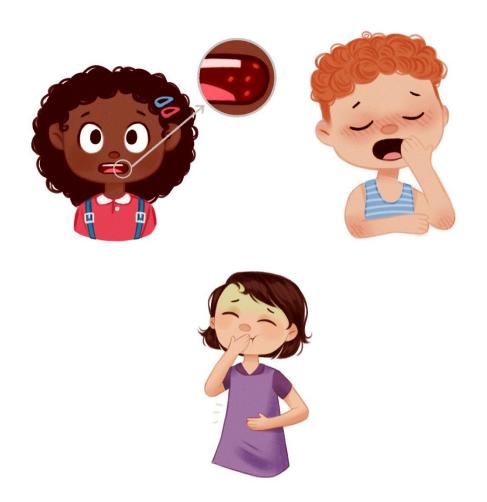
The guardian/caregiver takes on the role of "home sheriff", identifying possible bad effects that can be avoided and by guiding the rest of the family so the treatment is safe and successful to all (Institute of Medicine, 2000).



#### 1 CÂNCER WHAT IS THE TREATMENT LIKE FOR A CHILD/TEENAGER WITH CANCER

The medications for cancer treatment may be most commonly administered through the mouth (orally), under the skin (subcutaneous), in the muscle (intramuscularly) or a vein (intravenous) (Kahn et al., 2017). These medications are called chemotherapeutic, which mix into the blood and travel through the whole body, destroying the bad cells and avoiding the multiplication of defective cells (Urtasun Erburu et al., 2020).

Chemotherapeutic drugs do not cause pain, but the child/teenager may feel the needlestick and, sometimes, uncomfortable sensations such as tiredness (fatigue), burning, itching, rashes, nausea, hair loss, constipation or diarrhea, mouth sores (mucositis), reduced or increased appetite, yellow or red eye, change in the color of pee and poop (red or dark). The child/teenager should be able to trust their guardian/caregivers and, if something happens that they don't think is good, they should inform their doctors (Instituto Nacional do Câncer - INCA, 2022).



The child/teenager does not necessarily show bad effects. The effects depend on each child/teenager and that does not mean the medication did not work or that the patient is not responding to the treatment (INCA, 2022).

The medications should be taken as prescribed by the doctor and at the right times What to do if the patient forgets to take them, if they can or cannot be taken on a full stomach, which other medications can or cannot be taken at the same time should be oriented by the pharmacist, optimizing the treatment (Andrade, 2009). The guardian/caregiver should inform if they use anything at home not prescribed by the doctor, including natural products once they can also cause effects that are not desirable (Garcia-Cortes et al., 2020).

Besides, the guardian/caregiver should also be informed about all the medications the child/teenager has used during the treatment for this data are very important to retrieve any information in a doctor's visit or any other place where the child/teenager is treated, during hospitalization, so the conduct taken is as accurate as possible (Hosoi et al., 2020; Lopes et al., 2000). Information is key in the accuracy of the conducts that should be taken.

The doctor talks, explains and guides the child/teenager and their guardians/caregivers for better understanding and choice of the best treatment, thus increasing adhesion to drug therapy (von Mackensen et al., 2020; Gönderen Çakmak, Uncu, 2020). Seek to increase the

commitment of family to treatment and improve relationships with health professionals (Partanen et al., 2018; Silva, Lima, 2014; Ekstedt et al., 2014).

We have said that the medication for cancer treatment can be taken through the mouth or a vein, but there are other forms of treating cancer, which include a machine that sends rays through the body of the child/teenager (radiotherapy); and/or the doctor might find a surgical procedure necessary to remove the tumor; or a transplant (bone marrow) can be carried on to exchange sick cells for healthy cells (Ministério da Saúde (BR), 2014).



Remember to tell your multiprofessional team about all the medications the child/teenager has been taking for cancer treatment as well as those for domestic use, including natural remedies (phytotherapeutic drugs) and teas (Schümann, Solomons, 2017; Nicoletti et al., 2007). The pharmacist will analyze the occurrence of drug interactions which can interfere in the quantity of chemotherapeutic drugs, decreasing or increasing toxicity (Garcia-Cortes et al., 2020; Schümann, Solomons, 2017; Nicoletti et al., 2007).





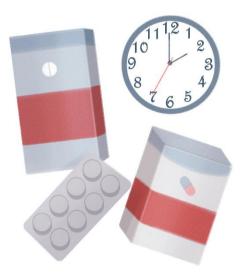
There is a myth that plants do no harm, but that is a lie (Schümann, Solomons, 2017). There are plants which can cause liver damage such as plants to treat anxiety (Kawa-kawa (Garakani et al., 2021) and St. John's Wort (Tokgöz, Altan, 2020)), natural products such as Herbalife<sup>®</sup> (Grigoletto et al., 2016; Zambrone et al., 2015) and Forever<sup>®</sup> (Gonçalves, 2008), which apparently originate from herbs and cannot do any harm. Keep health professionals informed of everything (Roy, 2021; Garcia-Cortes et al., 2020; Schümann, Solomons, 2017).



#### 2 OTHER MEDICATIONS THAT THE CHILD/TEENAGER CAN TAKE

The treatment is individualized. It means that the medication for a child's/teenager's cancer treatment is not the same for another one. The health team is very careful so that the medication takes the expected effect without harming the patient's body too much. Therefore, when you visit the doctor, remember to take a box with all the medications the child/teenager might need to take and that are available at home so it is possible to ask if they

are safe for the child's/teenager's current situation. In the box, Include herbs used for any kind of diseases (Brito et al., 2021; Rodrigo Rincón et al., 2021; Li et al., 2019; Teles et al., 2017; Caccialanza et al., 2016; Poltronieri, Tusset, 2016; Moreira, 2016; Kuritzky, Beecker, 2015; Instituto Desiderata, 2015; Leite et al., 2015; Baracos, Kazemi-Bajestani, 2013; Ministério da Saúde (BR), 2013; Mesna, 2013; INCA, 2016, 2013a, 2013b; Reed et al., 2012; Haidar, Jeha, 2011; Bruining et al., 2011; Barbosa et al., 2010; Gonzáles et al., 2009; Medeiros-Souza et al., 2007; Otero López, 2003; Lopes et al., 2000; Taketomo et al., 1992; Bozzetti et al., 1982) as well as medications for common diseases such as the flu, sore throat.



The child/teenager is not a little adult (Mello, 2004). The child's/teenager's body is in development (Bartelink et al., 2006; Kearns et al., 2003). Thus, when they are born there is more water than fat in their bodies, the medications that can go to the brain boost their penetration, increasing side effects because the barrier is not yet formed (Silva, 2006; Simons, Tibboel, 2006). Besides, after the child/teenager takes the medication, it should be eliminated. There are elements in the liver that break this medication into smaller pieces so the body can send it out through pee or poop (Yang et al., 2009; Bartelink et al., 2006; Mello, 2004; Kearns et al., 2003; Johnson, 2003; Alcorn, McNamara, 2003).

Additionally, there are many other characteristics that should be taken into considerations when it regards the concentration of the chemotherapeutic drug in the child's body, which includes the distribution of water and fat (Katzung, 2005; Alcorn, McNamara, 2003; Labaune, 1993), amount of protein in the blood (Kearns et al., 2003), stomach and bowel movements (Katzung, 2005; Fuchs, 2004; Kearns et al., 2003; Alcorn, McNamara, 2003), amount of blood in the muscles (Bartelink et al., 2006) and the development of some organs (Partanen et al., 2018; Piñeiro-Carrero, Piñeiro, 2004). See how difficult it is to decide on a medication for a child/teenager? (WHO, 2007).

Another aspect we should pay attention to is in relation to other components of the medication called excipients. I will explain: if you eat a chocolate cake, you are interested in the chocolate, but there is also sugar, yeast, eggs that help make the cake. These other components of the cake are called excipients of the medication. Actually, they are components that must be in the medication, but they have no function in treating any symptom, but as the child's/teenager's body is in development, they can have difficulty eliminating the medication, which stays longer in the body causing toxicity (Balbani et al., 2006; European Medicines Agency, 2006; Peres et al., 2005; Heineck et al., 2004; Pifferi, Restani, 2003; Rowe et al., 2000; Napke, Stevens, 1984).

When you get the medication in the hospital for the child's/teenager's cancer treatment, write in a piece of paper the other components, take it to the pharmacist and ask them if it is adequate to the age group, weight, and other health problems the child/teenager has.



#### **3 CARE THAT SHOULD BE TAKEN OF A CHILD/TEENAGER WITH CANCER**

#### <sup>3.1</sup> Body Hygiene

Taking care of hygiene is important to everyone. But in the case of the child/teenager that is undergoing cancer treatment, it is even more important because the child/teenager's system that protects them against bacteria, viruses, and Worms (immune system) is weak. Therefore, lack of the child's/teenager's hygiene may cause various infections and hinder the treatment (Rodrigo Rincón *et al.*, 2021; Teles *et al.*, 2017; Barbosa *et al.*, 2010).

Cares the guardian or caregiver must pay attention to (Rodrigo Rincón *et al.*, 2021; Brito *et al.*, 2021; Teles *et al.*, 2017; Instituto Desiderata, 2015; Mesna, 2013; INCA, 2013a;

Bruining *et al.*, 2011; Barbosa *et al.*, 2010; González *et al.*, 2009; Medeiros-Souza *et al.*, 2007; Otero López, 2003; Takemoto *et al.*, 1992):

- Wear a mask if the doctor asks to;
- Use unscented hygiene products (soap, shampoo, conditioner, combing cream, moisturizer) without perfume;
- For intimate hygiene, use soft toilet paper, when possible, after pooping, perform personal hygiene with soap and water to avoid hurting the area;
- Always wash and dry hands after meals, before and after going to the toilet;
- Trim and clean nails;
- Always brush teeth after meals using a soft-bristle toothbrush, if possible;
- Wash hands first, face and head after, and then belly, back, arms and catheter (if you have one).



#### 3.2 Hygiene of the home

The home is an environment full of contaminants, and because there are other people in contact with the child/teenager, there is risk of other residents transmit diseases (Rodrigo Rincón et al., 2021; Teles et al., 2017; Barbosa et al., 2010).

Cares the guardian or caregiver must pay attention to (Rodrigo Rincón et al., 2021; Brito et al., 2021; Teles et al., 2017; Instituto Desiderata, 2015; Mesna, 2013; INCA, 2013a; Bruining et al., 2011; González et al., 2009; Medeiros-Souza et al., 2007; Otero López, 2003; Takemoto et al., 1992):

• keep the house clean and ventilated;

- keep toys clean washing them frequently, if possible;
- keep carpets and curtains clean;
- discard medications for cancer at the pharmacy in the Hospital or Clinic where treatment is received because they will be treated in an appropriate place (incinerated). The medications which are not for cancer treatment can be discarded at a basic health unit (BHU), collection point or drugstore closer to your home. If there is need for discarding syringes and needles, take them in PET bottles to avoid accidents;



 should the child/teenager use the toilet, flush three times with the toilet lid down on chemotherapy days;



• cleaning of the room should be done with bleach, and everything must be disposed in two tightly-closed plastic bags;



- sanitize the kitchen sponge daily, including the sponge used to clean the knife used to partition the pills. This sponge should be used exclusively to sanitize this knife or utensil used to cut (partition) the pills.
  - Tip 1: Wash the sponge and wring it out to remove as much water as possible (Dória, 2015). After that, let it soak in a recipient full of boiling water for three minutes (Saiba [...], 2019).
  - Tip 2: Mix two tablespoons of bleach with 1 liter of water and leave the sponge submerged in the solution for about 15 minutes (Saiba [...], 2019).

#### **3.3** Pets

Pets are great company for children/teenagers and can emotionally help the child/teenager who is undergoing cancer diagnosis and cancer treatment (INCA, 2016). The guardians and caregivers should observe vaccination, nails, fur and pet hygiene to mitigate the risk of disease transmission and contamination (Moreira et al., 2016; Reed et al., 2012).

Besides, it is not a good idea to touch street animals or animals whose guardians did not knowingly take these precautions, and do not have any contact with wild animals because there is risk that the child catches a disease since the system that protects the body of the child/teenager is weak (Moreira et al., 2016; Reed et al., 2012).



#### 3.4 Make-up

It is very important for the child's/teenager's mental health to maintain their self-care, empowerment, and self-esteem. This way, as long as the make-up is hypoallergenic and does not have methylparaben or propylparaben for these components may alter the child's/teenager's development. But it is very important to read the labels and inform the doctor about makeup use (Leite et al., 2015; INCA, 2013b; Bergman et al., 2013; Final amended [...], 2008).



#### 3.5 Sun protection

All children/teenagers must use sunscreen to prevent diseases caused by excessive solar exposure such as skin cancer, early aging, skin patches, amongst other functions (Li et

al., 2019; Kuritzky, Beecker, 2015). Children/teenagers undergoing cancer treatment should be even more careful because some medications used may cause darkening of the skin When exposed to sunlight, especially on the knee, elbow, and nails (Brito et al., 2021; Cuidados [...], 2021; Instituto Desiderata, 2015; INCA, 2013a).

Thus, the guardians and caregivers must apply sunscreen of SPF 30, at least, on the body parts exposed to the sun or use a black umbrella for the child/teenager to block the sun, wear a hat or a cap as a form of protection, keep the skin hydrated with moisturizer, and avoid exposure to the sun between 10 a.m. and 4 p.m., when the sunlight is stronger (Brito et al., 2021; Cuidados [...], 2021; Instituto Desiderata, 2015; INCA, 2013a).

Therefore, children/teenagers undergoing treatment can go to the beach or the pool, but first they should tell the doctor so they can be advised on the best time to do this and the precautions to be taken. However, they should be protected and use a lot of sunscreen. If, have a fully or semi-implanted catheter, you should avoid bathing in swimming pools, beaches or public bathrooms because of the chance of contamination of the catheter, having to change it (Brito et al., 2021; Cuidados [...], 2021; Instituto Desiderata, 2015; INCA, 2013a).



#### **3.6** Food

Food is a great way to care for the intestine and is extremely important to keep the body healthy because it has all the nutrients needed for the development of the child/teenager (Bozzetti et al., 1982).

Remember to follow the guidance provided by the nutrition team, which takes care of the child/teenager, as many foods need to be carefully sanitized and should be avoided depending on the stage of treatment (Caccialanza et al., 2016; Poltronieri, Tusset, 2016; Baracos, Kazemi-Bajestani, 2013; Ministério da Saúde (BR), INCA, 2013).



#### 3.7 Wounds in the mouth (mucositis)

Wounds in the mouth and throat are very common in the treatment for cancer and can go down to the child's/teenager's intestine in some situations. The wounds look like mouth ulcers, which can be painful and hinder mastication and deglutition of food (Daugėlaitė et al., 2019; He et al., 2018).



Therefore, guardians and caregivers must look every day for wounds in the mouth, and the children/teenagers must brush their teeth with a soft-bristle toothbrush, non-abrasive toothpaste for children; avoid alcoholic beverages, smoking, too much salt in the food and have preference for soft foods until the improvement of the wounds (Ward et al., 2015; Bruining et al., 2011; Barbosa et al., 2010; González et al., 2009).

Keep the multiprofessional team informed because a treatment with laser in the mouth (laser therapy) or drugs to improve the wounds and, consequently, the discomfort caused by them (Daugėlaitė et al., 2019; Hong et al., 2019; He et al., 2018; Carneiro-Neto et al., 2017; Ward et al., 2015).

#### 3.8 Anemia, leukopenia and thrombocytopenia

A quimioterapia que é usada para tratar o câncer não funciona só nas células ruins, ela acaba The chemotherapy used to treat cancer does not work only on the bad cells; it also destroys, unintentionally, some good cells such as those of the blood which transports oxygen (red blood cells), immune system cells that defend the body (white blood cells), and cells that keep us from bleeding too much (platelets). Consequently, the child/teenager will take many blood tests during treatment (Schümann, Solomons, 2017; Knight et al., 2004).

If any of those cells' quantity is low, the child/teenager may have symptoms such as fatigue, shortness of breath, paleness, red dots on the skin, purple and red skin patches, and bleeding (Varlotto, Stevenson, 2005; Knight et al., 2004).



Therefore, guardians and caregivers must keep an eye on these symptoms and take precaution (Brito et al., 2021; Teles et al., 2017; Schümann, Solomons, 2017; Instituto Desiderata, 2015; INCA, 2013a; Medeiros-Souza et al., 2007; Varlotto, Stevenson, 2005; Knight et al., 2004; Otero López, 2003):

• check the skin, mouth, ear, and nose looking for wounds, purple and red patches, red spots, or bleeding;

- remind the child/teenager to brush their teeth using a soft-bridle toothbrush, preferably with toothpaste for children, rinse the toothbrush after using it, and keep it in a different box away from other toothbrushes;
- protect the skin against cuts, especially after waxing or shaving;
- always trim the nails, to avoid possible scratches;
- do not pop pimples;
- always take the temperature if you notice any alteration;
- increase the intake of food of animal origin (beef, chicken, fish), and dark green vegetables (kale, broccoli, spinach, beans, pea) with food that are source of vitamin c (orange, tangerine, lime, acerola);
- avoid milk, cheese, cream cheese, yogurt, and other dairy products near lunchtime or dinner because these foods can "steal" some essential nutrients.

#### 3.9 Vaccines

Vaccines are very important in the formation of the system that protects the child's/teenager's body, so when they become adults, they will be protected against the main diseases. However, children/teenagers undergoing cancer treatment should be careful as to how the vaccine is produced (WHO, 2021; Fundação Oswaldo Cruz - Fiocruz, 2016; Ministério da Saúde (BR), 2015; Toscano, Kosim, 2003).

There are vaccines made from live microorganisms, from dead or inactive components, attenuated viruses, and from genetic material. Thus, while the child/teenager is taking the medication, their defense is lower (reduced immunity), not only might the vaccine not be able to protect them, but it can also cause them other bad effects such as a mild form of the disease or other types of infection (WHO, 2021; Fiocruz, 2016; Toscano, Kosim, 2003).

With that in mind, it is important that the guardian or caregiver inform the doctor which vaccine the child/teenager needs to take, taking the vaccine card into consideration. The doctor will then check if the patient can take that vaccine available at the healthcare facility or if they will have to resort to another kind of vaccine. Besides, it should be verified if their siblings or other children/teenagers in the house can take the missing vaccine (WHO, 2021; Fiocruz, 2016; Ministério da Saúde (BR), 2015; Toscano, Kosim, 2003).

Examples of types of vaccine:

- live microorganisms: COVID-19 (WHO, 2022; Ministério da Saúde (BR), 2021); Human Papillomavirus (HPV) (Zardo et al., 2014);
- compounds or dead/inactive parts: COVID-19 (WHO, 2022; Ministério da Saúde (BR), 2021); Diphtheria and Tetanus (Double Adult dT) (Ministério da Saúde (BR), 2021); Flu (Influenza) (Ministério da Saúde (BR), 2021); Pneumococcal (Pneumo 10,

Pneumo 23) (Ministério da Saúde, 2021); Polio or Infantile Paralysis (IPV) (Ministério da Saúde (BR), 2015); Diphtheria, Tetanus and Pertussis (dTpa) (Ministério da Saúde, 2015); Meningococcal C (Ministério da Saúde, 2015); Hepatitis A (Ministério da Saúde (BR), 2015);

- attenuated virus: COVID-19 (WHO, 2022; Ministério da Saúde (BR), 2021); Polio or Infantile Paralysis (OPV) (Ministério da Saúde (BR), 2021) – in drops (oral); Measles, Rubella e Mumps (MMR) (Ministério da Saúde (BR), 2021); Hepatitis B (Ministério da Saúde (BR), 2021); Yellow Fever (Ministério da Saúde (BR), 2021); Measles and Rubella (MR) (Ministério da Saúde (BR), 2021); Human Rotavirus (HROV) (Ministério da Saúde (BR), 2015); Measles, Mumps, Rubella and Chickenpox (MMRV) (Ministério da Saúde (BR), 2015);
- attenuated bacteria: Pertussis (BCG) (Ministério da Saúde (BR), 2021); Diphtheria, Tetanus, Whooping Cough and Meningitis caused by Haemopilhus (Tetravalent) (Ministério da Saúde (BR), 2021);
- Attenuated bacteria and vírus: Diphtheria, Tetanus and Pertussis, Haemophilus influenzae B Hepatitis B - Pentavalent (DTPa-IPV/Hib) (Ministério da Saúde (BR), 2015);
- genetic material: COVID-19 (WHO, 2022).



#### **4 DAILY ACTIVITIES**

Cancer does not deprive the child/teenager of being in contact with their friends. However, in the beginning of the treatment, the child/teenager may be weaker so leisure time should be restricted until the body is stronger.

Hence, it is necessary to take precaution, so the child/teenager feels well, being the action of the guardians or caregivers extremely necessary to help with these precautions

Here are some guidelines and cares you should avoid as much as possible:

- Avoid getting in contact with people who have any infectious diseases such as chicken pox, the flu, COVID-19 (Brito et al., 2021; Instituto Desiderata, 2015; INCA, 2013a; Cataneo et al., 2011);
- Avoid activities that increase the risk of trauma or falls due to changes that occur in the blood secondary to treatment (Brito et al., 2021; Freguglia, Tolocka, 2018; Castro Filha et al., 2016; Instituto Desiderata, 2015; INCA, 2013a; Dias et al., 2013; Kinsella et al., 2006);
- Avoid too many visits, with different pepleo (Brito et al., 2021; Instituto Desiderata, 2015; INCA, 2013a; Cataneo et al., 2011);
- Avoid crowded places during treatment. If you want to go to the movies or the theater, go to sessions that are emptier (Instituto Desiderata, 2015; Brito et al., 2021; Freguglia, Tolocka, 2018; Castro Filha et al., 2016; INCA, 2013a; Dias et al., 2013; Cataneo et al., 2011; Kinsella et al., 2006);
- Avoid animals which you do not know if they are up to date with their vaccines (Brito et al., 2021; Instituto Desiderata, 2015; INCA, 2013a);
- In the beginning of the treatment, avoid going to school, but the school and the teacher must be asked to send school activities to the carried out at home until a return to in-person activities can occur (Brito et al., 2021; Instituto Desiderata, 2015; INCA, 2013a; Rolim, Góes, 2009; Brasil, 1990);
- Sport and light physical activities should be continued and stimulated, though it should be reduced or interrupted so the system that protects the child's/teenager's body (immune system) is fully recovered (Brito et al., 2021; Freguglia, Tolocka, 2018; Castro Filha et al., 2016; Instituto Desiderata, 2015; INCA, 2013a; Dias et al., 2013; Kinsella et al., 2006).

Guardians and caregivers, we need your help so the cancer treatment is safe so the child/teenager can go back to play normally, such as playing football, run on the street and fly their kites as soon as possible.



When does the child/teenager undergoing cancer treatment should be taken to hospital (Brito et al., 2021; Instituto Desiderata, 2015; INCA, 2013a):

- Fever (equal or superior to 37.8°C);
- Spots, red patches or dark patches on the skin (ecchymosis);
- Persistent bleeding;
- Paleness;
- Tiredness at little effort;
- Shortness of breath;
- Pain or difficulty going to the toilet for pee and/or poop;
- Stomachache of diarrhea;
- Vomiting;
- Persistent pain;
- Vision alteration;
- Change in behavior;
- Contact with people with infectious diseases such as chicken pox, COVID-19.



#### 5 PREPARING FOR PALLIATIVE CARE

Even with the progression in the diagnosis and the cancer treatment, in some cases the doctors can no longer cure the child's/teenager's disease (Parra Sanches et al., 2014). When this moment arrives, the process of palliative care begins, which, according to the WHO, it is the action of actively and totally catering for the child/teenager, in their biopsychosocial and spiritual dimensions since the beginning of the diagnosis, relieving physical, psychological, social, and spiritual suffering, as well as providing family (Parra Sanches et al., 2014; Misko, 2012; Murray et al., 2010; Reis et al., 2009; WHO, 1998).



Religiosity is a way to intensify social support, allowing for better psychological adaptation of the guardians or caregivers, reducing depressive feelings by comforting, supporting for better acceptance of the situation, overcoming obstacles, and dealing with the disease (Parra Sanches et al., 2014; Silva, Acker, 2007).



Hence, there is an approach of attention to health, focusing on quality of life and death (Parra Sanches et al., 2014). Remember that this process is intensely experienced by the guardians or caregivers, with many feelings because after the diagnosis there is a drastic change in all the family structure (Parra Sanches et al., 2014; Silva et al., 2009).

#### REFERENCES

Alcorn J, McNamara PJ. Pharmacokinetics in the newborn. Adv Drug Deliv Rev. 2003 Apr 29;55(5):667-86. doi: 10.1016/s0169-409x(03)00030-9

Andrade CC. Farmacêutico em oncologia: interfaces administrativas e clínicas. Pharmacia Brasileira [Internet]. 2009 mar./abr. [cited 2021 set. 21];1-24. Available from: https://www.cff.org.br/sistemas/geral/revista/pdf/70/encarte\_pb70.pdf

Balbani APS, Stelzer LB, Montovani JC. Excipientes de medicamentos e as informações da bula. Rev Bras Otorrinolaringol. 2006;72(3):400-406. https://doi.org/10.1590/S0034-72992006000300018

Baracos V, Kazemi-Bajestani SM. Clinical outcomes related to muscle mass in humans with cancer and catabolic illnesses. Int J Biochem Cell Biol. 2013 Oct;45(10):2302-8. doi: 10.1016/j.biocel.2013.06.016

Barbosa AM, Ribeiro DM Caldo-Teixeira AS. Conhecimentos e práticas em saúde bucal com crianças hospitalizadas com câncer. Ciênc Saúde Coletiva. 2010;15 (suppl 1);1113-1122. https://doi.org/10.1590/S1413-81232010000700019

Bartelink IH, Rademaker CM, Schobben AF, van den Anker JN. Guidelines on paediatric dosing on the basis of developmental physiology and pharmacokinetic considerations. Clin Pharmacokinet. 2006;45(11):1077-97. doi: 10.2165/00003088-200645110-00003

Bergman A, Heindel JJ, Jobling S, Kidd KA, Zoeller T, editors. State of the science of endocrine disrupting chemicals - 2012. Geneva: World Health Organization; 2013.

Bozzetti F, Migliavacca S, Scotti A, Bonalumi MG, Scarpa D, Baticci F, *et al*. Impact of cancer, type, site, stage and treatment on the nutritional status of patients. Ann Surg. 1982 Aug;196(2):170-9. doi: 10.1097/00000658-198208000-00009

Brasil. Lei nº 8.069, de 13 de julho de 1990. Dispõe sobre o Estatuto da Criança e do Adolescente e dá outras providências. Diário Oficial da União [Internet]. 1990 set. 27 [. Available from: http://www.planalto.gov.br/ccivil\_03/leis/l8069.htm

Brito AC, Oliveira BM, Chagas GM, Trivelato MFGO, Babeto LT, Viana MB. Orientações para o cuidado de crianças com câncer [Internet]. Belo Horizonte: Departamento de Pediatria, Faculdade de Medicina da UFMG; 2021 [cited 2021 ago. 10]. Available from: https://ftp.medicina.ufmg.br/observaped/cartilhas/cartilha-criancas-com-cancer.pdf

Bruining DM, van Roon EN, Graaf H, Hoogendoorn M. Cyclophosphamide-induced symptomatic hyponatraemia. Neth J Med. 2011 Apr;69(4):192-5.

Caccialanza R, Pedrazzoli P, Cereda E, Gavazzi C, Pinto C, Paccagnella A, *et al*. Nutritional support in cancer patients: a position paper from the Italian Society of Medical Oncology (AIOM) and the Italian Society of Artificial Nutrition and Metabolism (SINPE). J Cancer. 2016 Jan 1;7(2):131-5. doi: 10.7150/jca.13818

Carneiro-Neto JN, de-Menezes JD, Moura LB, Massucato EM, de-Andrade CR. Protocols for management of oral complications of chemotherapy and/or radiotherapy for oral cancer: Systematic review and meta-analysis current. Med Oral Patol Oral Cir Bucal. 2017 Jan 1;22(1):e15-e23. doi: 10.4317/medoral.21314

Castro Filha JGL, Miranda AKP, Martins Júnior FF, Costa HA, Figueiredo KRFV, Oliveira Junior MNS, *et al*. Influências do exercício físico na qualidade de vida em dois grupos de pacientes com câncer de mama. Rev Bras Ciênc Esporte. 2016;38(2):107-114. https://doi.org/10.1016/j.rbce.2015.11.008

Cataneo C, Canini SRMS, Castro PTO, Hayashida M, Gir E. Evaluation of the sensitivity and specificity of criteria for isolation of patients admitted to a specialized cancer hospital. Rev Latino-Am Enfermagem. 2011;19(5):1072-1079. https://doi.org/10.1590/S0104-11692011000500003

Cuidados com a pele no verão para quem tem câncer. Revista Abrale On-line. [Internet]. 2021 jul. 28 [cited 2021 set. 20]. Available from: https://revista.abrale.org.br/cuidados-coma-pele-no-verao/

Daugėlaitė G, Užkuraitytė K, Jagelavičienė E, Filipauskas A. Prevention and Treatment of Chemotherapy and Radiotherapy Induced Oral Mucositis. Medicina (Kaunas). 2019 Jan 22;55(2):25. doi: 10.3390/medicina55020025

Dias JJ, Silva APC, Freire RLS, Andrade ASA. A experiência de crianças com câncer no processo de hospitalização e no brincar. REME Rev Min Enferm. 2013;17(3):608-619. http://dx.doi.org/10.5935/1415-2762.20130045

Dória L. Esponja de pia oferece risco à saúde? [Internet]. iSaúde, 2015 ago. 27 [cited 2022 jul. 10]. Available from: https://www.isaude.com.br/noticias/detalhe/noticia/esponja-de-pia-oferece-risco-a-saude/

Ekstedt M, Stenberg U, Olsson M, Ruland CM. Health care professionals' perspectives of the experiences of family caregivers during in-patient cancer care. J Fam Nurs. 2014 Nov;20(4):462-86. doi: 10.1177/1074840714556179

European Medicines Agency. Committee for Medicinal Products for Human use. Reflection paper: formulations of choice for the paediatric population [Internet]. London: European Medicines Agency; 2006 July 28 [cited 2022 set. 7]. Available from: https://www.ema.europa.eu/en/documents/scientific-guideline/reflection-paperformulations-choice-paediatric-population\_en.pdf

Final amended report on the safety assessment of Methylparaben, Ethylparaben, Propylparaben, Isopropylparaben, Butylparaben, Isobutylparaben, and Benzylparaben as used in cosmetic products. Int J Toxicol. 2008;27 Suppl 4:1-82. doi: 10.1080/10915810802548359

Freguglia IO, Tolocka RE. Atividade física e tratamento de câncer em crianças. Rev Med Minas Gerais. 2018;28:e-1964. http://dx.doi.org/10.5935/2238-3182.20180053

Fuchs FD. Farmacocinética clínica. In: Fuchs FD, Wannmacher L, Ferreira MBC, editores. Farmacologia clínica: fundamentos da terapêutica racional. Farmacologia clínica: fundamentos da terapêutica racional. 3. ed. Rio de Janeiro: Guanabara Koogan; 2004.

Fundação Oswaldo Cruz; Instituto de Tecnologia em Imunobiológicos Bio-Manguinhos. Vacinas: as origens, a importância e os novos debates sobre seu uso [Internet]. Rio de Janeiro, 25 jul. 2016 [cited 2021 Apr 8]. Available from: https://www.bio.fio.cruz.br/index.php/br/poticias/1263-yacinas-as-origens-a-importanci

https://www.bio.fiocruz.br/index.php/br/noticias/1263-vacinas-as-origens-a-importancia-eos-novos-debates-sobre-seu-uso?showall=1&limitstart=

Garakani A, Murrough JW, Freire RC, Thom RP, Larkin K, Buono FD, *et al*. Pharmacotherapy of anxiety disorders: current and emerging treatment options. Focus. 2021;19(2):222-242. DOI: 10.1176/appi.focus.19203

Garcia-Cortes M, Robles-Diaz M, Stephens C, Ortega-Alonso A, Lucena MI, Andrade RJ. Drug induced liver injury: an update. Arch Toxicol. 2020 Oct;94(10):3381-3407. doi: 10.1007/s00204-020-02885-1

Gonçalves VZ. Estudo de viabilidade técnica, econômica e financeira da extração e comercialização de um insumo farmacêutico a base de polissacarídeos de *Aloe barbadensis Miller* [dissertação na Internet]. Florianópolis: Centro Tecnológico, Departamento de Engenharia Química e Engenharia de Alimentos, Universidade Federal de Santa Catarina; 2008 [cited 2022 set. 7]. 115 p. Available from:

https://repositorio.ufsc.br/xmlui/bitstream/handle/123456789/92050/262886.pdf?sequenc e=1&isAllowed=y

Gönderen Çakmak HS, Uncu D. Relationship between health literacy and medication adherence of turkish cancer patients receiving oral chemotherapy. Asia Pac J Oncol Nurs. 2020 Sep 14;7(4):365-369. doi: 10.4103/apjon.apjon\_30\_20

González LA, Pons-Estel GJ, Zhang JS, McGwin G Jr, Roseman J, Reveille JD, *et al*. Effect of age, menopause and cyclophosphamide use on damage accrual in systemic lupus erythematosus patients from LUMINA, a multiethnic US cohort (LUMINA LXIII). Lupus. 2009 Feb;18(2):184-6. doi: 10.1177/0961203308098988

Grigoletto A, Chromeck AB, Viana RAM, Genaro SC. Avaliação do consumo de produtos Herbalife<sup>®</sup> nos estudantes universitários em uma universidade de presidente prudente. Rev Saber Acad. 2016;21:10-24.

Haidar C, Jeha S. Drug interactions in childhood cancer. Lancet Oncol. 2011 Jan;12(1):92-9. doi: 10.1016/S1470-2045(10)70105-4

He M, Zhang B, Shen N, Wu N, Sun J. A systematic review and meta-analysis of the effect of low-level laser therapy (LLLT) on chemotherapy-induced oral mucositis in pediatric and young patients. Eur J Pediatr. 2018 Jan;177(1):7-17. doi: 10.1007/s00431-017-3043-4

Heineck I, Camargo AL, Ferreira MBC. Reações adversas a medicamentos. In: Fuchs FD, Wannmacher L, Ferreira MBC, editores. Farmacologia clínica: fundamentos da terapêutica racional. 3. ed. Rio de Janeiro: Guanabara Koogan; 2004. p. 73-85.

Hong CHL, Gueiros LA, Fulton JS, Cheng KKF, Kandwal A, Galiti D, *et al*. Systematic review of basic oral care for the management of oral mucositis in cancer patients and clinical practice guidelines. Support Care Cancer. 2019 Oct;27(10):3949-3967. doi: 10.1007/s00520-019-04848-4

Hosoi H, Nishikawa S, Kida Y, Kishi T, Murata S, Iwamoto M, Toyoda Y, Yamada Y, Ikeda T, Sonoki T. Susceptibility of patients receiving chemotherapy for haematological malignancies to scabies. J Hosp Infect. 2020 Nov;106(3):594-599. doi: 10.1016/j.jhin.2020.08.021

Institute of Medicine (US), Committee on Quality of Health Care in America. To err is human: building a safer health system. Kohn LT, Corrigan JM, Donaldson MS, editors. Washington (DC): National Academies Press (US); 2000.

Instituto Desiderata. Orientações para cuidadores de crianças e adolescentes com câncer [Internet]. Rio de Janeiro: Instituto Desiderata; 2015 [cited 2021 ago. 10]. Available from: https://desiderata.org.br/wp/wp-content/uploads/2018/12/cartilha\_para\_cuidadores.pdf

Instituto Nacional de Câncer José Alencar Gomes da Silva, Divisão de Comunicação Social. Quimioterapia: orientações aos pacientes [Internet]. 3. ed. Rio de Janeiro: INCA; 2013a [cited 2021 ago. 10]. Available from:

https://www.inca.gov.br/sites/ufu.sti.inca.local/files//media/document//quimioterapia-2010.pdf

Instituto Nacional de Câncer José Alencar Gomes da Silva. Capa: Autoestima é fundamental [Internet]. Rede Câncer. 2013b abr. [cited 2021 maio 20];21:24-27. Available from: https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/capa-rede-cancer-21.pdf

Instituto Nacional de Câncer José Alencar Gomes da Silva. Terapia com cães reforça tratamento e ajuda na recuperação de pacientes de todas as idades [Internet]. Rede Câncer. 2016 jul. [cited 2021 set. 20];34:10-15. Available from:

https://www.inca.gov.br/sites/ufu.sti.inca.local/files//media/document//rrc-34-capa-bompra-cachorro.pdf

Instituto Nacional do Câncer. Quais os efeitos colaterais da quimioterapia? [Internet]. [Rio de Janeiro], 2022 jun. 20 [cited 2023 maio 21]. Available from: https://www.gov.br/inca/pt-br/acesso-a-informacao/perguntas-frequentes/quimioterapia

Jenholt Nolbris M, Ahlström BH. Siblings of children with cancer - their experiences of participating in a person-centered support intervention combining education, learning and reflection: pre- and post-intervention interviews. Eur J Oncol Nurs. 2014 Jun;18(3):254-60. https://doi.org/10.1016/j.ejon.2014.01.002

Johnson TN. The development of drug metabolising enzymes and their influence on the susceptibility to adverse drug reactions in children. Toxicology. 2003 Oct 1;192(1):37-48. doi: 10.1016/s0300-483x(03)00249-x

Kahn JM, Athale UH, Clavell LA, Cole PD, Leclerc JM, Laverdiere C, *et al*. How variable is our delivery of information? Approaches to patient education about oral chemotherapy in the Pediatric Oncology Clinic. J Pediatr Health Care. 2017 Jan-Feb;31(1):e1-e6. doi: 10.1016/j.pedhc.2016.06.004

Katzung BG. Farmacologia básica e clínica. 9. ed. Rio de Janeiro: Guanabara Koogan; 2005.

Kearns GL, Abdel-Rahman SM, Alander SW, Blowey DL, Leeder JS, Kauffman RE. Developmental pharmacology--drug disposition, action, and therapy in infants and children. N Engl J Med. 2003 Sep 18;349(12):1157-67. doi: 10.1056/NEJMra035092

Kinsella E, Zeltzer P, Dignan T, Winter J, Breatnach F, Bouffet E. Safety of summer camp for children with chronic and/or life threatening illness. Eur J Oncol Nurs. 2006 Sep;10(4):304-10. doi: 10.1016/j.ejon.2005.12.009

Knight K, Wade S, Balducci L. Prevalence and outcomes of anemia in cancer: a systematic review of the literature. Am J Med. 2004 Apr 5;116 Suppl 7A:11S-26S. doi: 10.1016/j.amjmed.2003.12.008

Kuritzky LA, Beecker J. Sunscreens. CMAJ. 2015 Sep 22;187(13):E419. doi: 10.1503/cmaj.150258

Labaune JP. Farmacocinética. São Paulo: Andrei; 1993.

Leite MAC, Nogueira DA, Terra FS. Avaliação da autoestima em pacientes oncológicos submetidos ao tratamento quimioterápico. Rev Latino-Am Enfermagem. 2015;23(6):1082-9. DOI: 10.1590/0104-1169.0575.2652

Li H, Colantonio S, Dawson A, Lin X, Beecker J. Sunscreen application, safety, and sun protection: the evidence. J Cutan Med Surg. 2019 Jul/Aug;23(4):357-369. doi: 10.1177/1203475419856611

Long KA, Marsland AL. Family adjustment to childhood cancer: a systematic review. Clin Child Fam Psychol Rev. 2011 Mar;114(1):57-88. https://doi.org/10.1007/s10567-010-0082-z

Lopes LF, Camargo B, Bianchi A. Os efeitos tardios do tratamento do câncer infantil. Rev Assoc Med Bras. 2000;46(3):277-284. https://doi.org/10.1590/S0104-4230200000300014

Medeiros-Souza P, Santos-Neto LL, Kusano LT, Pereira MG. Diagnosis and control of polypharmacy in the elderly. Rev Saude Publica. 2007 Dec;41(6):1049-53. doi: 10.1590/s0034-89102006005000050

Mello ED. Prescrição de medicamentos em pediatria. In: Fuchs FD, Wannmacher L, Ferreira MBC, editores. Farmacologia clínica: fundamentos da terapêutica racional. 3. ed. Rio de Janeiro: Guanabara Koogan; 2004. p. 942-948.

Mesna. In: UpToDate Inc. [database on the Internet]. Waltham (MA); 2013 [cited 2014 jul. 01]. Available from: http://www.uptodate.com. Subscription required to view.

Miller KD, Fidler-Benaoudia M, Keegan TH, Hipp HS, Jemal A, Siegel RL. Cancer statistics for adolescents and young adults, 2020. CA Cancer J Clin. 2020 Nov;70(6):443-459. https://doi.org/10.3322/caac.21637 Ministério da Saúde (BR), Secretaria de Atenção à Saúde. Protocolos clínicos e diretrizes terapêuticas na oncologia [Internet]. Brasília: Ministério da Saúde; 2014 [cited 2023 maio 21]. Available from:

https://bvsms.saude.gov.br/bvs/publicacoes/protocolos\_clinicos\_diretrizes\_terapeuticas\_on cologia.pdf

Ministério da Saúde (BR), Secretaria de Ciência, Tecnologia, Inovação e Insumos Estratégicos em Saúde, Departamento de Ciência e Tecnologia. Vacinas em desenvolvimento contra Covid-19: 12 de março de 2021. [recurso eletrônico]. Brasília: Ministério da Saúde; 2021 [cited 2023 Apr 20]. Available from: https://www.gov.br/saude/ptbr/coronavirus/vacinas/pdfs/20210312\_cgpclin\_decit\_sctie\_ms\_vacinas\_em\_desenvolvimen to\_contra\_covid-19-1.pdf

Ministério da Saúde (BR), Secretaria de Vigilância em Saúde. Programa Nacional de Imunização. Brasília; 2015.

Ministério da Saúde (BR); Instituto Nacional de Câncer José Alencar Gomes da Silva. Inquérito brasileiro de nutrição oncológica. Organização Cristiane Aline D'Almeida, Nivaldo Barroso de Pinho. Rio de Janeiro: INCA; 2013.

Misko MD. A experiência da família da criança/adolescente em cuidados paliativos: flutuando entre a esperança e a desesperança em um mundo transformado pelas perdas [doutorado]. São Paulo (SP): Escola de Enfermagem de Ribeirão Preto da USP; 2012.

Moreira RL, Gubert FA, Sabino LMM, Benevides JL, Tomé MABG, Martins MC, *et al*. Terapia assistida com cães em pediatria oncológica: percepção de pais e enfermeiros. Rev Bras Enferm. 2016;69(6):1188–94. https://doi.org/10.1590/0034-7167-2016-0243

Murray SA, Kendall M, Boyd K, Grant L, Highet G, Sheikh A. Archetypal trajectories of social, psychological, and spiritual wellbeing and distress in family caregivers of patients with lung cancer: secondary analysis of serial qualitative interviews. BMJ. 2010;304:c2581. https://doi.org/10.1136/bmj.c2581

Napke E, Stevens DG. Excipients and additives: hidden hazards in drug products and in product substitution. Can Med Assoc J. 1984 Dec 15;131(12):1449-52.

Nicoletti MA, Oliveira-Júnior MA, Bertasso CC, Caporossi PY, Tavares APL. Principais interações no uso de medicamentos fitoterápicos. Infarma. 2007;19(1/2):32-40.

Otero López MJ. Errores de medicación y gestión de riesgos. Rev Esp Salud Pública. 2003;77(5):527-40.

Park JH, Pyun WY, Park HW. Cancer metabolism: phenotype, signaling and therapeutic targets. Cells. 2020 Oct 16;9(10):2308. https://doi.org/10.3390/cells9102308

Parra Sanches MV, Nascimento LC, Lima RAG. Crianças e adolescentes com câncer em cuidados paliativos: experiência de familiares. Rev Bras Enferm. 2014;67(1):28-35. https://doi.org/10.5935/0034-7167.20140003

Partanen E, Lemetti T, Haavisto E. Participation of relatives in the care of cancer patients in hospital - a scoping review. Eur J Cancer Care (Engl). 2018; 27(2):e12821. https://doi.org/10.1111/ecc.12821 Peres KG, Oliveira CT, Peres MA, Raymundo MS, Fett R. Sugar content in liquid oral medicines for children. Rev Saude Publica. 2005 Jun;39(3):486-9. doi: 10.1590/s0034-89102005000300022

Pifferi G, Restani P. The safety of pharmaceutical excipients. Farmaco. 2003 Aug;58(8):541-50. doi: 10.1016/S0014-827X(03)00079-X

Piñeiro-Carrero VM, Piñeiro EO. Liver. Pediatrics. 2004 Apr;113(4 Suppl):1097-106.

Poltronieri TS, Tusset C. Impacto do tratamento do câncer sobre o estado nutricional de pacientes oncológicos: atualização da literatura. Rev Bras Ciênc Saúde. 2016;20(4): 327-332. 2016. DOI:10.4034/RBCS.2016.20.04.10

Prchal A, Landolt MA. How siblings of pediatric cancer patients experience the first time after diagnosis: a qualitative study. Cancer Nurs. 2012 Mar-Apr;35(2):133-40. doi: 10.1097/NCC.0b013e31821e0c59

Reed R, Ferrer L, Villegas N. Curadores naturais: uma revisão da terapia e atividades assistidas por animais como tratamento complementar de doenças crônicas. Rev Latino-Am Enfermagem. 2012;20(3):612-618. https://doi.org/10.1590/S0104-11692012000300025

Reis J, Dias SP, Mazzaia MC. A assistência da criança na atenção básica e sua relação com o diagnóstico tardio do câncer infantil. Rev Bras Ciênc Saúde. 2009;7(20):52-62. https://doi.org/10.13037/rbcs.vol7n20.320

Rodgers CC, Laing CM, Herring RA, Tena N, Leonardelli A, Hockenberry M, *et al*. Understanding effective delivery of patient and family education in pediatric oncology: a systematic review from the Children's Oncology Group. J Pediatr Oncol Nurs. 2016;33(6):432-446. https://doi.org/10.1177/104345421665

Rodrigo Rincón I, Irigoyen Aristorena I, Tirapu León B, Zaballos Barcala N, Sarobe Carricas M, Lobo Palanco J, *et al*. Patients and relatives as auditors of safe practices in oncology and hematology day hospitals. BMC Health Serv Res. 2021 Jan 7;21(1):31. doi: 10.1186/s12913-020-06018-3

Rolim CLA, Góes MCR. Crianças com câncer e o atendimento educacional nos ambientes hospitalar e escolar. Educ Pesqui. 2009;35(3):509-523. https://doi.org/10.1590/S1517-97022009000300007

Rowe RC, Sheskey PJ, Owen SC, editors. Handbook of pharmaceutical excipients. 3rd ed. Grayslake (IL): Pharmaceutical Press; 2000. p. 7-9, 38-413, 146-153, 340-344, 392-398, 454-459, 471-473, 485-486, 490-492, 515-518, 539-543.

Roy A. Plumbagin: a potential anti-cancer compound. Mini Rev Med Chem. 2021;21(6):731-737. doi: 10.2174/1389557520666201116144421

Saiba como manter a esponja da cozinha limpa em 5 passos [Internet]. Blog Condor, abril 4, 2019 [cited 2022 jul. 5]. Available from: https://condor.ind.br/blog/limpeza/saiba-comomanter-a-esponja-da-cozinha-

limpa.html#:~:text=Depois%20de%20lavar%20a%20lou%C3%A7a,para%20deix%C3%A1%2Dl a%20completamente%20seca.&text=Para%20garantir%20a%20limpeza%20e,lave%2Da%20e xclusivamente%20com%20detergente

Schümann K, Solomons NW. Perspective: What makes it so difficult to mitigate worldwide anemia prevalence? Adv Nutr. 2017 May 15;8(3):401-408. doi: 10.3945/an.116.013847

Sheikh A, Dhingra-Kumar N, Kelley E, Kieny MP, Donaldson LJ. The third global patient safety challenge: tackling medication-related harm. Bull World Health Organ. 2017;95:546-546A. http://dx.doi.org/10.2471/BLT.17.198002

Silva CAM, Acker JIBV. O cuidado paliativo domiciliar sob a ótica de familiares responsáveis pela pessoa portadora de neoplasia. Rev Bras Enferm. 2007;60(2):150-4. https://doi.org/10.1590/S0034-71672007000200005

Silva FAC, Andrade PR, Barbosa TR, Hoffmann MV, Macedo CR. Representação do processo de adoecimento de crianças e adolescentes oncológicos junto aos familiares. Esc Anna Nery Rev Enferm. 2009;13(2):334-41. https://doi.org/10.1590/S1414-81452009000200014

Silva MM, Lima LS. Participation of the family in hospital-based palliative cancer care: Perspectives of nurses. Rev Gaucha Enferm. 2014;35(4):14-19. https://doi.org/10.1590/1983-1447.2014.04.45820

Silva P. Farmacologia básica e clínica. 6. ed. Rio de Janeiro: Guanabara Koogan; 2006. p. 1186-96.

Simons SH, Tibboel D. Pain perception development and maturation. Semin Fetal Neonatal Med. 2006 Aug;11(4):227-31. doi: 10.1016/j.siny.2006.02.010

Taketomo CK, Hodding JH, Kraus DM. Pediatric dosage handbook. Hudson, OH: Lexi-Comp; 1992.

Teles KM, Medeiros-Souza P, Lima FAC, Araújo BG, Lima RAC. Rotina de administração de ciclofosfamida em doenças autoimunes reumáticas: uma revisão. Rev Bras Reumatol. 2017;57(6):596-604. https://doi.org/10.1016/j.rbr.2016.04.009

The cause of cancer. JAMA. 2021 Jan 19;325(3):311. doi: 10.1001/jama.2020.17762

Tokgöz HB, Altan F. Hypericum perforatum L.: a medicinal plant with potential as a curative agent against obesity-associated complications. Mol Biol Rep. 2020 Nov;47(11):8679-8686. doi: 10.1007/s11033-020-05912-7

Toscano C, Kosim L. Cartilha de vacinas: para quem quer mesmo saber das coisas. Brasília: Organização Pan-Americana da Saúde; 2003.

Urtasun Erburu A, Herrero Cervera MJ, Cañete Nieto A. Cancer in the first 18 months of life. An Pediatr (Barc). 2020;93:358–366. https://doi.org/10.1016/j.anpede.2020.02.006

Uthamacumaran A. Cancer: A turbulence problem. Neoplasia. 2020 Dec;22(12):759-769. https://doi.org/10.1016/j.neo.2020.09.008

Varlotto J, Stevenson MA. Anemia, tumor hypoxemia, and the cancer patient. Int J Radiat Oncol Biol Phys. 2005 Sep 1;63(1):25-36. doi: 10.1016/j.ijrobp.2005.04.049

von Mackensen S, Schleicher C, Heine S, Graf N, Eichler H. Health-related quality of life, treatment satisfaction and adherence outcomes of haemophilia patients living in a German rural region. Hämostaseologie. 2020;40(5):631-641. doi: 10.1055/a-1141-1175

Ward EJ, Henry LM, Friend AJ, Wilkins S, Phillips RS. Nutritional support in children and young people with cancer undergoing chemotherapy. Cochrane Database Syst Rev. 2015 Aug 24;2015(8):CD003298. doi: 10.1002/14651858.CD003298.pub3

Wong M, Mayoh C, Lau LMS, Khuong-Quang DA, Pinese M, Kumar A, *et al*. Whole genome, transcriptome and methylome profiling enhances actionable target discovery in high-risk pediatric cancer. Nat Med. 2020 Nov;26(11):1742-1753. doi: 10.1038/s41591-020-1072-4

Woodgate RL. Siblings' experiences with childhood cancer: a different way of being in the family. Cancer Nurs. 2006 Sep-Oct;29(5):406-14. doi: 10.1097/00002820-200609000-00010

World Health Organization. Cancer pain relief and palliative care in children [Internet]. Geneva: World Health Organization; 1998 [cited 2021 set. 7]. Available from: https://apps.who.int/iris/handle/10665/42001

World Health Organization. Coronavirus disease (COVID-19): Vaccines [Internet]. Geneva, 17 May 2022 [cited 2021 Apr 8]. Available from:https://www.who.int/news-room/q-adetail/coronavirus-disease-(covid-19)-vaccines

World Health Organization. Global priorities for research in patient safety [Internet]. Geneva: World Health Organization; 2008 [cited 2023 maio 21]. Available from: https://www.who.int/publications/i/item/WHO-IER-PSP-2008.13.

World Health Organization. Towards eliminating avoidable harm in health care [Internet]. Geneva: World Health Organization; 2021 [cited 2023 maio 21]. Available from: https://www.who.int/publications/m/item/the-final-draft-of-the-global-patient-safetyaction-plan

World Health Organization. Vaccines and immunization: What is vaccination? [Internet]. Geneva, 30 Aug. 2021 [cited 2021 Apr 8]. Available from: https://www.who.int/news-room/q-a-detail/vaccines-and-immunization-what-is-vaccination

World Health Organization. WHO launches global effort to halve medication-related errors in 5 years [Internet]. Geneva, 2017 Mar 29 [cited 2023 maio 21]. Available from: https://www.who.int/news/item/29-03-2017-who-launches-global-effort-to-halve-medication-related-errors-in-5-years

World Health Organization. WHO model list of essential medicines for children. First List, Oct. 2007. Geneva: WHO; 2007.

Yang D, Pearce RE, Wang X, Gaedigk R, Wan YJ, Yan B. Human carboxylesterases HCE1 and HCE2: ontogenic expression, inter-individual variability and differential hydrolysis of oseltamivir, aspirin, deltamethrin and permethrin. Biochem Pharmacol. 2009 Jan 15;77(2):238-47. doi: 10.1016/j.bcp.2008.10.005

Zambrone FAD, Corrêa CL, Amaral LMS. A critical analysis of the hepatotoxicity cases described in the literature related to Herbalife<sup>®</sup> products. Braz J Pharm Sci. 2015;51(4):785-796. https://doi.org/10.1590/S1984-82502015000400004

Zardo GP, Farah FP, Mendes FG, Franco CAGS, Molina GVM, Melo GN, *et al*. Vacina como agente de imunização contra HPV. Ciênc Saúde Coletiva. 2014;19(9):3799-3808. https://doi.org/10.1590/1413-81232014199.01532013

## List of Contributors

#### **Alessandra Rodrigues Cunha**

Graduated in Pharmacy from the University of Brasilia.

Ana Carolina Bezerra Almeida Nurse at the Children's Hospital of Brasilia José Alencar.

#### Ana Catarina Fernandes Figueredo

Pharmacist R2 of the multidisciplinary residency program in oncology at the Institute of Strategic Health Management of the Federal District.

Ana Flávia Lacerda de Carvalho

Dentist at the Children's Hospital of Brasilia José Alencar.

Bárbara Blom de Almeida

Student of the Pharmacy Course at the University of Brasilia.

#### Bruna Galvão Batista

Student of the Pharmacy Course at the University of Brasilia.

#### Carolina Ferreira Tiago

Pharmacist, specialist in Clinical Pharmacology from the University of Brasília and pharmacist at the Air Force Hospital in Brasília.

#### Cinthia Gabriel Meireles

Research Fellow Havard Medical School.

#### Cláudia Valente

Pediatrician at the José Alencar Children's Hospital in Brasília.

#### Fernanda Angela Rodrigues Costa

Nurse at the Federal District State Health Department.

#### Flávia de Passos

Dentist at the Children's Hospital of Brasilia José Alencar.

#### Igor Alves Mota de Lima

Graduated in Pharmacy from the University of Brasilia, specialist in Clinical Pharmacy in Oncology.

#### Isis Maria Quezado Magalhães

Pediatric hematologist and oncologist, Technical Director of the José Alencar Children's Hospital of Brasília.

#### Janaína Lopes Domingos

Graduated in Pharmacy and Biochemistry from the Federal University of Juiz de Fora. Specialist in Clinical Pharmacology from the University of Brasília. Master in Pharmacology from the Federal University of Ceará. Works as a Specialist in Regulation and Health Surveillance at the National Health Surveillance Agency since 2007.

#### José Carlos Martins Córdoba

Pediatric hematologist and oncologist at CETTRO PETTIT. Pediatric hematologist at the State Department of Health of the Federal District – Children's Hospital of Brasília José Alencar.

#### Kimberly Keffany Batista Miranda

Graduated in Pharmacy from the University of Brasília, mestranda do Programa de Ciências Farmacêuticas da UnB.

#### Luíza Habib Vieira Garcia

Graduated in Pharmacy from the University of Brasilia.

#### Marcilio Sérgio Soares da Cunha Filho

Associate Professor of Pharmacotechnics and Drug Technology at the Pharmacy Course at the University of Brasília.

Maria Luíza Mello Roos

Graduated in Pharmacy from the University of Brasilia.

#### Maria Luíza Mendes Moreira Franco

Graduated in Pharmacy from the University of Brasilia.

#### Mariana Fonseca de Andrade

Graduated in Pharmacy from the University of Brasília, resident in Oncology and Hematology at the Hospital de Clínicas Complex of the Federal University of Paraná.

#### Matheus Galvão Alvares

Graduated in Pharmacy from the University of Brasilia.

**Michele Batista Spencer Holanda Arantes** Pediatrician at the José Alencar Children's Hospital in Brasília.

Mirela Fernandes Tamashiro Justi Bego Dentist at the Children's Hospital of Brasilia José Alencar.

**Monica Virginia Edugwu Akor** Graduated in Pharmacy from the University of Brasilia.

Nádia Dias Gruezo

Nutritionist at the José Alencar Children's Hospital in Brasília.

#### Natália Lopes de Freitas

Graduated in Pharmacy from the University of Brasilia and was a student of the Stricto Sensu Program in Health Science at the University of Brasília.

#### Nicolas Silva Costa Gonçalves

Student of the Pharmacy Course at the University of Brasilia.

#### Patricia Medeiros de Souza

Associate Professor of Pharmaceutical Assistance at the Pharmacy Course at the University of Brasília.

#### Paulo José Ferreira de Freitas

Graduated in Pharmacy from the University of Brasilia.

#### **Raquel Alves Toscano**

Pediatrician at the José Alencar Children's Hospital in Brasília.

#### Valéria Grandi Feil

Graduated in Pharmacy from the Federal University of Paraná and Specialist in Public Administration from Faculdade Padre João Bagozzi and in Oncology from IBPEX.