CARE OF AT-RISK / HIGH-RISK / SICK PRE-SCHOOLER

I. LEUKEMIA

- A hematological malignancy or a cancer of the blood, which develops in the bone marrow.
- **Childhood Leukemia** is the most common childhood cancer.

Types

Acute Leukemia typically develops and worsens quickly (over periods of days to weeks).The vast majority of childhood leukemia is acute.

Chronic Leukemia develops over a slower period of time (months), but is more difficult to treat than acute leukemia, and is more common in adults than in children.

The following are some of the main types of leukemia that occur in children:

1. ***Acute Lymphoblastic Leukemia (ALL)***
   - The most common form childhood leukemia, which makes up 75-80% of childhood leukemia diagnoses.
   - A form of leukemia that affects the lymphocytes, a type of White Blood Cells (WBC) which fights infection. When a patient has ALL, the bone marrow makes too many immature WBC and they do not mature correctly. These WBC also do not work correctly to fight infection. The WBC over-produce, crowding the other blood cells in the bone marrow.
2. ***Acute Myelogenous Leukemia (AML)***
   - Accounts for most of the remaining cases of leukemia in children, comprising about 20% of childhood leukemia.
   - A cancer of the blood in which too many myeloblasts (immature WBC) are produced in the bone marrow. The marrow continues to produce abnormal cells that crowd the other blood cells and do not work properly to fight infection.
3. ***Acute Promyelocytic Leukemia (APL)***
   - A specific type of AML.
   - In this leukemia, promyelocytes are produced and build up in the bone marrow.
   - A specific chromosome translocation (a type of genetic change) is found in patients with APL. Genes on chromosome 15 change places with genes on chromosome 17. This genetic change prevents the promyelocytes from maturing properly.
4. ***Chronic Myelogenous Leukemia (CML)***
   - A chronic leukemia that develops slowly, over months to years.
   - CML is rare in children, but does occur.
   - CML patients have too many immature WBC being produced, and the cells crowd the other healthy blood cells.
   - A chromosome translocation occurs in patients with CML. Part of chromosome 9 breaks off and attaches itself to chromosome 22, facilitating exchange of genetic material between chromosomes 9 and 22. The rearrangement of the chromosomes changes the positions and functions of certain genes, which causes uncontrolled cell growth.
5. ***Chronic Lymphocytic Leukemia (CLL)***
   - Another form of chronic leukemia, but is extremely rare in children.
6. ***Juvenile Myelomonocytic Leukemia (JMML)***
   - A form of leukemia in which myelomonocytic cells are overproduced.
   - It is sometimes considered a myeloproliferative neoplasm.
   - It is rare and most commonly occurs in children under the age of four.
   - In JMML, the myelomonocytic cells produced by the bone marrow and invade the spleen, lungs, and intestines.

Signs and Symptoms

Continuous weight loss
Headache, persistent nausea and vomiting with or without seizure
Increased swelling or persistent pain in bones, joints, back or legs
Lump or mass (swollen lymph nodes) – abdomen, neck, chest, armpits
Development of rash, bleeding, bruises (including petechiae)

Constant / recurrent infections
Abdominal pain or fullness, which may cause shortness of breath or loss of appetite
Noticeable paleness of skin
Constant tiredness
Eye or vision changes
Recurrent or persistent fever

Causes

- The exact cause of most cases of childhood leukemia is not known.
- Most children with leukemia do not have any known risk factors.

Diagnosis

- ***Bone Marrow Aspiration*** and ***Biopsy*** to look for and collect leukemia cells. In aspiration, a fluid sample is removed from the marrow. In biopsy, bone marrow cells are removed. Usually both procedures are performed at the same time and used together to help with diagnosis.
- ***Immunophenotyping*** and ***Cytognetic Analysis*** are performed on the cells to further determine the type and subtype of leukemia.
- ***Complete Blood Count (CBC)***, which is a measurement of size, number, and maturity of different blood cells in blood.
- ***Blood Tests*** may include blood chemistry, evaluation of liver and kidney functions, and genetic studies.
- ***Spinal Tap***. A special needle is placed into the lower back into the spinal canal. A small amount of CSF is sent for testing to determine if leukemia cells are present.

Treatment

Four Standard Treatment:

1. ***Chemotherapy***. A treatment that uses chemicals to interfere with the cancer cells ability to grow and reproduce. Chemotherapy can be used alone or in combination with other therapies. Chemotherapy can be given either as a pill to swallow orally, an injection into the fat or muscle, and through an IV directly into the bloodstream or directly into the spinal column.
2. ***Stem Cell Transplant.*** A process in which the blood-forming cells that are abnormal (like leukemia cells) or that were destroyed by chemotherapy are replaced with healthy new blood-forming cells.
   - A stem-cell transplant can help the human body produce more healthy WBC, RBC, or platelets.
   - It also reduces the risk of life-threatening conditions such as anemia or hemorrhage.
   - Stem cell transplants can be done by obtaining cells from the bone-marrow, blood or umbilical cord blood.
   - Stem cell transplants can use the cells from one's self, called an **autologous** stem cell transplant or they can use cells from another person, known as an **allogenic** stem cell transplant. The type used in childhood leukemia is typically allogenic. The donors used must be a match to the child getting the transplant.
3. ***Radiation Therapy***. Uses various types of radiation to kill cancer cells.
4. ***Targeted Therapy.*** The use of medication to specifically kill the cancerous cells. The medication is able to leave healthy normal cells alone while it targets the cancer.
5. ***Immunotherapy.*** A type of therapy that uses the child's own immune system to fight the cancer. This therapy is currently in clinical trials.

II. WILM'S TUMOR (NEPHROBLASTOMA)

- A cancerous tumor in the cells of the kidney. Fortunately, with the right treatment, Wilms tumor is highly treatable.

Sign and Symptoms

1. An abdominal mass you can feel
2. Abdominal swelling
3. Abdominal pain

Other signs and symptoms may include:

4. Fever
5. Blood in the urine
6. Nausea or vomiting or both
7. Constipation
8. Loss of appetite
9. Shortness of breath
10. High blood pressure

Risk Factors

- ***African-American race*.** In the United States, African-American children have a slightly higher risk of developing Wilms' tumor than children of other races. Asian-American children appear to have a lower risk than children of other races.
- ***Family history***

Wilms' tumor occurs more frequently in children with certain abnormalities or syndromes present at birth, including:

- ***Aniridia*.** In aniridia, the iris – the colored portion of the eye – forms only partially or not at all.
- ***Hemihypertrophy*** means one side of the body or a part of the body is noticeably larger than the other side.

Wilms' tumor can occur as part of rare syndromes, including:

- ***WAGR syndrome*.** This syndrome includes Wilms' tumor, aniridia, genital and urinary system abnormalities, and intellectual disabilities.
- ***Denys-Drash syndrome*.** This syndrome includes Wilms' tumor, kidney disease and male pseudohermaphroditism, in which a boy is born with testicles but may exhibit female characteristics.
- ***Beckwith-Wiedemann syndrome*.** Children with this syndrome tend to be significantly larger than average (macrosomia). Other signs may include abdominal organs that jut out into the base of the umbilical cord, a large tongue (macroglossia), enlarged internal organs and ear abnormalities.

III. ASTHMA

- A chronic disease involving the airways in the lungs. These airways, or bronchial tubes, allow air to come in and out of the lungs.
- In childhood asthma, the lungs and airways become easily inflamed when exposed to certain triggers, such as inhaling airborne pollen or catching a cold or another respiratory infection.

Risk Factors

- Exposure to tobacco smoke
- Previous allergic reactions, including skin reactions, food allergies or hay fever (allergic rhinitis)
- A family history of asthma, allergic rhinitis, hives or eczema
- Living in an urban area with increased exposure to air pollution
- Obesity
- Respiratory conditions, such as a chronic runny or stuffy nose (rhinitis), inflamed sinuses (sinusitis) or pneumonia

- Heartburn (gastroesophageal reflux disease, or GERD)
- Being male
- Being black

Signs and Symptoms

- Frequent, intermittent coughing
- A whistling or wheezing sound when exhaling
- Shortness of breath
- Chest congestion or tightness
- Chest pain, particularly in younger children

Other signs and symptoms of childhood asthma include:
- Trouble sleeping caused by shortness of breath, coughing or wheezing
- Bouts of coughing or wheezing that get worse with a respiratory infection, such as a cold or the flu.
- Delayed recovery or bronchitis after a respiratory infection
- Trouble breathing that may limit play or exercise
- Fatigue, which can be caused by poor sleep

Diagnosis

- History of recurrent or persistent wheeze
- Presence of allergies or family history of asthma and allergies
- Absence of physical findings that suggest an alternative diagnosis
- Tests that support the diagnosis (e.g. Spirometry in children able to perform the test)
- A consistent clinical response to an inhaled bronchodilator or preventer.

It can be difficult to diagnose asthma with certainty in children aged 0–5 years, because:
- Episodic respiratory symptoms such as wheezing and cough are very common in children, particularly in children under 3 years
- Objective lung function testing by spirometry is usually not feasible in this age group
- A high proportion of children who respond to bronchodilator treatment do not go on to have asthma in later childhood (e.g. by primary school age).

Types of Asthma:

1. ***Allergic Asthma***
   a. Animal
   b. Dust mite
   c. Food (Food allergies rarely make asthma worse)
   d. Latex
   e. Mold
   f. Pollen
2. ***Nocturnal Asthma.*** Worsening of asthma at night is very common.
   - Exposure to allergens in the bedroom, particularly dust mites
   - Delayed allergic response, which may occur three to eight hours after exposure
   - Chronic sinus problems and/or post-nasal drip
   - Gastroesophageal reflux
   - Airway cooling from a drop in body temperature
   - Decreased effect of medications during early morning hours
   - Sleep apnea - brief, repetitive cessation of breathing during sleep caused by an upper airway obstruction.

IV. URINARY TRACT INFECTION (UTI)

- An infection in any part of the urinary system – kidneys, ureters, bladder and urethra. Most infections involve the lower urinary tract – the bladder and the urethra.

- Women are at greater risk of developing a UTI than are men.

Signs and Symptoms

UTIs don't always cause signs and symptoms, but when they do they may include:

– Passing frequent, small amounts of urine
– Urine that appears cloudy
– Strong-smelling urine

PART / TYPE	SIGNS AND SYMPTOMS
Kidneys / Acute Pyelonephritis	– Upper back and side (flank) pain – High fever – Shaking and chills – Nausea – Vomiting
Bladder / Cystitis	– Pelvic pressure – Lower abdomen discomfort – Frequent painful urination – Blood in urine
Urethra / Urethritis	– Burning sensation with urine discharge

Risk factors

1. ***Female***
   - Female anatomy
   - Sexual activity
   - Certain types of birth control (diaphragm)
   - Menopause
2. ***Urinary tract abnormalities***
   - Babies born with urinary tract abnormalities that don't allow urine to leave the body normally or cause urine to back up in the urethra.
3. ***Blockages in the urinary tract***
   - Kidney stones or an enlarged prostate can trap urine in the bladder.
4. ***Suppressed immune system***
   - Diabetes and other diseases that impair the immune system – the body's defense against germs.
5. ***Catheter use***
6. ***Recent urinary procedure***
   - Urinary surgery or an exam of the urinary tract that involves medical instruments.

Diagnosis

1. Urinalysis
2. Utrasound
3. ***Voiding Cystourethrogram (VCUG).***
   - Places fluid into the bladder through a tube to show any problems in the urethra or bladder when the child urinates.
4. ***Nuclear scan***
   - Uses liquid that contains a small amount of radioactive material to see how well the kidneys work
5. ***Computed Tomography***
6. ***Magnetic Resonance Imaging***

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