CARE OF AT-RISK / HIGH-RISK / SICK SCHOOL-AGED CHILDREN

I. DIABETES MELLITUS (DM)

- A disorder in which blood sugar (glucose) levels are abnormally high because the body does not produce enough insulin or fails to respond normally to the insulin produced.
- Diabetes describes a group of conditions with high blood glucose levels (hyperglycemia) caused by decreased insulin production, decreased effect of insulin, or both.

TYPES

A. **Prediabetes**

- A condition in which blood glucose levels are too high to be considered normal but not high enough to be considered diabetes.
- More common among obese adolescents.

B. **Type 1 Diabetes**

- Occurs when the pancreas produces little or no insulin.
- Most common type among children, causing about two thirds of all cases of diabetes.
- Type 1 diabetes can develop at any time during childhood, even during infancy, but it usually begins between ages 4 years and 6 years or between ages 10 years and 14 years.

Sign and Symptoms

- Increased thirst
- Frequent urination
- Bed-wetting in children who previously didn't wet the bed during the night
- Extreme hunger
- Unintended weight loss
- Irritability and other mood changes
- Fatigue and weakness
- Blurred vision

Treatment

- To control blood glucose, children with type 1 diabetes take injections of insulin.
- Children with type 1 diabetes are given fluids (to treat dehydration) and insulin. They always require insulin because nothing else is effective.
- Children who do not have DKA at diagnosis typically receive two or more daily injections of insulin.

There are several types of insulin regimens:

Basal–bolus insulin regimen

- Involves taking one or two injections of longer-acting insulin (basal dose) every day and then separate supplemental injections (bolus dose) of a short-acting insulin immediately before meals

Multiple daily injections (MDI) regimen

- Can be used if the basal–bolus regimen is not an option. In this regimen, children usually receive a form of insulin works quickly before eating breakfast and dinner and at bedtime.

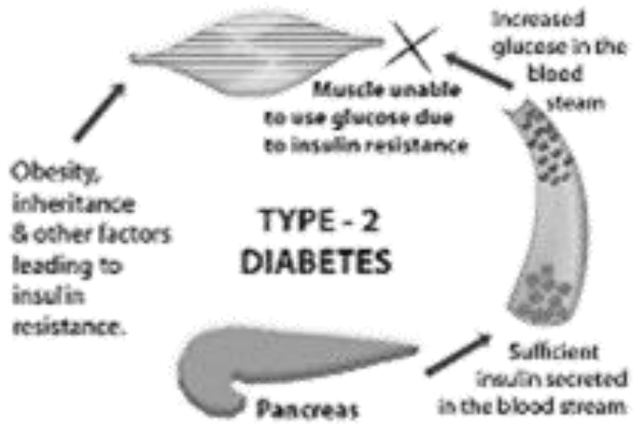
Premixed insulin regimens

- Use a fixed mixture of two forms of insulin: one that works quickly and lasts for only a few hours, and one that takes longer to work but lasts longer.

– Insulin can be injected in several ways:
  - Vial and syringe
  - Insulin pen
  - Insulin pump

C. **Type 2 Diabetes**

- A problem with the body that causes blood glucose (sugar) levels to rise higher than normal.
- This is also called hyperglycemia. Type 2 diabetes is the most common form of diabetes.



Treatment

Children with type 2 diabetes usually are not treated in the hospital unless the diabetes is severe.

– ***Metformin*** is the main drug given orally for children and adolescents. It is started at a low dose and often increased over several weeks to higher doses. It can be taken with food to prevent nausea and abdominal pain.

– **Insulin** is given to children who are hospitalized with severe diabetes. It can often be stopped after several weeks once glucose levels return to normal after treatment with metformin. Children whose type 2 diabetes is not controlled by metformin alone need to take insulin. About half of adolescents with type 2 diabetes ultimately require insulin.

A few children who lose weight, improve their diet, and exercise regularly may be able to stop taking the drugs.

II. RHEUMATIC FEVER

- An inflammatory disease that can develop as a complication of inadequately treated strep throat or scarlet fever.
- Most common in 5- to 15-year-old children, though it can develop in younger children and adults.
- Can cause permanent damage to the heart, including damaged heart valves and heart failure.

Signs and Symptoms

– The onset of rheumatic fever usually occurs about two to four weeks after a strep throat infection.

– Signs and symptoms – which result from inflammation in the heart, joints, skin or CNS – include:
  - Fever
  - Painful, swollen and tender joints — most often in the knees, ankles, elbows and wrists
  - Pain in one joint that migrates to another joint
  - Small, painless bumps (nodules) beneath the skin
  - Chest pain
  - Heart murmur
  - Fatigue
  - Flat or slightly raised, painless rash with a ragged edge (erythema marginatum)
  - Jerky, uncontrollable body movements – most often in the hands, feet and face, accompanied by
  - Outbursts of unusual behavior, such as crying or inappropriate laughing, that

Risk factors

- ***Family history***
- ***Type of strep bacteria***
- ***Environmental factors*.** Overcrowding, poor sanitation and other conditions that can easily result in the rapid transmission or multiple exposures to strep bacteria.

Diagnosis

- Blood tests
- Electrocardiogram (ECG)
- Echocardiogram

Treatment

- ***Antibiotics*.** Penicillin or another antibiotic to eliminate remaining strep bacteria.
- ***Anti-inflammatory*.** Aspirin or naproxen, to reduce inflammation, fever and pain.
- ***Anticonvulsant*.** Valproic acid/or Carbamazepine for severe involuntary movements.

III. RHEUMATIC ARTHRITIS / JUVENILE IDIOPATHIC ARTHRITIS

- Formerly known as **Juvenile Rheumatoid Arthritis**, is the most common type of arthritis in children under the age of 16.

Symptoms

- ***Pain*.** Limps – especially first thing in the morning or after a nap.
- ***Swelling*.** Common but is often first noticed in larger joints such as the knee.
- ***Stiffness*.** Child appears clumsier than usual, particularly in the morning or after naps.
- ***Fever, swollen lymph nodes and rash*.** Rash on the trunk may occur – which is usually worse in the evenings.

Diagnosis

- ***Blood tests***
  - ***Erythrocyte Sedimentation Rate (ESR)***. The sedimentation rate is the speed at which the RBCs settle to the bottom of the tube of blood.
  - ***Anti-nuclear antibody***. Proteins commonly produced by the immune systems of people with certain autoimmune diseases, including arthritis.
  - ***Rheumatoid factor***. This antibody is occasionally found in the blood of children with Juvenile Idiopathic Arthritis.
  - ***Cyclic Citrullinated Peptide (CCP)***. Like the rheumatoid factor, CCP is another antibody that may be found in the blood of children with Juvenile Idiopathic Arthritis.
- ***Imaging scans***
  - ***X-rays*** or ***Magnetic Resonance Imaging (MRI)*** may be taken to exclude other conditions, such as fractures, tumors, infection or congenital defects.

Complications

- ***Eye problems*.** Some forms can cause eye inflammation (uveitis). If this condition is left untreated, it may result in cataracts, glaucoma and even blindness.
- **Growth problems.** Some medications used for treatment, mainly corticosteroids, also can inhibit growth.

Treatment

- ***Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)*.** These medications, such as Ibuprofen and Naproxen Sodium, reduce pain and swelling. Side effects include stomach upset and liver problems.

– ***Disease-Modifying Antirheumatic Drugs (DMARDs).*** Used when NSAIDs alone fail to relieve symptoms of joint pain and swelling or if there is a high risk of damage in the future.

IV. SCABIES

- Also known as the **Seven-Year Itch**, is a contagious skin infestation by a tiny burrowing mite called **Sarcoptes Scabiei**.
- It is contagious and can spread quickly through close physical contact in a family, child care group, school class, nursing home or prison.

Signs and symptoms

Symptoms typically appear 2-6 weeks after infestation for individuals never before exposed to scabies.

– ***Itching***, often severe and usually worse at night

– ***Rash / Thin, irregular burrow tracks*** made up of tiny blisters or bumps, typically appear in folds of the skin. Though may appear in almost any part of the body, it is most often found:
  - Finger webs
  - Soles of the feet
  - Ventral wrists
  - Inner elbows
  - Back
  - Buttocks
  - External genitals
  - In the armpits
  - Around the male genital area

  In infants and young children, common sites of infestation usually include the:
  - Skin of the face
  - Scalp
  - ***Acropustulosis***, or blisters and pustules on the palms and soles of the feet, are characteristic symptoms of scabies in infants.

Cause

Scabies Mite. The burrows are created by excavation of the adult mite in the epidermis.

Transmission. Scabies is contagious and can be contracted through prolonged physical contact with an infested person. This includes:
- ***Sexual intercourse,*** though majority of cases are acquired through other forms of skin-to-skin contact.
- Less commonly, scabies infestation can happen through the sharing of clothes, towels, and bedding, but this is not a major mode of transmission; individual mites can survive for only 2-3 days, at most, away from human skin at room temperature.
- As with lice, latex condom is ineffective against scabies transmission during intercourse, because mites typically migrate from one individual to the next at sites other than the sex organs.

Prevention

– No vaccine is available for scabies.

– Simultaneous treatment of all close contacts is recommended, even if they are asymptomatic, to reduce rates of recurrence.

– Since mites can survive for only 2-3 days without a host, other objects in the environment pose little risk of transmission except in the case of ***Crusted Scabies***.
  - Also called ***Norwegian scabies***. Elderly, disabled, and immunosuppressed people such as those with HIV and cancer, or those on immunosuppressive medications, are susceptible to crusted scabies.

Management

– Treatment should involve the entire household, and any others who have had recent, prolonged contact with the infested individual.

– Options to control itchiness include antihistamine and prescription anti-inflammatory agents.

– Bedding, clothing and towels used during the previous three days should be washed in hot water and dried in a hot dryer.

– A number of medications are effective in treating scabies:

1. ***Permethrin*** a ***Pyrethroid Insecticide***
   - Most effective treatment for scabies, and remains the treatment of choice.
   - It is applied from the neck down, usually before bedtime, and left on for about eight to 14 hours, then washed off in the morning.
   - Care should be taken to coat the entire skin surface, not just symptomatic areas; any patch of skin left untreated can provide a "safe haven" for one or more mites to survive.
2. Oral ***Ivermectin***
   - Effective in eradicating scabies, often in a single dose.
   - It is the treatment of choice for crusted scabies, and is sometimes prescribed in combination with a topical agent.
   - It has not been tested on infants, and is not recommended for children under six years of age.
3. Topical ***Ivermectin***
   - Shown to be effective for scabies in adults.
   - It has also been useful for sarcoptic mange (the veterinary analog of human scabies) conditions.

– Other treatments include:
1. ***Lindane*** is effective, but concerns over potential neurotoxicity have limited its availability in many countries.
2. ***Sulfur ointments*** or ***Benzyl Benzoate*** are often used in developing world due to their low costs.
3. ***Crotamiton*** or ***sulfur preparations*** are sometimes recommended instead of ***Permethrin*** for children, due to concerns over dermal absorption.

V. PEDICULOSIS

- An infestation of lice (blood-feeding ectoparasitic insects).
- The condition can occur in almost any species of warm-blooded animals including humans.
- The crawling stages of this insect feed on human blood, which can result in severe itching.

TYPES

PEDICULOSIS HUMANUS CORPORIS
– Caused by body louse which infests humans and is adapted to lay eggs in clothing, rather than at the base of hair, and is thus of recent evolutionary origin.
– Pediculosis is a more serious threat due to possible contagion of diseases such as typhus.

PEDICULOSIS PUBIS
– The **pubic** or **crab louse** crab (*Pthirus pubis*) is a parasitic insect which spends its entire life on human hair and feeds exclusively on blood.
– Humans are the only known host of this parasite.

PEDICULOSIS CAPITIS
– The **head louse** (*Pediculus humanus capitis*) is an obligate ectoparasite of humans that causes head lice infestation.

– Head-lice infestation is most frequent on children aged 3–12 and their families.

– Head lice are spread through direct head-to-head contact with an infested person. From each egg or "nit" may hatch one nymph that will grow and develop to the adult louse. Lice feed on blood once or more often each day by piercing the skin with their tiny needle-like mouthparts.

– Lice cannot burrow into the skin.

Signs and Symptoms

- ***Itching*** on the scalp, neck and ears is the most common symptom. While feeding, lice excrete saliva which irritates the skin and causes itching. When a person has an infestation for the first time, itching may not occur for two to six weeks after infestation.
- ***Lice on scalp*** may be visible but are difficult to spot because they are small, avoid light and move quickly.
- ***Lice eggs (nits) on hair shafts*.** Incubating nits may be difficult to see because they are very tiny.

Factors Affecting Infestation

- Number of children per family
- Sharing of beds and closets
- Hair washing habits
- Local customs and social contacts
- Healthcare in a particular area (e.g. school)
- Socioeconomic status
- Girls are 2-4 times more frequently infested than boys.

Transmission

- Lice have no wings or powerful legs for jumping, so they move using their claw-like legs to transfer from hair to hair.
- Head-to-head contact is by far the most common route of lice transmission.

Treatment

- There is no product or method which assures 100% destruction of the eggs and hatched lice after a single treatment.
- However, there are a number of treatment methods that can be employed with varying degrees of success. These methods include:
  - Chemical treatment
  - Combs
  - Shaving
  - Hot air
  - Silicone-based lotions
  - Ethanol (ethyl alcohol).
- Pediculosis is commonly treated with Permethrin lotion.

VI. IMPETIGO

- A bacterial infection that involves the superficial skin
- The most common presentation is yellowish crusts on the face, arms, or legs.
- Less commonly there may be large blisters which affect the groin or armpits.

Signs and Symptoms

1. ***Contagious Impetigo***
   - This most common form of impetigo, also called ***Nonbullous Impetigo***, most often begins as a red sore near the nose or mouth which soon breaks, leaking pus or fluid, and forms a honey-colored scab followed by a red mark which heals without leaving a scar.
   - Sores are not painful, but they may be itchy.
   - Lymph nodes in the affected area may be swollen, but fever is rare.
   - Touching or scratching the sores may easily spread the infection to other parts of the body.
2. ***Bullous Impetigo***
   - Mainly seen in children younger than 2 years, involves painless, fluid-filled blister mostly on the arms, legs, and trunk, surrounded by red and itchy (but not sore) skin.
   - The blisters may be large or small. After they break, they form yellow scabs.
3. ***Ecthyma***

- Nonbullous form of impetigo, produces painful fluid or pus-filled sores with redness of skin, usually on the arms and legs, become ulcers that penetrate deeper into the dermis.
- After they break open, they form hard, thick, gray-yellow scabs, which sometimes leave scar.
- Ecthyma may be accompanied by swollen lymph nodes in the affected area

Cause

– Primarily caused by ***Staphylococcus Aureus***, and sometimes by ***Streptococcus Pyogenes***.
– Both bullous and nonbullous are primarily caused by *S. Aureus.*
– *Streptococcus* is commonly being involved in the nonbullous form.

Predisposing Factors

– Children ages 2–5, especially those that attend school or day care. 70% of cases are the nonbullous form and 30% are the bullous form.
– Other factors can increase the risk of contracting impetigo such as:
  - Diabetes mellitus
  - Dermatitis
  - Immunodeficiency disorders
  - Other irritable skin disorders.
– Impetigo occurs more frequently among people who live in warm climates.

Transmission

– Direct contact with lesions or with nasal carriers.
– The incubation period is 1–3 days after exposure to *Streptococcus* and 4–10 days for *Staphylococcus.*

Prevention

– Skin and any open wounds should be kept clean and covered. Care should be taken to keep fluids from an infected person away from the skin of a non-infected person.
– Washing hands, linens, and affected areas
– Avoid scratching
– Eliminate sharing of clothing or linens.

Children with impetigo can return to school 24 hours after starting antibiotic therapy as long as their draining lesions are covered.

Treatment

– ***Antibiotics***, cream or by mouth, are usually prescribed.
– Mild cases may be treated with ***Mupirucin*** ointments.
– In 95% of cases, a single 7-day antibiotic course results in resolution in children.
– More severe cases require oral antibiotics, such as ***Dicloxacillin***, ***FLucloxacillin*** or ***Erythromycin***.
– Alternatively, ***Amoxycillin*** combined with ***Clavulanate Potassium***, ***Cephalosporins*** (first-generation).
– Alternatives for people who are seriously allergic to penicillin or infections with ***Methicillin***-resistant ***Staphococcus Aureus*** include ***Doxycycline***, and ***Trimethoprim Sulphamethoxazole***, although ***Doxycycline*** should not be used in children under eight years old due to the risk of drug-induced tooth discoloration.
– When ***Streptococci*** alone are the cause, ***Penicillin*** is the drug of choice.
– When the condition presents with ulcer, Valacyclovir, an antiviral, may be given in case a viral infection is causing the ulcer.

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