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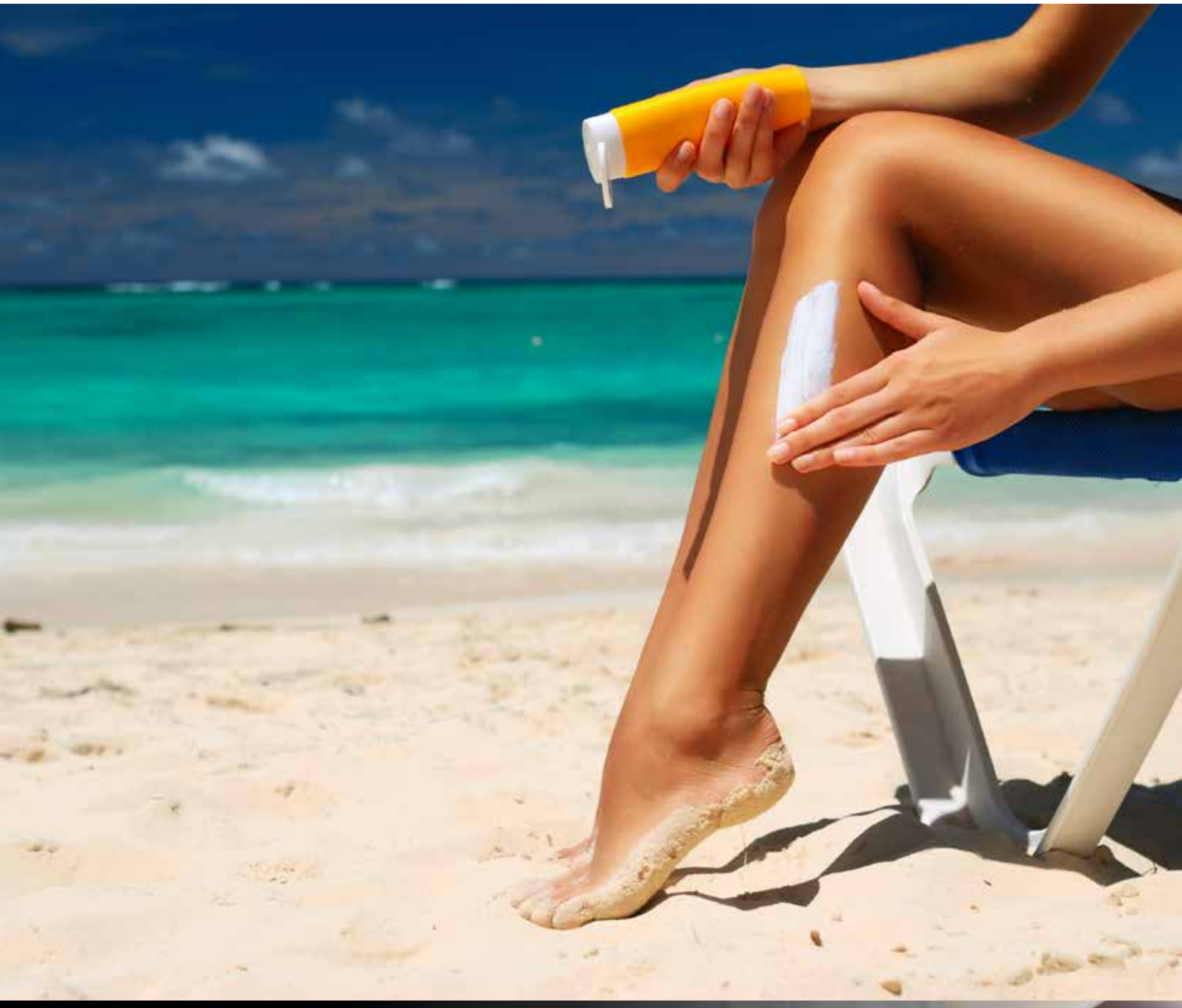

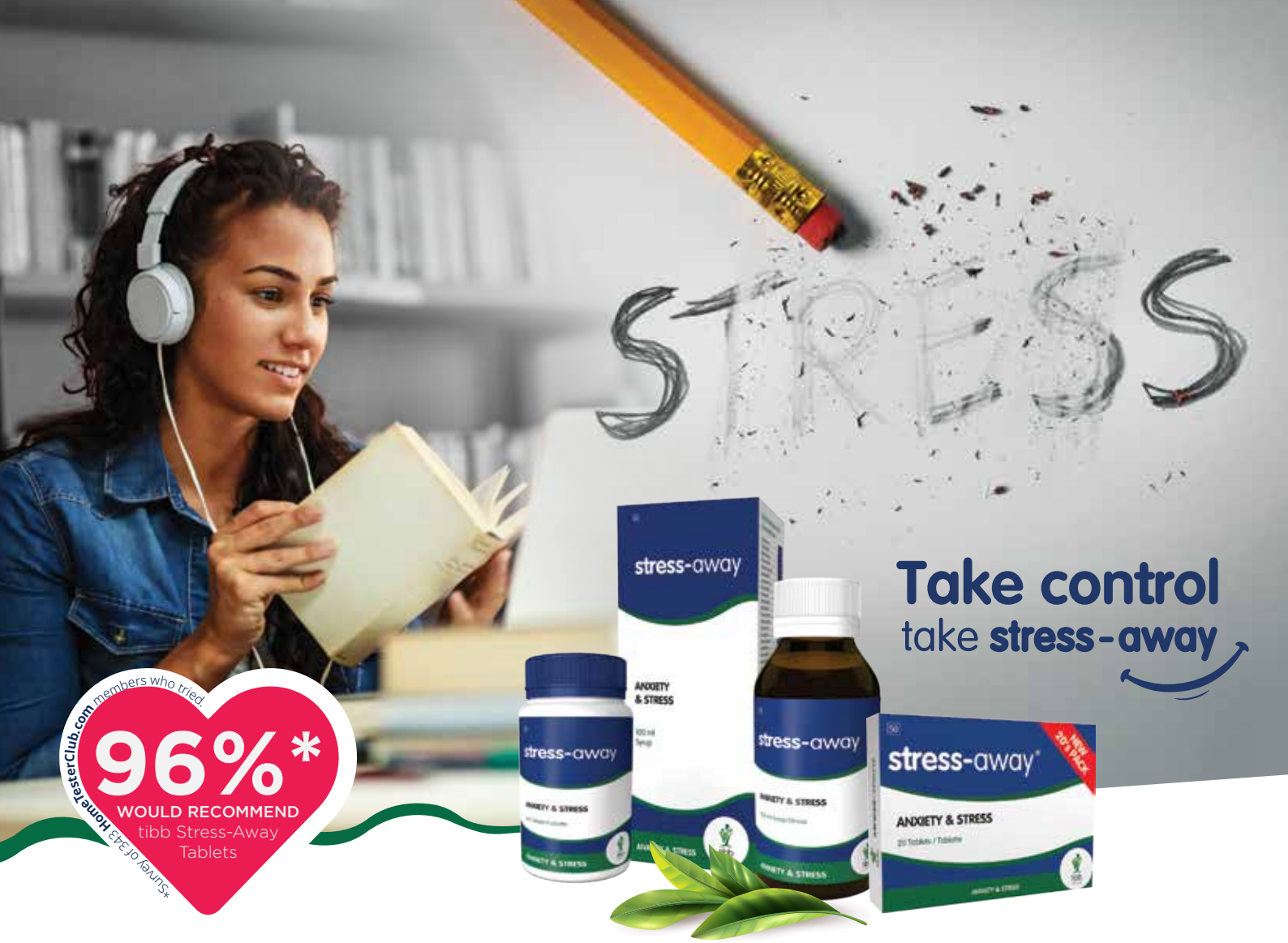

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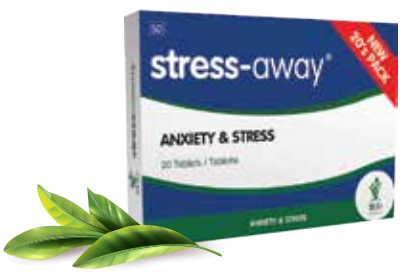

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Empowering pharmacist's assistants in South Africa: your critical role in antimicrobial resistance

Natalie Schellack

Globally antimicrobial resistance (AMR) has reached a critical point. In September 2024, world leaders gathered at the United Nations General Assembly to set new targets for combating this growing threat.[1] As a pharmacist's assistant in South Africa, you play a vital role in this battle, and it's crucial to understand the challenges we face and the impact you can have.

AMR occurs when bacteria, viruses, fungi, and parasites no longer respond to the medicines designed to treat them. This leaves patients vulnerable to infections that were once easily treatable. In the African region, including South Africa, AMR is responsible for over 255 000 deaths annually, with seven leading pathogens causing more than 821 000 deaths associated with resistance.[2]

South Africa faces unique challenges in implementing antimicrobial stewardship programs. A recent review of these initiatives in South African hospitals showed ongoing efforts across public and private sectors, but also highlighted the need for better alignment with the National Antimicrobial Resistance Strategy and improved collaboration between sectors.[3] The COVID-19 pandemic exposed vulnerabilities in infection prevention and control (IPC) practices, with a significant increase in hospital-acquired infections during the third wave compared to the first. This underscores the urgent need to address shortages in infrastructure, resources, and trained IPC practitioners.[4]

As a pharmacist's assistant, you are at the forefront of healthcare delivery in South Africa. With over 22 000 pharmacist's assistants working across nearly 5 000 pharmacies nationwide, you have a unique opportunity to influence public understanding and behaviour regarding antibiotic use. Your role is particularly crucial in underserved areas, where patients often seek treatment directly from community pharmacies. You can contribute significantly to ensuring appropriate use of antimicrobials and providing responsible access to antibiotics. The World Health Organization's AWaRe (Access, Watch, Reserve) classification of antibiotics is a valuable tool in this effort.[5]

Despite your potential to make a positive impact, there are challenges to overcome. A recent study in South Africa observed self-purchasing of antibiotics in independent pharmacies, highlighting the need for improved stewardship. The study also revealed misconceptions about antibiotic use among patients, with many believing antibiotics could treat colds and coughs.[6] Language barriers and cultural context also play a role in understanding AMR. For example, the term "AMR" doesn't have a direct translation in some native South African languages, making it difficult for patients to grasp the concept. This emphasises the importance of contextualising education and using appropriate terminology when communicating with patients.[6]

Vaccines are a powerful tool in mitigating AMR by preventing infections and reducing antibiotic use. South Africa has recently made changes to its childhood immunisation programme, transitioning from the 13-valent pneumococcal conjugate vaccine to the 10-valent version. This change has allowed for the introduction of additional vaccines, including a rubella-containing vaccine and booster doses of acellular pertussis vaccines for adolescents and pregnant women.[7]

As a pharmacist's assistant, you can play a crucial role in promoting vaccination. The South African Pharmacy Council (SAPC) has published accreditation criteria for Immunisation and Injection Techniques courses, paving the way for pharmacists to become qualified vaccinators.[8] While this primarily affects pharmacists, it opens up opportunities for pharmacist's assistants to support vaccination efforts and educate patients about the importance of immunisation in combating AMR.

To effectively combat AMR and meet the goals set by global leaders, a comprehensive approach is needed. This could look like engaging with communities to address cultural barriers to vaccination and appropriate antibiotic use. Integrating health literacy education into school curricula, utilising diverse communication channels to reach different demographic groups. Addressing systemic issues that impact health literacy and medication adherence. Collaborating with other healthcare professionals to ensure consistent messaging.

You are a crucial link between healthcare systems and the community. Your role in educating patients, promoting responsible

antibiotic use, and supporting vaccination efforts is invaluable. By staying informed and actively engaging in antimicrobial stewardship, you can make a significant difference in public health outcomes in South Africa.

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Artificial tears for the management of dry eye Focus on **Xailin®** range

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Abstract

Dry eye is a common condition that can significantly impact daily life. It is characterised by a loss of homeostasis in tear film. Disruption in the tear film whether it is due to a decrease in tear production and/or an increase in tear evaporation can result in discomfort, irritation, and potential damage to the ocular surface. Among the treatment options available, artificial tears are the most used and form an effective part of the management plan.

Introduction

Dry eye disease (DED) is a common ocular condition affecting millions of people globally.[1] There are many causes for dry eye and older age has been identified as one of the major risk factors. DED is also more common in women than in men.[2-4]

DED has a significant impact on the patient's quality of life due to symptoms such as ocular discomfort and visual disturbances.[2,5] It is also known as dry eye syndrome, dysfunctional tear syndrome and keratoconjunctivitis sicca.[3]

The role of the tear film

The tear film consists of lipid (outermost layer), aqueous and mucin layers. The latter two layers are also collectively known as the muco-aqueous layer.[6,7] Although each layer has its own function, they work together as a unit, to keep the ocular surface clear, smooth, hydrated and lubricated.[4,7] The tear film also supplies nutrients to the cornea and protects the ocular surface by washing away foreign materials, external bacteria and microorganisms.[1,6,7]

Disruption to any of these layers can lead to dry eye, ocular irritation, visual disturbances and possible damage to the ocular surface.[2-4,7] Based on the underlying cause, DED can be classified into aqueous deficient or evaporative DED (Table I).[2,3,6] However, it is thought that in up to 30% of patients, both these forms coexist.[3,5]

Environmental factors such as wind, air drafts (e.g. air-conditioners and fans), low humidity, pollution and dust can contribute to or even cause DED symptoms.[2,3]

Signs and symptoms of DED

In most cases, DED does not cause permanent vision loss.[2] Symptoms may vary in severity and duration. In addition, vision may fluctuate during the day and symptoms tend to be worse later in the day.[2] DED may also become more chronic, and some patients may find that their symptoms gradually get worse over time and/or they may experience a fluctuation in the severity of symptoms.[2]

Symptoms include:[2,3,6]

- Dryness
- General eye irritation
- Itching
- Redness
- Burning sensation
- Intermittent blurred vision
- Light sensitivity
- Foreign body sensation/gritty sensation
- Paradoxical excessive tearing
- Contact lens intolerance (difficulty wearing contact lenses)

The role of artificial tears

Among the treatments available, artificial tears are widely used, well tolerated and effective for treating dry eye.[2] Artificial tears are the first-line and mainstay treatment for dry eye.[6]

Table I: Classification and causes of DED[2-4,6,7]

DED	Notes	Causes include, but are not limited to
Aqueous deficient DED	This is when the eyes do not produce enough tears. The aqueous layer in the tear film is mainly produced by the lacrimal glands. Inflammation, dysfunction or blockage of the lacrimal gland can lead to a deficiency of aqueous tears.	Sjögren's disease Non-Sjögren's dry eye • Ageing • Systemic medications that decrease tear production such as antihistamines, antidepressants, diuretics and systemic retinoids (e.g. isotretinoin) • Contact lens use • Diabetes mellitus
Evaporative DED	In this case, tears evaporate too quickly. The lipid layer is produced by meibomian glands which are situated at the edge of the eyelids. Abnormalities of the lipid layer are linked to an increase in tear film evaporation.	• Meibomian gland dysfunction (one of the most common causes) • Vitamin A deficiency • Eyelid disorders (eyelids turned outwards or inwards) • Decreased blink function or decreased blinking due to excessive use of digital screens • Ocular surface irritation due to eye allergies, preservatives in eye drops, chronic contact lens wear

There is an array of artificial tear products available over-the-counter (OTC) and it can sometimes be quite challenging to select the most suitable product for patients with DED. When selecting a product, it may be helpful to consider the following:[1,6]

- Artificial tear drops are typically applied four times a day but may be used more often if needed. Most people will notice an improvement within a few days after they start using artificial tear drops. However, it may take a few weeks to notice a significant improvement in symptoms. In some cases, patients may need to try a different product.[3]
- Lipid-containing artificial tear drops are thought to be effective in preventing tear evaporation by restoring the lipid layer of the tear film. They are often used for the management of evaporative dry eye conditions.[6]
- Gels and ointments may be considered for patients who do not respond adequately to artificial tear drops.[3] The benefit of using gel-like formulations is that the residence time on the ocular surface is increased (due to increased viscosity). The disadvantage, however, is that these formulations can lead to the formation of eyelid debris and cause transient blurring of vision. It is often best to use ointments at nighttime before going to sleep.[3,6]
- Preservatives in artificial tears
  - Patients who experience side effects from preservatives or who need to use artificial tears more than four times a day should preferably use a product that does not contain any preservatives.[2]
  - Some artificial tears are available as preservative-free single-dose units.[6]
  - Vanishing types of preservatives (for example, Purite® [oxychloro complex]) disappear upon contact with the eye (it turns into water, oxygen, sodium and chloride).[6] These preservatives have fewer side effects compared with traditional preservatives such as benzalkonium chloride.[5,6]
  - Multidose vials with microbial filters or membranes with antimicrobial properties are also emerging as alternatives to the use of preservatives.[6]
- Patients with moderate or severe pain, vision loss, as well as those who do not respond adequately to OTC treatment should be referred to the doctor.[2]

From a practical point of view

When starting treatment, it is important to address potentially modifiable risk factors such as:[2,3,6]

- Contact lens use
- Smoking
- The use of medications that could contribute to and/or aggravate symptoms of dry eyes
- Frequent use (more than four times per day) of preservative-containing eye medications
- Contributing conditions such as meibomian gland dysfunction (posterior blepharitis)
- Nutritional deficiencies, for example, Vitamin A deficiency

Other steps patients can take to help improve symptoms include:[2,3]

- Blinking often,[3] especially when using digital screens or when reading
- Avoiding or limiting exposure to allergens, dust, cigarette smoke and second-hand smoke
- Minimising exposure to heating, air drafts (e.g. use of ceiling fans), or air conditioning
- Using humidifiers to add moisture into the air

Focus on Xailin® product range

Table II summarises Xailin® treatment options for DED[8-13]

Conclusion

DED has a significant impact on the patient's quality of life. The aim of treatment is to ease discomfort, reduce signs and symptoms, and to maintain eye health. Effective management includes the use of artificial tears, changes in environmental or lifestyle factors and reducing modifiable risk factors.

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Table II: Xailin product range

Product	Use	Instructions for use	Preservative	Information for contact lens wearers	Notes
Xailin® Fresh[8,9]	Lubricating eye drop[8]	1–2 drops in each eye, 2–4 times per day single dose units; discard the vial after single use[8]	Preservative-free[8]	Contact lens friendly[8]	Carmellose sodium (carboxymethylcellulose [CMC]) is a lubricating agent that relieves discomfort, grittiness and other symptoms associated with dry eyes[8]
Xailin® Hydrate[10]	Long-lasting relief for mild, occasional or temporary forms of ocular discomfort and irritation associated with dry eyes, tiredness and environmental factors such as wind, salt water, smoke or computer work[10]	1–2 drops into each eye up to 4 times per day[10]	Preservative disappears upon contact with the eye[10]	Contact lens friendly	Hypromellose helps to moisten and lubricate the ocular surface[1,6] If other eye medication is used, wait at least 5–10 minutes between applications of other eye medicine and Xailin® Hydrate[10]
Xailin® PLUS 0,2% HA[11]	Moisturises and alleviates symptoms associated with dry eye syndrome and irritation, redness and eye fatigue caused by prolonged screen use, exposure to environmental factors such as wind, sun, dry air, salty water, smoke, dust, air conditioning and heating[11] Prevents symptoms of eye irritation caused by contact lens use[11]	1 drop 3–4 times a day in each eye or as often as needed[11]	Preservative-free[11]	Contact lens friendly[11]	Due to hyaluronic acid's (HA) viscoelastic properties and ability to adhere to the cornea, improves tear film stability and restores comfort of vision[11] HA can bind water multiple times its own weight;[1] this creates a reservoir of moisture on the surface of the eyes[1,6] If other eye medication is used, instil other medication first and wait at least 15 minutes before instilling Xailin® Plus eye drops[11]
Xailin® lubricating eye gel[12]	Lubricating eye drop Alleviates symptoms of dryness, discomfort, grittiness and minor irritations caused by dry eye[12]	1 drop 3–4 times daily or as required Blink 2 to 3 times to spread the gel Wipe away any excess gel from around the eyelids[12]	Contains cetrimide[9]	Can be used by contact lens wearers, but lenses should be removed prior to use and reinserted at least 30 minutes after instillation of gel[12]	Carbomer has excellent mucoadhesive properties and lubricates the eye by evenly coating the corneal and conjunctival surfaces[12] If other eye medicines are used, instil other product first, wait at least 5 minutes before applying carbomer gel[12] Blurred vision, sticky eyelids and transient burning sensation may occur after instillation[12]
Xailin® night lubricating eye ointment[13]	Soft ointment, that spreads easily and provides lubrication to the eye surface[13] It improves the tear film and relieves the sensations of burning, soreness, irritation and dry eyes[13]	Apply a thin line of ointment to inside of eye(s)[13] at night Wipe excess ointment from the eyelids using a clean tissue[13]	Preservative free[13]	Do not use with contact lenses Remove contact lenses before application[13]	If other eye medicines are used, instil other product first, wait for 30 minutes before applying lubricating eye ointment[13] May cause blurred vision and/or transient burning feeling[13]

Notes:
To ensure the safe use of eye drops, gels or ointments it is important to remind patients to avoid:[8-13]
- Touching their eye(s) or any other surface with the tip of the bottle or tube.
- Sharing the product with others.
- Driving or operating machinery if they experience temporary blurring following the use of eye drops or eye ointments. They should wait until normal vision is restored.

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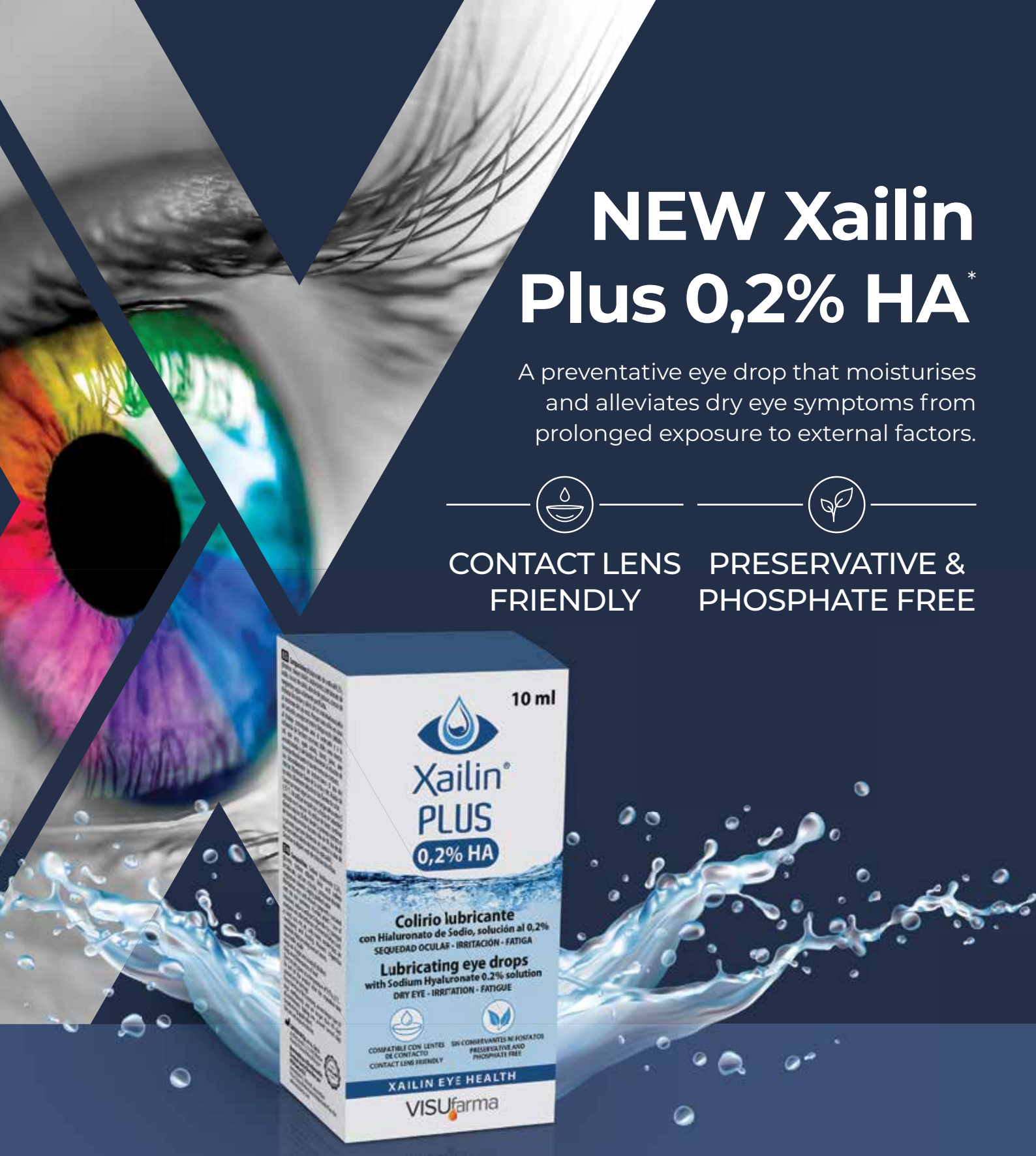

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Summer colds

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Abstract

A summer cold, or the common cold occurring during the warm summer months, is a viral infection of the upper airway causing symptoms such as a runny nose, nasal congestion and sore or scratchy throat.[1-4] More than 200 viruses are said to cause the common cold.[1,3] While there is no specific treatment for a cold, rest, adequate hydration and the use of over-the-counter (OTC) medications can help relieve symptoms.[4,5] Practising good hygiene is considered the best preventative measure against the common cold.[2,4] This article focuses on the symptoms, treatment and ways to prevent a summer cold.

Introduction

A summer cold is simply a common cold that one catches during the summertime.[1] Common colds are among the most common illnesses caused by many different viruses including rhinoviruses, adenoviruses, coronaviruses, and enteroviruses. Colds spread mainly when there is contact with these viruses via nasal secretions from an infected person. When people exposed to the viruses then touch their mouth, nose, or eyes, the viruses gain entry to the body and cause a cold. Less often, colds are spread when people breathe air containing droplets that were coughed or sneezed out by an infected person. A cold is most contagious during the first one or two days after symptoms develop.[2]

Symptoms

Cold-causing viruses affect the upper respiratory system and, in some cases, can also affect the digestive system.[3]

Respiratory symptoms of a summer cold include:[3]

- Cough
- Fever and body aches
- Headache
- Runny nose
- Sore throat

Digestive symptoms of a summer cold include:[3]

- Diarrhoea
- Nausea and vomiting
- Upset stomach

Symptoms of a cold start one to three days after infection, usually starting with a scratchy or sore throat or discomfort in the nose. This progresses to sneezing, runny nose, and feeling mildly ill. Fever is not common, but a mild fever may occur at the beginning of the cold.

At first, secretions from the nose are watery and clear and can be annoyingly plentiful, but eventually, they become thicker, opaque, yellow-green, and less plentiful. Many people also develop a mild cough. Symptoms usually disappear in four to ten days, although the cough often lasts into the second week.[2]

Treatment

There is no specific treatment for the viruses that cause the common cold. Most treatments are aimed at relieving some of the symptoms of the cold but do not shorten or cure the cold.[4] Currently available antiviral medications are not effective against colds. Antibiotics do not help people with colds, even when the nose or cough produces thick or coloured mucus. Taking an antibiotic when it is not needed can cause unnecessary side effects and contributes to the rise of antibiotic-resistant bacteria.[2]

Patients can alleviate some symptoms by ensuring they get sufficient rest and by taking in plenty of fluids to prevent dehydration and

Table I: Examples of OTC treatment options available to help alleviate symptoms of a cold[4-6]

Symptom	Type of treatment	Examples
Runny nose and sneezing	First-generation antihistamine tablets or syrups such as diphenhydramine, brompheniramine, chlorpheniramine or promethazine may be useful but can cause drowsiness. This may be helpful for patients who cannot sleep.	Allergex® Rhineton®
Blocked or stuffy nose	Decongestants such as pseudoephedrine, phenylpropanolamine or phenylephrine may be offered but should not be used in patients with uncontrolled high blood pressure or in pregnancy. They are combined with analgesics to relieve pain.	Demazin® Cold and Flu Nurofen® Cold and Flu Sinugesic®
	Normal saline nasal sprays can reduce runny nose and congestion. Saline nasal products can also be used to clean nasal passages before medicated products are applied. This may enhance the efficacy of intranasal medicated products.	Otrivin Sea Water® Salex® Sterimar®
	Nasal sprays containing oxymetazoline or xylometazoline may be used (maximum 2–3 consecutive days to prevent the risk of rebound congestion).	Dristan® Iliadin® Otrivin® Sinutab®
	Tablets containing decongestants are often available in combination with antihistamines*	Actifed® Cold Coryx® Demazin® Dimetapp® Rinex®
Thick mucus	Carbocysteine, n-acetylcysteine, and bromhexine break down thick mucus. These mucolytics make it easier to remove mucus from the airways.	ACC® 200/600 Betaphlem® Pholtex® Mucus 200 Mucatak® Mucospect® Solmucol®
Sore throat and headache	Paracetamol, ibuprofen, or naproxen	Advil® Aleve® Nurofen® Panado®
Cough	Dextromethorphan and codeine can suppress cough but should only be used when a patient has a dry cough that keeps them awake.	Benylin® Dry Cough Dilinct® Dry Cough
	Guaifenesin increases the production of a watery mucus and may be helpful in getting rid of mucus in patients with a wet cough. They should preferably not be used at the same time as antihistamines which work by drying up the mucus.	In Benylin® Bronchospect

* Products may also include other ingredients such as analgesics and/or vitamin C.

keep mucus thin. Consuming warm liquids may promote nasal drainage and make breathing easier. Tea with lemon and honey or other hot drinks may also help relieve congestion and ease a sore throat, and although there is no scientific evidence to support this, it is not harmful. Gargling with water or salt water may also be helpful to relieve a sore throat. Patients should avoid taking alcohol and caffeine as these can contribute to dehydration.[4,5]

Treatment will depend on what symptoms the patient is experiencing. Table I provides some medicines that are available OTC to help relieve symptoms.[5] It is important to always provide dosing instructions from the package insert provided by the relevant manufacturer.[4,5]

Cold and flu medications frequently contain combinations of active ingredients. Therefore, it is important to ensure that patients do not overdose by using more than one product that may contain the same or similar active ingredients. Always check with the patient to see what other medications they are using before recommending further treatment.[5]

Prevention

Hand washing is an essential and highly effective way to prevent the spread of most infections, including the common cold. Hands should be wet with water and plain soap, and rubbed together for at least 20 seconds. Special attention should be paid to the fingernails, between the fingers, and the wrists. Hands should be rinsed thoroughly and dried with a single-use towel.[4]

Alcohol-based hand rubs (e.g. sanitising gels) are a good alternative for disinfecting hands. Products with at least 60% alcohol are most effective. Hand rubs should be spread over the entire surface of hands, fingers, and wrists until dry. These rubs can be used repeatedly without skin irritation or loss of effectiveness. Hand rubs are available as a liquid or as single-use wipes in small, portable packs that are easy to carry in a pocket or handbag. When a sink is available, visibly soiled hands should be washed with soap and water.[4]

Hands should be washed before preparing food and eating and after coughing, blowing the nose, or sneezing. While it is not always possible to limit contact with people who may be infected with a cold, touching the eyes, nose, or mouth after direct contact should be avoided when possible.[4]

In addition, tissues should be used to cover the mouth when sneezing or coughing, and used tissues should be disposed of promptly. Sneezing/coughing into the sleeve of one's clothing (at the inner elbow) does not contaminate the hands and is a good way of containing sprays of saliva and secretions. Wearing a face mask when sick is another way to reduce the chance of spreading viruses.[4]

Conclusion

While there is no cure for the common cold, rest, hydration, and OTC treatments can help ease symptoms, which can feel particularly uncomfortable during the warm summer months.[1,2,4] When recommending OTC treatments, it is important to first identify the patient's specific symptoms and consider any other medications they are taking to avoid overdosing or potential drug interactions.[4,5] Prevention is always better than cure, so advising patients to practise good hygiene should be a key part of the guidance for managing a summer cold.[2,4,5]

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Summer **sore throats**

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Abstract

Summer heat can put a strain on the body, particularly on the throat and respiratory system. As the temperatures rise so can the potential for dryness, dehydration, and uncomfortable symptoms such as coughing and a sore throat. Sore throats are characterised by painful, dry, or scratchy feelings in the throat and are divided into three types — pharyngitis, tonsillitis, and laryngitis — based on the part of the throat they affect. A sore throat caused by a virus will resolve with symptomatic treatment, but a bacterial infection may require antibiotics to prevent complications.

Introduction

Sore throats are often a sign of an upper respiratory tract infection, or URTI for short. These infections of the nose, nasal cavity, pharynx, larynx, and the subglottic region of the trachea, are the most prevalent infections encountered in community healthcare settings. Sore throats are a common manifestation of these infections. The majority of these infections are caused by viruses, not bacteria, affecting various components of the upper respiratory system to varying degrees. Typically, these infections resolve spontaneously without necessitating antibiotics.

Symptoms

A patient presenting in the pharmacy with a sore throat may complain that the throat is:

- painful, especially when swallowing or talking
- dry and scratchy
- red with white pustules around the back of the mouth

The patient may also be experiencing bad breath, a mild cough and swollen glands. Children frequently present with a high temperature and appear less active.[1]

Causes

Sore throats are usually caused by viruses (like the common cold or influenza viruses) and occasionally by bacteria. A sore throat could also be a symptom of scarlet fever or glandular fever.[1]

Other causes of a sore throat include:

- Allergies to dust and pollen, complicated by postnasal drip.
- Dryness.
- Irritants from air pollution, smoke, spices or chemicals.
- Muscle strain inflicted by talking loudly for long periods.
- Gastro-oesophageal reflux disease (GORD).
- Fungal infections such as oral thrush.
- Tumours of the throat, tongue or voice box (larynx).
- Rarely, an abscess in the throat or swelling of the epiglottis can cause a sore throat. *Both can block the airway, creating a medical emergency.*[2]

Treatment

To help soothe a sore throat and shorten its duration, patients can be advised to:[1,3]

- gargle with warm, salty water (one teaspoon of salt in 250 ml water)
- eat hydrating, cool or soft foods
- avoid smoking
- suck ice cubes
- drink plenty of water
- use a humidifier
- avoid alcoholic and caffeinated beverage
- drink herbal teas

Table: Products available in pharmacy to treat sore throat symptoms:

	Active ingredients	Rinse	Lozenge	Spray	Properties
Andolex®	Benzydamine HCl	√	√	√	Anti-inflammatory
Andolex-C®	Benzydamine HCl Chlorhexidine gluconate	√	√	√	Anti-inflammatory Antiseptic
Betadine®	Povidone-iodine	√			Antiseptic
Medi-keel®	Benzocaine Cetylpyridinium chloride		√		Local anaesthetic Antiseptic
Oralact®	Diclofenac	√		√	Anti-inflammatory
Orochlor®	Benzocaine Chlorhexidine gluconate			√	Local anaesthetic Antiseptic
Oranix®	Benzydamine HCl Chlorhexidine gluconate	√		√	Anti-inflammatory Antiseptic
Strepsil intensive®	Flurbiprofen		√	√	Anti-inflammatory
*Pharylex®	*Glycerol, honey, Glycocyanidin-A*			√	*Natural pain relief and healing*
*Viralguard®	*Elderberry, pelargonium and peppermint oil*			√	*Soothes sore, irritated throats and boosts immunity*

ANDOLEX™ is also available in throat lollies for children containing cetylpyridinium chloride which has antiseptic properties.

**These products are examples of complementary medicines available in the front shop.*

Over-the-counter oral medications that relieve throat pain include paracetamol, ibuprofen and aspirin. (Aspirin is contraindicated in children under 16 years of age, as it has been linked to a rare but serious condition called Reye's syndrome.)

Topically acting treatments which can be recommended for an adult with a sore throat are available in:

- throat sprays
- oral rinses or gargles
- throat lozenges[4]

These preparations are not recommended for use in children, as lozenges may present a choking hazard, and children are often unable to gargle. The nozzle on the throat sprays can also be potentially dangerous in children. There are a few medicated and herbal throat lolly products for children which offer a safer option for symptomatic treatment.

Symptomatic treatments for sore throat may contain, singularly or in combination:

- an antiseptic such as chlorhexidine gluconate, povidone-iodine or cetylpyridinium chloride
- an anti-inflammatory, for example diclofenac, flurbiprofen or benzydamine hydrochloride (HCl)
- a local anaesthetic such as benzocaine
- certain herbal ingredients which claim to have similar properties to the above.

When to refer

Adults should be referred to the doctor if a sore throat is severe; lasts longer than a week; if they have difficulty swallowing, breathing or opening the mouth; joint pain; earache; rash; high fever; or blood in saliva or phlegm. Frequently recurring sore throats, hoarseness lasting more than two weeks, a lump in the neck or swelling in the neck or face require swift medical attention.[2] A child must be referred to a doctor if the sore throat doesn't resolve within the first few days, if there are any breathing or swallowing concerns, or unusual drooling, which might indicate an inability to swallow.[2]

Conclusion

Viral and bacterial infections, as well as irritants and injuries, cause most sore throats. Rest, warm liquids, saltwater gargles, and over-the-counter pain relievers can help soothe the pain of a sore throat. A healthy throat can be maintained during the summer by keeping well-hydrated.[3]

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Managing **musculoskeletal pain** in the pharmacy

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Abstract

Musculoskeletal pain represents a significant global health burden affecting nearly half of the general population, with a substantial proportion suffering from persistent pain. This article explores the role of the pharmacist's assistant in managing musculoskeletal pain. It outlines the causes and symptoms of this type of pain, which may affect bones, joints, muscles, tendons, and ligaments. The focus of the article is on both non-pharmacological and pharmacological strategies for pain management, including immediate actions following injuries, lifestyle modifications, and the use of medications such as topical analgesics and oral anti-inflammatories. The role of the pharmacist's assistant in educating patients about pain management and when to seek further medical consultation is also highlighted, along with specific symptoms that require referral to a doctor.

Introduction

Musculoskeletal pain is the most common cause of disability globally.[1] It affects approximately 47% of the general population and, of those, about 39–45% have long-lasting pain that requires medical consultation.[2] The pharmacist's assistant can provide patient education, information on preventative strategies and non-pharmacological pain control techniques and can also advise on pharmacological treatment options to manage musculoskeletal pain.

Causes and symptoms of musculoskeletal pain

Musculoskeletal pain refers to pain affecting the muscles, bones, tendons, ligaments, and joints.[3] It can range from mild discomfort to severe, debilitating pain and can be either acute (short-term) or chronic (lasting longer than three to six months).[3,4] The most common types of musculoskeletal pain include:[3]

- Bone pain: injuries such as bone fractures or, less commonly, tumours[3]
- Joint pain: dislocations, osteoarthritis, rheumatoid arthritis, gout and bursitis (due to overuse)[5]
- Muscle pain: muscle cramps, spasms, strains and injuries as well as infections and tumours[3]
- Tendon and ligament pain: sprains, inflammation and overuse injuries[3]

The symptoms of musculoskeletal pain can vary depending on the cause but commonly include muscle aches, spasms or twitches, joint stiffness, cracking or popping sounds in joints, redness, bruising, swelling, and limited range of motion.[4,6] Patients may also experience sharp pain, dull aches, or a burning sensation, depending on the severity and type of injury or condition.[4,6]

Treatment of musculoskeletal pain

A combination of non-pharmacological and pharmacological interventions may be used to manage a patient's pain.[2]

Non-pharmacological management of pain

Immediate management of acute sprains and injuries involves application of an ice pack, compression, and elevation.[7] A simple elastic bandage should be fitted snugly (but not tightly) to the affected limb to reduce swelling. Elevation of the injured limb is recommended to reduce blood flow and swelling.[7]

The acronym PRICE is useful to remember recommendations for management of acute musculoskeletal injuries:[7]

P – Protect - using support such as taping, braces, crutches or other supports.[1,8]

R – Rest - for two to three days (or longer depending on severity) after an injury, after which mild exercise as recommended by a physiotherapist may be started.[7,8]

Table I: Some examples of treatment options for musculoskeletal pain[7,9,10,11]

Topical formulations		
	Active ingredient	**Examples**
Counterirritants and rubefacients	Methyl salicylate Capsaicin	*Deep Heat®, Solarub®, Pyngon®, Wintergreen® Capsicum® plasters, *Osteo Freeze Gel®
Anti-inflammatories	Diclofenac Ibuprofen Ketoprofen Piroxicam Benzydamine	Panamor® Gel, Voltaren® Gel Deep Relief® Gel Fastum® Gel Rheugesic® Gel Norflex® Gel
Oral formulations		
Anilides	Paracetamol	Calpol®, Napamol®, Panado®, Painamol®
Anti-inflammatories	Diclofenac Ibuprofen Naproxen	Cataflam®, Dicloflam®, K-Fenak®, Panamor®, Veltex®, Voltaren® Advil®, Betagesic®, Brufen®, Betaprofen®, Ibugesic®, Pedea® Aleve®, Nafasol®
Supplements	Glucosamine and chondroitin	*OsteoEze®
Muscle relaxants	Mephenesin Methocarbamol Orphenadrine	Spasmend® Robaxin® Norflex®

* Combination products

Always refer to the manufacturer's package insert for dosing and directions

I – Ice packs - applied for 15–20 min every two to three hours for the first 48 hours after injury.

C – Compression - using an elastic bandage that fits snugly over the affected area without causing pain or restriction of blood flow. Note that elastic bandages should be removed before going to bed.[7,8]

E – Elevation - elevate intermittently to a level above the heart for as much as possible to reduce swelling.[8]

Heat should not be applied immediately after an injury has occurred but can be useful two days later or for management of chronic conditions such as back pain.[7] A warm shower or soaking in a warm bath with Epsom salts may also provide relief.[3]

To reduce joint and lower back pain, some patients may need to lose weight and start low-impact aerobic exercises such as walking or swimming, as well as stretching exercises to help get back strength and function.[5,7] Educating patients on good posture, correct lifting techniques and the importance of using a good mattress can help prevent lower back pain.[7]

Pharmacological management of musculoskeletal pain

Application of topical analgesics, through the act of massaging, increases blood flow to the area and stimulates the nerves which result in a reduction in the sensation of pain.[7] The use of topical analgesics is useful when targeting specific areas[5] and also reduces the risk of side effects and drug interactions when compared with oral preparations.[2,7]

According to the World Health Organization (WHO), analgesics should be taken via the simplest route on a regular basis according to the type and intensity of the pain.[2] Paracetamol can be considered alone or in combination with nonsteroidal anti-inflammatory drugs (NSAIDs) as it is relatively effective in many pain conditions with high tolerability and minimal adverse effects.[2] Patients should not exceed the recommended doses of paracetamol per day and should be monitored to detect liver toxicity if they use paracetamol on a regular basis.[2,4]

NSAIDs should be considered for treatment of non-specific lower back pain and patients with osteoarthritis of the knee, hip and/or hand. Patients should start on the lowest effective dose for the shortest possible time and should be warned about gastrointestinal, cardiovascular and renal side effects.[2]

When to refer

Patients should be referred to a doctor if:[5,12]

- Pain interferes with daily activities
- Pain is accompanied by fever
- Pain prevents the patient from walking normally
- The patient experiences loss of bladder control
- Numbness or tingling is present (this may be a sign of nerve pain)

Conclusion

The pharmacist's assistant can play an important role in the initial management and treatment of musculoskeletal pain. The strategic use of both non-pharmacological and pharmacological treatment modalities helps in addressing the diverse needs of patients with musculoskeletal pain. Importantly, recognising the signs and symptoms that warrant further medical evaluation is critical in preventing complications and ensuring appropriate treatment. As frontline health professionals, pharmacist's assistants are essential in guiding patients through their pain management journey, making significant contributions to their overall health outcomes.

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Paediatric diarrhoea

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Abstract

Paediatric diarrhoea remains a significant concern in global child health, particularly in developing regions. The pharmacist's assistant can play an essential role in educating caregivers on the treatment and prevention of paediatric diarrhoea. This article provides an overview of the causes, symptoms, treatment, and prevention of diarrhoea in children, with a particular focus on dehydration management using oral rehydration solutions (ORS) and the role of zinc supplementation. Additionally, it discusses when referral to the doctor or clinic is necessary and the importance of hygiene, nutrition, and vaccines in reducing diarrhoea cases.

Introduction

Paediatric diarrhoea is one of the leading causes of illness and death in children under five years of age, particularly in low- to middle-income countries.[1,2] Globally, diarrhoea accounts for nearly 9% of all deaths in children. Many of these deaths are preventable with proper treatment and care.[1,3] The pharmacist's assistant is often the first point of contact for caregivers seeking advice and treatment for children suffering from diarrhoea, making their role in managing this condition critical. In addition to providing treatments, the pharmacist's assistant can offer guidance on prevention measures and recognise the signs that indicate the need for medical referral.

Definition and potential causes of paediatric diarrhoea

Acute diarrhoea is defined as the passage of three or more loose or liquid stools in a 24-hour period. In children, diarrhoea is most commonly caused by infections from viruses, bacteria, and parasites, though other factors such as food intolerances and antibiotics can contribute to the condition.

1. **Viral infections**: The most common viral cause of diarrhoea in children is rotavirus, which can lead to severe dehydration, especially in infants. Other viral agents that can cause diarrhoea include norovirus, adenovirus, and astrovirus. The widespread use of rotavirus vaccines has significantly reduced diarrhoea cases, but rotavirus diarrhoea remains a major concern in unvaccinated children.[4,5]

2. **Bacterial infections**: Diarrhoea can also be caused by bacterial infections, including *Escherichia coli* (*E. coli*), Shigella, Salmonella, and Campylobacter. These infections are usually associated with poor sanitation and contaminated food or water.[4,5]

3. **Parasitic infections**: In areas with inadequate sanitation, parasitic infections like *Giardia lamblia* and Cryptosporidiumis are important causes of diarrhoea.[1,5]

4. **Non-infectious causes**: Food intolerances (such as lactose intolerance) and the use of certain medications, particularly antibiotics, can disrupt the normal bacterial flora of the gut, leading to diarrhoea.[4,5]

Symptoms and signs of dehydration

The primary concern in paediatric diarrhoea is the risk of dehydration, which can develop rapidly in children due to their smaller body size and higher turnover of fluids. The pharmacist's assistant should be aware of the symptoms of dehydration, which include:

- Dry mouth and tongue
- Sunken eyes or cheeks
- Reduced skin elasticity (skin turgor)
- Decreased urine output or no urination for several hours
- Lethargy or irritability
- Thirst (in mild to moderate cases)[1,6]

In severe dehydration, symptoms can escalate to cold extremities, a rapid or weak pulse, and even unconsciousness. If any of these signs

are present, it is essential to refer the child to a healthcare provider immediately.[1,6]

Prevention and treatment of paediatric diarrhoea

The primary goal in treating paediatric diarrhoea is preventing and managing dehydration. While most diarrhoeal episodes are self-limiting and resolve within a few days, ensuring proper hydration is critical to preventing complications.[1,2,5]

1. **Oral rehydration solutions (ORS)**: ORS remains the cornerstone of diarrhoea treatment. It contains a precise balance of salts, sugars, and water that helps replace lost fluids and electrolytes. The pharmacist's assistant should encourage caregivers to use ORS as soon as diarrhoea begins, even if the child does not yet appear dehydrated. ORS sachets should be mixed with the correct amount of clean water (typically 200–250 mL per sachet) to ensure effectiveness.[1,5,7]

2. **Zinc supplementation**: Zinc has been shown to reduce the duration and severity of diarrhoeal episodes. The World Health Organization (WHO) recommends giving 10–20 mg of zinc daily for 10–14 days in children with diarrhoea. Zinc is an essential micronutrient that helps the immune system recover more quickly and reduces the risk of future diarrhoeal episodes.[8]

3. **Continued feeding**: Contrary to old practices of withholding food, children with diarrhoea should continue to be fed age-appropriate foods. Breastfed infants should continue breastfeeding, while older children should be given soft, easily digestible foods. Nutrition helps to maintain strength and prevent malnutrition, which can prolong recovery.[1,7]

4. **Rotavirus vaccination**: The introduction of rotavirus vaccines has led to a significant reduction in diarrhoea-related hospitalisations. Ensuring that children receive their rotavirus vaccines on schedule (at six weeks and 14 weeks) can prevent severe cases of viral diarrhoea.[1,10]

5. **Hand hygiene**: Handwashing with soap and water is one of the most effective ways to prevent the spread of infectious agents that cause diarrhoea. The pharmacist's assistant can remind caregivers to wash their hands, particularly after using the toilet, before handling food, and after changing diapers.[1,10]

6. **Safe water and sanitation**: Caregivers should be encouraged to use clean drinking water, and in areas where this is not readily available, boiling water or using water purification tablets is recommended. Proper disposal of waste and food hygiene also play crucial roles in preventing the transmission of diarrhoeal diseases.[1]

7. **Nutrition**: Promoting breastfeeding during the first six months of life and providing a balanced diet rich in essential vitamins and minerals help strengthen a child's immune system and reduce their susceptibility to infections, including diarrhoea.[1]

8. **Medications**: In most cases of paediatric diarrhoea, antibiotics are not needed unless the diarrhoea is caused by a confirmed bacterial infection. Anti-diarrhoeal medicines that reduce gastrointestinal motility are not recommended in children, as they can worsen the condition by slowing down the removal of harmful pathogens from the intestines.[5]

When to refer to the doctor or clinic

The pharmacist's assistant should know when a case of diarrhoea requires referral to the doctor or clinic. Referral is necessary in the following situations:

- The child shows signs of severe dehydration (e.g. sunken eyes, lethargy, or no urination).
- The child has blood in their stool, which can indicate a bacterial infection.
- The diarrhoea persists for more than one day.[9]
- The child is younger than one year of age, particularly younger than six months old.
- The child has passed more than five diarrhoeal stools in the previous 24 h.
- The child has frequent diarrhoea and/or vomiting.
- The child has a high fever (above 38.5 °C).[5,6,9]

Conclusion

Paediatric diarrhoea is a common and potentially serious condition. The primary concern in managing diarrhoea is preventing dehydration through the timely use of oral rehydration solutions (and zinc supplementation). The pharmacist's assistant is in a key position to educate caregivers on the correct use of these treatments

Table I: Management of paediatric diarrhoea

Management of paediatric diarrhoea	Example of available product	Recommended doses
Rehydration		
Electrolytes with carbohydrates	Hydrol Rehidrat Scripto-Lyte	Dissolve 1 sachet in 1 litre water. Discard unused solution after 24 hrs Dissolve 14 g in 250 ml water Dilute 30 ml in 150 ml water **Note:** Use boiled cooled water to dissolve or dilute and administer small volume as required.
Intestinal adsorbents		
Kaolin, Pectin combinations	Enterolyte Gastropect Kaostatex	**3–5yrs**: 15–20 ml; **6–11 yrs**: 30–40 ml given 3-4 times a day 2.5–15 ml 3–4 times daily **1–5 yrs**: 5 ml 4 hrly; **6–11 yrs**: 10 ml 4 hrly
Diosmectite	Smecta	**children < 1 yr use** 1 sachet daily; **1–2 yrs** 1–2 sachets daily; **2 yrs and older** 2–3 sachets daily

Note: Drugs reducing gastrointestinal motility are available for the symptomatic management of diarrhoea, but should not be used in children.

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and the importance of continued feeding during diarrhoeal episodes. Additionally, educating families on hygiene practices, the importance of vaccines, and proper nutrition can significantly reduce the incidence of diarrhoea. Knowing when to refer a child to the doctor or clinic is also crucial in ensuring timely treatment and preventing complications.

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Summer **skin care**

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Abstract

As temperatures rise, summer skincare should focus on hydrating and protecting the skin. Adequate hydration and moisturisation in warmer weather will help maintain the elasticity, suppleness and overall health of the skin. Topical sunscreens are designed to protect the skin from the harmful effects of the sun's ultraviolet (UV) rays. The ideal sunscreen is the one the patient will use diligently.

Introduction

Summer brings fun, sunny weather but also potential damage to skin. The scorching heat, harmful UV rays, and extreme humidity variations can lead to various skin problems if proper care is not taken. Dry skin, breakouts and sunburn are amongst the concerns the warmer conditions bring, and the resulting long-term damage of pigmentation, fine lines and skin cancer can be curtailed with sensible skincare routines. Hydration and sun protection are essential for maintaining healthy skin.[1]

Common summer skin concerns

Dry skin

Summer heat as well as chemicals and salt from pool- and sea-water can cause excessive skin dryness and sensitivity. Similarly, air conditioning removes essential moisture from the skin.[2] While it is important to moisturise and keep skin hydrated on the outside, it's equally important to stay hydrated from the inside by drinking six to eight glasses of water per day and eating foods with high water content, such as fruits and vegetables.[3]

Breakouts

Acne may worsen in the summer months because of humidity and perspiration, with occlusive and oily sunscreens contributing to the problem. Advise patients to cleanse with an appropriate facewash to target blocked follicles. Ingredients like salicylic acid and glycolic acid help remove dead surface skin cells. Squeezing or scratching acne spots could lead to pigmented marks and blemishes with sun exposure.[2] Patients should also be advised to allow the skin to breathe by wearing lighter cosmetics in summer.[4]

Sunburn

Harmful UV rays from the sun can damage the DNA of skin cells, causing sunburn, photo-ageing (fine lines, wrinkles, solar keratosis) pigmentation and an increased risk of skin cancer.[1,2] Sunscreen offers the best protection against skin cancer other than staying out of the sun altogether. If a patient presents with sunburn, cool showers to soothe skin and remove any sweat or sunscreen residue should be advised, followed by an after-sun moisturiser or aloe vera gel to soothe the affected areas. An analgesic or anti-inflammatory such as paracetamol or ibuprofen can also reduce the inflammation and tenderness. Picking at peeling skin should be avoided to prevent scarring.[1] If the patient is in significant discomfort, referral for medical attention should be considered.

Summer skin care routine

Cleanse

When it is hot, patients may feel the need to wash constantly. The body makes natural moisturising factors that hold water in the skin – when washed away, the skin can dehydrate. Advise showering once daily and rinsing the face with a gentle cleanser and lukewarm water morning and night, avoiding overly hot showers and baths as this can strip natural skin oils. After cleansing, the skin should be patted dry with a soft towel.[3]

Exfoliate

Sunscreen and sweat can both clog pores. Gentle exfoliation once or twice a week using a mild scrub or chemical exfoliant like hydroxy acids will help unclog pores and reduce blemishes by removing the debris. Advise patients not to exfoliate sunburnt skin but rather to allow the skin to heal first.[4]

Moisturise

For maximum absorption, moisturiser should be applied after cleansing to warm, slightly damp skin.[2] Focus on ingredients like hyaluronic acid, aloe vera and glycerin, which help retain moisture and keep skin plump and hydrated. Lighter, gel-based skincare products won't clog pores. Remind patients to also moisturise their lips and the delicate skin around their eyes.[5]

Sun protection

A sunscreen is a photoprotective compound that uses agents to block, deflect or reflect the sun's UV rays.[6] Applying sunscreen is something everybody regardless of age, gender, skin type, or skin tone should do every day, all year long, even on cloudy days. Clouds cannot stop UV rays.[7] While UVB rays can't penetrate glass, UVA rays can, which leads to collagen degradation and may accelerate signs of ageing on the skin. Therefore, protection is still necessary even indoors or when driving.[1,4]

The efficacy of any sunscreen will depend on the product's formulation. SPF stands for "sun protection factor", and is how the protection from the sun's UVB rays is measured.[8] Sunscreens that include SPF 30 or higher and are labelled "broad-spectrum" and "water-resistant" have been proven to shield skin from both UVA and UVB rays, which are responsible for aging and burning, respectively. Areas like the lips, ears, back of the neck, and tops of the feet and hands are often overlooked but equally vulnerable to sun damage.[2,3]

Chemical sunscreen vs. physical sunscreen

There are two main types of active ingredients known as UV filters in sunscreens that protect the skin from the sun's rays:

- Physical barriers (mineral sunscreen) and
- Chemical barriers (chemical sunscreen).[7]

Chemical sunscreens use ingredients that are absorbed in the top layer of skin where they work like sponges to absorb damaging UV rays and convert them into non-damaging heat energy which is then released before it can harm the skin. Since chemical sunscreens need to be absorbed into the skin, they must be applied at least 30 minutes before sun exposure.[9]

Physical sunscreens, sometimes called "natural or mineral" sunscreens, include ingredients which sit on top of the skin and scatter, block or deflect the sun's rays, acting like a shield, by creating a protective film on the skin's surface to help reflect UV rays before they penetrate the skin.[7]

Antioxidants

The sun can cause unstable molecules, called free radicals, to damage skin cells. Antioxidant-rich products (e.g. Fernblock®) can stabilise those free radicals and promote collagen production.[1,3,10]

Conclusion

Proper skincare during the summer involves not only protecting the skin from the sun but also ensuring it stays hydrated, exfoliated and well-nourished.[3] It's essential to apply sunscreen daily to reduce the risk of skin cancer, no matter the weather. Ideally, a broad-spectrum SPF30+ sunscreen should be reapplied every two hours when outdoors.[2] Choosing products and practices that suit the individual skin type and that the patient will use consistently is key.[5]

Sunscreen product guidelines

In addition to sunscreen, wearing the right clothing, wide-brimmed hats and sunglasses can provide an extra layer of protection from the sun's harmful rays.[3]

Classification	Active ingredients	Benefits	Limitations	Examples
Mineral	Zinc oxide Titanium dioxide	Suitable for sensitive or acne-prone skin. Better for preventing pigmentation sun damage. Can be layered on top of other skincare products.	Thicker, heavier formulations. Can leave a white chalky cast on skin. Need more frequent application.	Sun Lab® Clear Zinc Oxide SPF40. Oh-Lief® Natural Body Sunscreen SPF30. ISDIN® UV Mineral Brush SPF50+*
Chemical	Oxybenzone Avobenzone Octisalate Octocrylene Homosalate Octinoxate	Better on darker skin. Lightweight, used in face creams and sprays. Easier to apply. Non-chalky.	Can irritate sensitive skin. Should be applied before moisturiser to allow penetration. 30 minutes to become effective.	Xeroderm® SPF30. Nivea® Sun dry touch spray SPF50. ISDIN® Fusion Gel Sport SPF50.
Hybrid	Combine both mineral and chemical sun filters.	Offer benefits of mineral sunscreen with cosmetic appeal of chemical sunscreens. Lightweight. Blends seamlessly on all skin tones, without leaving behind any white residue.[7] Fast absorption. Good option for sportsmen.	Increased risk of sensitivity.	Solace® Sunscreen Lotion SPF50. Cetaphil® Sun Gel-Cream SPF50. Everysun® Sensitive Care Spray SPF50. Bioderma® Photoderm Aquafluide Light SPF50+** Heliocare® 360 Age Active Fluid SPF50 ***

*Powder-based mineral sunscreens are translucent and conveniently applied with a brush.[6]

**Hyperpigmentation-prone individuals can opt for tinted sunscreens containing iron oxide, an inorganic chemical used as colourant to help protect against High Energy Visible Light.[11]

***Added antioxidant benefit of Fernblock®

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Oats: food for dry skin

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Abstract

Dry skin, also known as xeroderma, is more common in winter but can result from sun damage, harsh soaps, and overbathing. Dry skin doesn't retain enough moisture to keep it feeling soft but is usually harmless and only causes temporary discomfort. Dry skin is easy to recognise by its appearance; gently scratching the skin surface – it will quickly flake if it is dry.

Introduction

Dryness makes the skin look and feel rough, itchy, or scaly, and may result in colour changes, redness, fine lines, or cracks and even bleeding. The location varies, but it is usually found on hands, feet, elbows, and legs. Presentation of and predisposition to xeroderma differ based on age, health status, genetics, medical conditions, skin tone, environment, and sun exposure.[1,2]

The surface of the skin is home to a variety of bacteria, fungi and viruses, known as the skin *microbiome*, which all play an important role in keeping the skin healthy and hydrated. The microbiome is an invisible ecosystem of helpful and harmful microorganisms living on the skin. A healthy microbiome acts as the skin's natural protective shield. As the skin is the body's largest organ, it is a vital barrier against threats which could affect overall health. If the balance between these good and bad "germs" becomes disturbed, the skin barrier will lose water and will not be an effective defence against attack by disease-causing microorganisms. Similarly, if this protection is compromised by dehydration, it becomes unbalanced and vulnerable.[3] Therefore, it is essential to maintain both the microbiome and moisture levels of the skin to prevent dry skin.

Treatment

To effectively manage dry skin, it is important to address the underlying causes as well as finding ways to improve the moisture maintenance of the skin.

The first step is to reduce exposure to factors that cause dry skin, such as harsh soaps, hot water, and low humidity environments. Anti-bacterial soaps which strip the skin of its healthy bacteria damage the microbiome – gentle, fragrance-free cleansers are thus recommended. Limiting bath or shower duration to 5–10 minutes with warm (not hot) water can help retain the skin's natural oils. Applying a moisturiser while the skin is still damp, immediately after a bath or shower, is supportive in sealing moisture into the skin surface. Using a humidifier in living or working spaces, especially during winter months, can help maintain adequate moisture levels in the air and prevent further dryness. Air conditioners and heaters also dry out the air, so avoid overusing them in dry winter weather. Wearing protective clothing, such as gloves when exposed to irritants or cold weather, can also minimise skin damage.

As the primary treatment goals are to restore the skin barrier function, replace moisture, and prevent further dryness, so the next step is to choose a moisturiser based on the severity of dryness and the specific area of the body. For severely dry skin, thick, greasy moisturisers like petroleum jelly or colloidal oatmeal-based products may be more effective. For less severe cases, lighter moisturisers containing glycerin or ceramides can be beneficial. Moisturisers are usually labelled as lotions, creams, or ointments. Both lotions and creams are typically a mix of water and droplets of oil. The main difference between lotions and creams is the water content, which also dictates the thickness. Lotions contain more water than creams and are, therefore, thinner, less greasy, and more readily absorbed by the skin. Lotions are typically formulated with lightweight ingredients such as hyaluronic acid and are suitable for normal to slightly dry skin.[4] Creams generally have a 50–50 ratio of water and oil, are thicker in consistency and feel greasier than lotions, providing a barrier that keeps skin ultra-hydrated. They contain heavier ingredients, such as lanolin and shea butter, that form a film between the skin and the environment, preventing

moisture from escaping. Ointments have the highest oil content (around 80%) of the moisturiser types, and typically form a layer on top of the skin rather than being absorbed immediately. Ointments, with their thicker consistency, are especially useful in treating very dry, cracked skin as they effectively protect the skin from the elements and prevent further moisture loss.[5]

The different types of ingredients normally included in moisturisers are:

1. Occlusives –a type of ingredient that seals in moisture to prevent water loss from the skin, providing a protective barrier, helping skin feel more hydrated and guarding against outside factors that could cause irritation. Examples are petrolatum, silicone, and lanolin.
2. Humectants have ability to 'grab' water from the surroundings, and from the humidity in the surrounding air. This additional moisture then smooths and plumps skin. Ingredients that are considered humectant are glycerin, hyaluronic acid, and urea.[5]
3. Emollients are ingredients inside moisturisers that fill in the gaps in dry skin with fatty substances or lipids, helping the skin become softer and smoother. Various types of emollients are available, such as ceramides, glyceryl stearate, and soy sterols.[6] Ceramides are found naturally in skin cells, helping to create and support the skin's barrier – keeping moisture in and irritants out. Synthetic ceramides are well-tolerated and widely used in moisturisers.[7] Emollients can also have humectant or occlusive properties.

A word on AVEENO® moisturisers and dry skin

AVEENO® has 'balanced science and nature, using the "power of oats" to treat dry skin.'

- Oats, or *Avena Sativa*, contain proteins, vitamins B and E, and lipids that lock in moisture by attracting water to the skin and forming a protective barrier.
- Oats help to support the skin's microbiome.
- Oats also have natural antioxidant and anti-inflammatory benefits and gently exfoliate dry, dead skin cells.[8]

The Prebiotic Oat formula in Aveeno® Moisturisers are clinically proven to help keep the skin microbiome balanced, promoting skin health and hydration. The prebiotic oats help replenish skin's natural barrier and support its natural ecosystem. In 2003 the Food and Drug Administration (FDA) officially categorised colloidal oatmeal as a skin protectant, meaning it can be effective at relieving dryness, skin irritation, and itching due to dry skin conditions like eczema.[3,8]

The ingredients utilised in the AVEENO® range include:

- OAT EXTRACT is known for soothing and potent antioxidant properties.
- COLLOIDAL OATMEAL has moisturising properties that help prevent water loss from the skin.
- OAT OIL is naturally rich in lipids which are essential components for a proper functioning skin barrier.
- CERAMIDE 3 is essential for maintaining skin barrier function and preventing water loss from the skin.[9]

The range is dermatologically tested, has no added fragrances, and the preservatives used are well-tolerated, making it an ideal range for all skin types.

AVEENO® Daily Moisturising Body Lotion is formulated with Prebiotic Colloidal Oats to help replenish skin's natural moisture. It is formulated for normal to dry skin and is clinically proven to hydrate for 48 hours, leaving skin feeling soothed and comfortable.[10]

AVEENO® Skin Relief Moisturising Lotion formulated with a Prebiotic Triple Oat Complex and shea butter. The formula is clinically proven to restore and strengthen the protective skin barrier, giving relief in 60 seconds and intensely hydrating for 72 hours. This variant is indicated for very dry and itchy skin.[11]

AVEENO® Dermexa Daily Emollient Cream formulated with a Prebiotic Triple Oat Complex and Ceramides, this formula moisturises and protects very dry, itchy skin, for immediate comfort. Suitable for babies, children, and adults, sensitive and even eczema-prone skin. This variant is pH balanced, unscented and vegan.[12]

Conclusion

Most cases of dry skin respond well to moisturising, lifestyle changes and home remedies but a pharmacy customer may need to be referred to a doctor or dermatologist if symptoms persist or become painful, if the discomfort causes disruption to daily routines, if infections arise or there are large scaly areas.[2]

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Nutrition and healthy brain development in children

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Abstract

Nutrition plays an essential role in brain development, from conception to childhood and beyond. Poor nutrition during pregnancy and early childhood is detrimental to the growing child's development. Indeed, deficiencies of multiple nutrients during this critical period can have lasting negative effects. Some nutrients important for brain development include protein, omega-3s, iron, choline, iodine, zinc, folate and vitamin B_{12}. If nutrient requirements cannot be met through diet alone, supplements containing these key nutrients may help to support brain development in children.

Introduction

All humans depend on essential nutrients such as proteins, fats, carbohydrates and micronutrients to grow and function.[1] Adequate nutrition is particularly important during the first 1 000 days of a child's life. This period describes the vulnerable time between conception and a child's second birthday, during which crucial growth and development need to take place.[2] During this time, foundations are laid down for cognitive skills such as attention, perception, learning and language.[3] Children that are not supported by good nutrition in early life are more likely to experience problems with cognitive and motor development, as well as difficulties with social skills and academic performance.[1] Ensuring proper nutrition during pregnancy and in the early years of a child's life is crucial for healthy brain development. Nutritional supplementation during pregnancy, lactation and in early childhood may help to promote healthy brain development.[1,2]

Stages of brain development

The prenatal period

A child's brain starts developing in the womb at as early as three weeks and continues into early adulthood. Pregnant women have increased nutrient requirements and are advised to follow a nutrient-rich diet consisting of vegetables, fruit, whole-grains, legumes, low-fat dairy, lean meat and healthy fats.[4] Nutrient deficiencies during pregnancy can affect the health of both mother and child. For example, maternal folate deficiency during pregnancy is associated with an increased risk of congenital conditions such as spina bifida.[2] Inadequate iron intake may result in iron-deficiency anaemia in mothers and negatively affects infant growth and development. Vitamin B_{12} is also essential for neural development and supplementation of B_{12} is linked to better cognitive outcomes in children.[5] It can be difficult to meet the increased nutrient needs of pregnancy through diet. Supplementation of key nutrients such as folic acid, iron, B_{12}, choline and essential fatty acids is recommended during pregnancy to support the health of both mother and child.[4]

Infancy

During infancy, the brain undergoes significant and rapid growth and is dependent on adequate nutrition to lay the foundations for learning capacity, as well as psychological and emotional well-being.[6] Mothers who breastfeed are encouraged to continue taking their prenatal supplements to prevent nutrient deficiencies. The World Health Organization (WHO) recommends that mothers exclusively breastfeed their infants for the first six months of life and continue breastfeeding for two years and beyond. Breastfeeding provides benefits to both mother and child and positively affects infant brain development. Whether breast- or bottle-fed, infants rely heavily on good nutrition to optimise both physical and mental growth and development.[7]

Early childhood

During the pre-school years, children acquire important skills such as memory and attention control. Those who do not get enough energy, protein, and essential fats in their diets during this time are more likely to experience delays in brain development.[2] Adequate iron intake is also crucial during early childhood, as iron-deficiency anaemia negatively affects cognitive outcomes. Similarly, a lack of zinc has been associated with poor brain development and function, as well as difficulties with attention and short-term memory. Although a nutritious and varied diet is recommended to meet requirements, the use of nutritional supplements is recommended for children at risk of malnutrition.[1,2]

Late childhood and adolescence

Although not as rapid as the first 1 000 days of life, physical and mental development in children continues through late childhood and adolescence. Nutritional support during this critical period has been shown to influence school performance and determine entry into high school and further education.[1]

Nutrients for brain health

Key nutrients important for brain health and development include protein, omega-3 fatty acids, iron, zinc, choline, iodine, folate and vitamin B_{12}.[1,2] Whether during pregnancy, lactation or during childhood, the best way to meet nutritional requirements is through a healthy diet.[2] If nutrient requirements cannot be met through dietary changes, supplementation may be useful.[1,2]

Macronutrients

Macronutrients are energy-containing foods needed by the body in relatively large amounts. Carbohydrates, proteins and fats are macronutrients, and each play a role in the development and function of the brain.[4] Insufficient intake of carbohydrates and protein can lead to undernutrition, which impairs growth and is linked to multiple psychological issues later in life. Furthermore, inadequate intake of essential fats may be detrimental to brain health. The brain contains a high concentration of fats, which play a vital role in growth, structure and function of the brain and nerves. Omega-3 fatty acids are important fats required for brain function and are found in foods like fatty fish, chia seeds and walnuts.[4] Poor intake of omega-3s is associated with impaired neurodevelopment as well as visual recognition and memory issues. Increasing omega-3 intake through diet or supplementation improves brain health.[5]

Iron

Iron is a mineral responsible for transporting oxygen around the body and helps to form neurological connections for proper brain development.[2] Iron deficiency is the most common nutrient deficiency in the world and has significant health consequences, especially among pregnant women and young children.[5] Iron is found in foods like eggs, lean meat, seafood, spinach and legumes.[8] Iron supplementation is recommended for pregnant and lactating women. Young children may also need an iron supplement if dietary intake is poor, and they are at risk of deficiency.[2]

Zinc

Zinc is a micronutrient that performs many functions in the body and helps maintain brain structure and function. Zinc deficiency in early childhood can cause growth stunting, developmental delays and negatively affects short-term memory and attention span.[2] Foods like meat, seafood, nuts and wholegrains contain zinc, but supplementation may be required in some instances.[8]

Choline

Choline is an essential nutrient important for cell structure and brain function. Found in foods like eggs and meat, it affects neurotransmitter function and is important for brain development. Supplementation with choline can help support optimal brain development during pregnancy, breastfeeding and beyond.[2,8]

Iodine

Iodine is a trace mineral important for hormone synthesis and brain development.[2] Iodine is found in dairy, eggs, seafood and iodised salt. Deficiency is rare but can result in significant intellectual disability if it occurs.[2,8]

Folate

Folate is a water-soluble vitamin needed for DNA synthesis and nervous system function. Folate is naturally found in wholegrains, meat and green leafy vegetables. The synthetic form of folate is called "folic acid", and supplementation is advised during pregnancy and breastfeeding to support healthy brain and nervous system development of the child.[2,8]

Vitamin B_{12}

Vitamin B_{12} is important for many body functions and plays a role in neurotransmitter synthesis. Inadequate intake of vitamin B_{12} is linked to the development of neurological disorders. As vitamin B_{12} is mainly found in animal-derived products, people following a vegan or vegetarian diet are at risk of deficiency.[2,4,8] Supplementing pregnant women with vitamin B_{12} improves cognitive outcomes in children.[5]

Nutrient supplements

In addition to a healthy and varied diet, nutritional supplementation during pregnancy, breastfeeding, and early childhood can help

Table I: Prenatal supplements

Product	Protein	Omega-3	Iron	Zinc	Choline	Folic acid	Vitamin B_{12}
iNova Pharmaceuticals: PregOmega® Plus		√	√	√		√	√
AnaStellar Brands: Stellar Mama®		√	√	√		√	√
Nativa: Mom2Be®Pregnancy Shake	√		√	√		√	√
Futurelife®: Mothers Food™	√	√	√	√	√	√	√
Abbott: Similac® Mum	√	√	√	√	√	√	√

Table II: Supplements for children

Product	Protein	Omega-3	Iron	Zinc	Choline	Folic acid	Vitamin B12
Vi-Daylin Multivitamin Drops with iron (< 4 years)			√			√	√
Zinplex® Junior Multivite Syrup				√			√
Brainchild™		√	√	√		√	√
Abbott Paediasure®	√	√	√	√	√	√	√
Replace® Junior	√	√	√	√	√	√	√

prevent deficiencies and support healthy brain development.[1,2] Tables I and II provide examples of supplements available at the pharmacy that contain key nutrients to optimise brain development. However, it is crucial that supplements are used under medical guidance, as excessive or incorrect intake of certain nutrients can be harmful.

Conclusion

Good nutrition is essential for brain health and development of growing children. Nutrient deficiencies during pregnancy, early childhood and beyond can have lasting negative effects on cognitive well-being. Supplements can help meet increased nutrient requirements and prevent deficiencies during critical periods of brain development. Supplements should be used with caution, and it is advised to always take a "food first" approach before considering their use.

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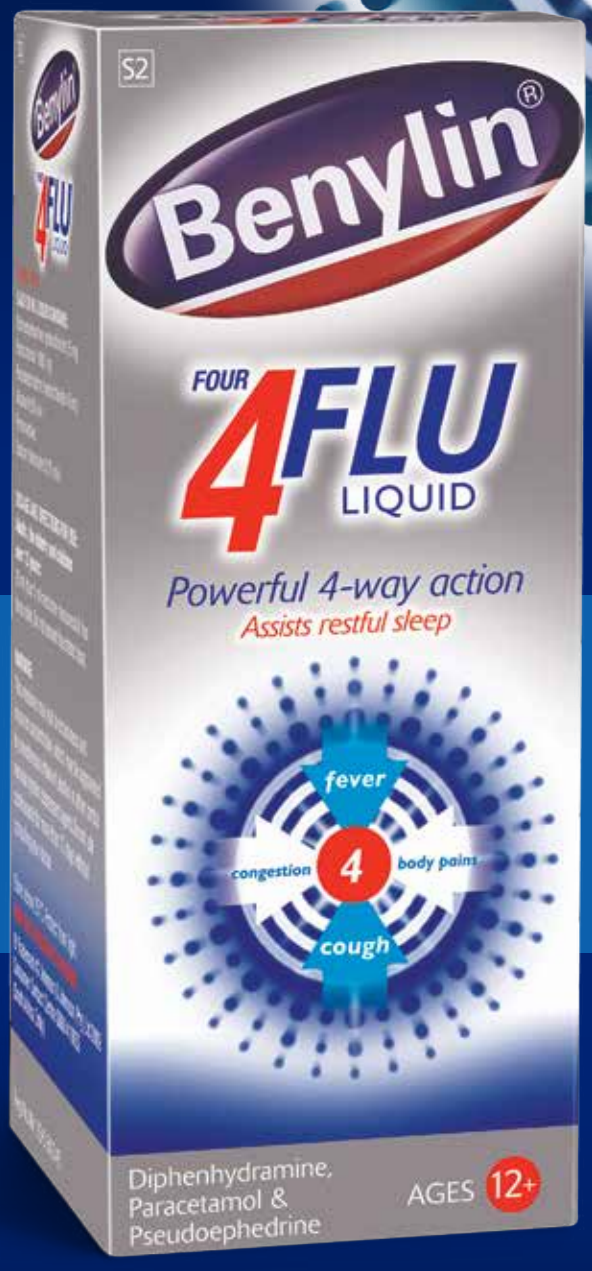

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