

PHYSIOTHERAPY ROLE IN PSORIASIS AND PSORIATIC ARTHRITIS

Abstract

Psoriasis and psoriatic arthritis (PsA) are a difficult pair of inflammatory diseases that have a significant impact on people's skin and joints. This abstract explores the critical function of physical therapy in the all-encompassing care of individuals with psoriasis and PsA. Because PsA causes inflammatory joint issues and psoriasis presents as persistent, scaly skin patches, effective treatments requires a multidisciplinary approach.

Physiotherapy is a vital component in the treatment of both diseases because it provides a range of therapies specifically designed to address the special difficulties associated with psoriasis and PsA. A key element is exercise regimens, which are carefully crafted to maintain joint flexibility and improve muscle strength. Targeted workouts and ultrasonography are examples of complementary physiotherapeutic treatments that can reduce pain and inflammation and promote better physical function.

Physiotherapy has an impact on the psychosocial components of psoriasis and PsA in addition to the physical domain. In order to improve mental health, therapists work with patients to create coping skills, stress reduction plans, and all-encompassing methods. This integration acknowledges, in the context of chronic autoimmune disorders, the complex relationship between emotional resilience and physical health. Physiotherapists equip patients with proactive management methods, emphasising early intervention and prevention. Customised exercises reduce symptoms and may even slow the evolution of the condition, reducing the chance of long-term disability,

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when combined with ergonomics and joint protection education.

The summary concludes by highlighting the crucial part that physiotherapy plays in the comprehensive care paradigm for PsA and psoriasis. Physiotherapists play a vital role in improving the overall quality of life for those coping with the complicated interplay between rheumatic and dermatologic manifestations of chronic autoimmune disorders.

Keywords: Medical science, Physiotherapy, joint disease

I. INTRODUCTION

Psoriatic arthritis is a progressive inflammatory joint disease that is often associated with psoriasis, a skin condition. This chronic condition can affect both peripheral joints and the axial skeleton, leading to symptoms such as pain, stiffness, swelling, and potential joint damage. While the joint pathology progresses slowly, it is typically more of an inconvenience than a disabling condition. Psoriatic arthritis is classified as a seronegative spondyloarthropathy, indicating that certain factors present in rheumatoid arthritis are absent in the blood tests.

Psoriatic arthritis affects both men and women equally. In the majority of cases, individuals first experience skin symptoms of psoriasis before developing arthritis symptoms. However, in approximately 15% of cases, arthritis symptoms are noticed before psoriasis appears. Conversely, another 15% of cases involve a simultaneous diagnosis of psoriatic arthritis and psoriasis.

Physiotherapy plays a crucial role in enhancing the quality of life for individuals with psoriatic arthritis. The management of physiotherapy should primarily concentrate on education, improving range of motion, strengthening muscles, and enhancing overall cardiovascular fitness. In addition, physiotherapists may employ ultraviolet (UV) rays as a treatment modality to alleviate swelling and tenderness in affected joints.

Patients with psoriatic arthritis often experience stiffness in their joints and muscle weakness due to reduced usage. This lack of activity can lead to impairment. However, exercise serves as a significant intervention that patients can utilize to prevent or minimize such impairments from occurring. By incorporating exercise into their routine, individuals with psoriatic arthritis can effectively manage their symptoms and enhance their functional abilities.

II. DEFINITION

Psoriatic arthritis is an autoimmune disease with a chronic nature, characterized by both skin inflammation (psoriasis) and inflammation in the joints (inflammatory arthritis).

Incidence: Around 15-25% of individuals with psoriasis also experience associated joint inflammation known as psoriatic arthritis. Typically, the onset of psoriatic arthritis occurs during the fourth and fifth decades of life, affecting both males and females equally. In approximately 15% of patients, arthritis symptoms may appear before the development of psoriasis. However, in some cases, diagnosing psoriatic arthritis can be challenging, especially when arthritis symptoms precede psoriasis by several years.

Psoriatic arthritis is not limited to joint inflammation but is a systemic rheumatic disease that can trigger inflammation in various body tissues beyond the skin and joints. These areas may include the eyes, heart, lungs, and kidneys. Psoriatic arthritis shares common symptoms with other arthritic conditions such as ankylosing spondylitis, reactive arthritis, and arthritis associated with Crohn's disease and ulcerative colitis. Inflammation of the spine and other joints, as well as the involvement of the eyes, skin, mouth, and various organs, are characteristic features of these conditions.

Due to their similarities and tendency to cause spinal inflammation, these conditions are collectively referred to as spondyloarthropathy.

Spondyloarthropathy is a term used to describe a group of conditions that share two common characteristics. Firstly, there is the presence of arthritis that affects the spine or extremities, and often runs in families, indicating a genetic component. Secondly, inflammation occurs in the ligaments, tendons, and occasionally even in organs such as the eyes.

III. INCIDENCE

Psoriatic arthritis is observed in a prevalence range spanning from 6% to 42% among individuals afflicted with psoriasis. In comparison, the general population holds an estimated psoriasis prevalence of roughly 2%. Within the United States, the occurrence of psoriatic arthritis is estimated at 0.1% to 0.25% of the populace. The distribution of this condition is even between males and females. While psoriatic arthritis can manifest across various age groups, it predominantly emerges between the ages of 30 and 40. A compelling factor is that having a first-degree relative with the disorder escalates the risk of developing psoriatic arthritis by 80-90%.

IV. CAUSES

1. Genetic Factor

- Genetic components are deemed to contribute to the genesis of psoriatic arthritis, although the exact genes or markers responsible are yet to be identified.
- The risk of acquiring the disease escalates by 80-90% with the presence of a first-degree relative with psoriatic arthritis.
- Ongoing genome investigations are actively underway to pinpoint potential biomarkers linked to psoriatic arthritis.

2. Environmental Factor: The potential triggering of psoriatic arthritis can result from trauma and injury.

3. Immunological Factor:

- The immune system's role is considered pivotal in the emergence of psoriatic arthritis.
- Joints of individuals with psoriatic arthritis exhibit elevated levels of cytokines, the inflammatory messengers released during T-cell activation.
- Tumor necrosis factor, a distinct cytokine, is notably abundant in the skin, blood, and joints of patients grappling with psoriatic arthritis and psoriasis.

Tumor necrosis factor (TNF) assumes the responsibility of regulating inflammation within the body, typically existing at low levels. However, escalated TNF levels can give rise to systemic inflammation. The inhibition of this specific cytokine has demonstrated noteworthy alleviation of psoriatic arthritis symptoms.

V. TYPES

Psoriatic arthritis can manifest in various types, depending on the distribution of joint involvement. There are five main types of psoriatic arthritis:

- 1. Symmetrical Polyarthriti:** This type affects joints on both sides of the body. Five or more joints are typically involved, showing a symmetrical pattern throughout the body.
- 2. Asymmetrical Oligoarticular:** This is the most common type, accounting for 70% of cases. It affects four or fewer joints in an asymmetrical pattern.
- 3. Spondyliti:** Inflammation primarily occurs in the spine, particularly in the neck, lower back, and sacroiliac joints. It may coincide with symptoms in the extremities.
- 4. Distal Interphalangeal Joint Involvement:** Only the distal interphalangeal joints of the fingers or toes are affected. Nail changes are often observed in this type.
- 5. Arthritis Mutilans:** This type of psoriatic arthritis is characterized by severe joint damage that can progress rapidly. It is less common compared to other types.

Arthritis mutilans is the most severe and destructive form of psoriatic arthritis. It is characterized by the mutilation and deformation of the small joints in the fingers and toes. The affected joints may become swollen, leading to a sausage-like appearance of the fingers. It is important to note that arthritis mutilans is a rare subtype, occurring in less than 1% of all psoriatic arthritis cases.

In summary, psoriatic arthritis can present in different ways, including symmetrical polyarthriti, asymmetrical oligoarticular, spondyliti, distal interphalangeal joint involvement, or arthritis mutilans, with each type exhibiting distinct patterns of joint affection and potential consequences.

VI. PATHOLOGY

The pathophysiology of plaque psoriasis has initially illuminated the underlying biological mechanisms of psoriatic arthritis. Progress in the fields of immunology and skin biology has unveiled molecular pathways that connect these two conditions. Studies focusing on plaque psoriasis have pinpointed Th1 and Th17 cells as pivotal drivers of the fundamental pathobiology (Di Cesare et al., 2009; Lowes et al., 2008; 2014).

As per the prevailing model, infection or traumatic incident triggers keratinocyte cell demise, releasing cathelicidin LL37. This LL37, when engaged with keratinocyte DNA, activates toll-like receptors (TLRs) on plasmacytoid dendritic cells within the skin. This activation prompts the emission of various signaling proteins, including interferon α (IFN α) (Lowes et al., 2014). IFN α proceeds to activate dermal myeloid dendritic cells, facilitating their journey to the lymph nodes.

Within the lymph nodes, naïve T-cells embark on two distinct paths. The secretion of IL12 guides the differentiation of naïve T-cells into Th1 cells, which produce interferon γ

(INF γ) and tumor necrosis factor (TNF)- α . Conversely, dendritic cells secrete IL23, which spurs naïve T-cells to differentiate into Th17 cells (Di Meglio and Nestle, 2010). The inhibition of IL23 is also becoming a target in the development of drugs for psoriasis (Kopp et al., 2015).

In the realm of psoriasis, Th1 and Th17 cells re-enter the circulation and return to the skin, where they release cytokines like IL17, IL21, and IL22. Research indicates that IL21 and IL22 foster keratinocyte proliferation, leading to the distinctive silvery hyperkeratotic skin manifestation in psoriasis (Nestle et al., 2009). Elevated levels of IL12 and IL23 have been detected in spondyloarthropathy patients, including those with psoriatic arthritis, in both their peripheral blood and synovial fluid (Wendling et al., 2009).

The IL23/Th17 axis plays a role in various clinical aspects of psoriatic arthritis. Animal models have displayed that IL23 administration induces enthesitis, accompanied by heightened levels of IL6, IL17, and IL22. Blocking IL23 with antibodies prevents the onset of enthesitis, underscoring its crucial significance (Sherlock et al., 2012; Fitzgerald and Winchester, 2014). TNF α and IL17 within the IL23/Th17 pathway contribute to the altered bone resorption and new bone formation seen in psoriatic arthritis. Agents that inhibit TNF or IL17 have demonstrated effectiveness in curbing bone damage (Ritchlin et al., 2003; Sato et al., 2006).

While the mechanisms accountable for new bone formation in psoriatic arthritis are not fully grasped, IL22, bone morphogenetic protein, and agonists in the Wnt signaling pathway are considered potential instigators of this process. Further exploration is needed to illuminate the intricacies of these pathways and their involvement in psoriatic arthritis (Benham et al., 2014).

VII. PATHOLOGICAL CHANGES

- 1. Epidermis:** Psoriasis involves an accelerated cell replication rate within the stratum germinativum, resulting in thickening of the stratum spinosum due to both increased cell numbers and edema. The stratum granulosum is notably absent, while the strata lucidum and corneum are substituted by multiple layers of incompletely keratinized nucleated soft cells referred to as para-keratotic cells. This disruption impairs the usual process of skin layer turnover and maturation, accumulating adhesive cells on the surface that do not naturally shed like typical keratinocytes. These cells gather and manifest as scales, eventually drying out within 2-3 weeks before sloughing off as substantial flakes.
- 2. Dermis:** Psoriasis contributes to dilation of capillaries within the dermal layer, resulting in heightened blood circulation. The papillae, small projections connecting the dermis with the epidermis, undergo elongation. Furthermore, indicators of inflammation emerge within the dermal tissue.

VIII. CLINICAL SIGNS AND SYMPTOMS

- 1. Skin Lesions:** Psoriasis presents with distinct, dry, red papules and plaques that frequently overlap. These patches are typically devoid of itchiness and are commonly situated on the extensor surfaces of the elbows, knees, as well as the back and buttocks.

- 2. Nail Lesions:** Nail involvement in psoriasis materializes as pitting, ridges, discoloration (brown or yellow), fissures, and separation or loosening of nails. These nail alterations often manifest in patients with a higher predisposition to developing arthritis.
- 3. Arthritis:** Arthritis can manifest early and be a severe symptom in around half of psoriatic arthritis patients. Joints like wrists, ankles, knees, and elbows are frequently affected. Patients may encounter morning stiffness, tenderness, inflammation, and redness in the affected joints.
- 4. Soft Tissue Involvement:** Psoriatic arthritis extends its impact to soft tissues, causing tenderness at the points where tendons insert or muscles attach. This phenomenon is frequently observed in conditions such as Achilles tendinitis, plantar fasciitis, and inflammation of the flexor tendons in the hand.
- 5. Dactylitis:** Dactylitis, colloquially known as "sausage fingers," is a distinctive feature observed in approximately a third of individuals with psoriatic arthritis. It entails swelling of the entire finger, rendering it a sausage-like appearance
- 6. Extra-Articular Features:** Psoriatic arthritis is linked with various extra-articular manifestations, including iritis (inflammation of the iris), urethritis (inflammation of the urethra), mouth ulcers, colitis (inflammation of the colon), and, less frequently, aortic valve disease

IX. CLINICAL PRESENTATION

- Psoriatic arthritis is marked by joint inflammation, pain, stiffness, and swelling, encompassing not only joints but also ligaments and the points where tendons attach.
- In its initial stages, this condition primarily targets the synovial tissue encompassing tendons and the joint capsule. As the ailment advances, tendons and bones can also become affected. In certain instances, substantial joint deterioration may occur.
- The presentation of psoriatic arthritis exhibits significant variation among individuals, characterized by an unpredictable course. Its severity spans from mild to severe, with potential for destructive outcomes.
- Beyond its impact on joints, psoriatic arthritis can give rise to extra-articular manifestations such as inflammatory eye conditions like uveitis and iritis, renal ailments, mitral valve anomalies, and aortic regurgitation.
- Urethral inflammation can also arise, and fatigue is a prominent challenge faced by those dealing with psoriatic arthritis.

Psoriatic arthritis intersects with various other diseases and conditions, including:

- Psoriasis
- Ankylosing spondylitis
- Systemic lupus erythematosus (SLE)
- Giant cell arteritis
- Sjögren's syndrome
- Crohn's disease

- Metabolic syndrome
- Atherosclerosis
- Coronary heart disease
- Depression
- Fatigue, anemia, and mood alterations
- Heightened risk of developing hypertension, elevated cholesterol, diabetes, and obesity

X. DIAGNOSTIC TESTS

When diagnosing psoriatic arthritis, various diagnostic tests and imaging techniques are utilized, including:

1. **HLA-B27 Detection:** Blood work is conducted to detect the presence of HLA-B27, a common histocompatibility complex marker associated with psoriatic arthritis.
2. **Complete Blood Count (CBC):** A CBC is performed to check for any abnormalities, such as a reduction in red blood cells, which can occur in psoriatic arthritis.
3. **X-rays:** X-rays can reveal erosive changes in the distal interphalangeal (DIP) joints, supporting the diagnosis of psoriatic arthritis.
4. **Ultrasound and MRI:** Both ultrasound and MRI have demonstrated high sensitivity in detecting early inflammatory joint changes in psoriatic arthritis.
5. **Contrast-Enhanced Ultrasound:** Contrast-enhanced ultrasound is increasingly utilized as it can detect changes in bone and soft tissue earlier than traditional x-rays.

XI. DIFFERENTIAL DIAGNOSIS

To differentiate psoriatic arthritis from other rheumatic conditions, additional blood tests can be performed:

1. **Rheumatoid Factor (RF) Test:** This blood test helps rule out rheumatoid arthritis, as RF is commonly present in individuals with rheumatoid arthritis but not typically in psoriatic arthritis.
2. **Anti-Nuclear Antibody (ANA) Test:** ANA test is used to rule out lupus (systemic lupus erythematosus) as it detects autoantibodies commonly found in lupus patients. Regarding the pathogenesis of psoriatic arthritis, it is recognized that inflammation can originate at the enthesitis (the site where tendons or ligaments attach to bone) and subsequently spread to adjacent structures, including bone, synovium, and other tissues. This is in contrast to rheumatoid arthritis, where inflammation is considered to start in the synovium (joint lining). The understanding of the distinct pathogenic mechanisms involved in psoriatic arthritis has contributed to the development of targeted therapies specific to this condition.

XII. TREATMENT PLAN

The treatment goals for psoriatic arthritis can be categorized into four main areas:

- 1. General Management:** This involves adopting lifestyle modifications and self-care practices to manage the symptoms and improve overall well-being. Strategies may include maintaining a healthy weight, engaging in regular exercise, managing stress levels, and avoiding triggers that worsen symptoms.
- 2. Topical Application:** Topical treatments are applied directly to the affected skin and joints to alleviate localized symptoms. This may include the use of corticosteroid creams, moisturizers, salicylic acid preparations, or calcipotriene (a form of vitamin D).
- 3. Systemic Application:** Systemic treatments are medications taken orally or through injection that target the underlying inflammatory processes and help manage the systemic symptoms of psoriatic arthritis. These may include nonsteroidal anti-inflammatory drugs (NSAIDs), disease-modifying antirheumatic drugs (DMARDs), such as methotrexate or sulfasalazine, or biologic agents, such as TNF inhibitors or IL-17 inhibitors.
- 4. Physiotherapy Management:** Physical therapy and rehabilitation play an important role in managing psoriatic arthritis by improving joint mobility, reducing pain, and increasing strength and function. This may involve exercises, stretches, and techniques to improve joint range of motion, as well as modalities such as heat or cold therapy.

The specific treatment approach will depend on the severity of symptoms, the extent of joint involvement, and individual factors such as overall health and preferences. It is important for individuals with psoriatic arthritis to work closely with their healthcare team to develop a comprehensive treatment plan that addresses their unique needs and goals.

General management strategies for psoriatic arthritis include:

- 1. Sympathetic and Considerate Approach:** It is important for healthcare providers to adopt a compassionate and understanding approach when dealing with patients with psoriatic arthritis. This helps in building trust and confidence, and reassures the patient that their condition is not contagious or disfiguring.
- 2. Addressing Anxiety and Worry:** Psoriatic arthritis can have a significant impact on a person's emotional well-being. Identifying any anxiety or worry related to the condition and providing appropriate support and guidance is important. Encouraging relaxation techniques or suggesting professional help, if needed, can be beneficial.
- 3. Education and Reassurance:** Providing information and education about psoriatic arthritis to the patient and their family can help alleviate concerns and misconceptions. Reassurance that the condition is manageable and not life-threatening is important for improving the patient's overall outlook.

- 4. Prompt Access to Specialists:** Establishing an open-door system where patients have quick access to dermatologists or physiotherapists when needed can help in managing flare-ups and addressing any concerns promptly. This ensures timely intervention and appropriate management of symptoms.
- 5. Dietary Considerations:** While there is no specific diet that has been proven to cure or treat psoriatic arthritis, some individuals may find that certain dietary changes, such as avoiding potential allergens or triggers, can help manage their symptoms. It is important to discuss dietary modifications with a healthcare professional or a registered dietitian to ensure a balanced and nutritious approach.

Topical applications for psoriatic arthritis can help manage localized symptoms and skin involvement. Here are some commonly used topical treatments:

- 1. Simple Bland Aqueous Cream:** A basic moisturizing cream can help hydrate the skin and reduce dryness and itching associated with psoriatic lesions. It is a gentle option for daily use.
- 2. Coal Tar Applications:** Coal tar preparations containing salicylic acid and zinc oxide can help reduce inflammation and scale buildup. These can be used alone or in combination with ultraviolet radiation (UVR) therapy as part of the Goeckerman regimen. This treatment is usually administered in a hospital setting and requires daily application and bathing.
- 3. Diathranol in Lassar's Paste:** Diathranol is a potent topical treatment that can be effective for resistant psoriasis. However, it should be used with caution as it can cause burns on normal skin. Monitoring for adverse effects such as blisters or skin discoloration is important. UVR therapy with the Theraktin may be combined with diathranol treatment.
- 4. Corticosteroid Creams:** Topical corticosteroids are commonly used for acute flare-ups and can provide initial relief. However, long-term use is generally discouraged due to potential side effects. They are particularly useful for sensitive areas like the face and hands due to increased absorption in these areas.

For mild disease, non-steroidal anti-inflammatory drugs (NSAIDs) and local corticosteroid injections may be used to alleviate pain and inflammation.

For moderate to severe psoriatic arthritis, disease-modifying anti-rheumatic drugs (DMARDs) are often prescribed to suppress disease activity and prevent joint damage. If patients do not respond adequately to NSAIDs or DMARDs, biologic medications targeting tumor necrosis factor (TNF) can be considered. These TNF inhibitors, such as adalimumab, etanercept, golimumab, and infliximab, are administered intravenously and help reduce inflammation by suppressing T-cells and TNF production.

Otezla is an oral phosphodiesterase-4 (PDE-4) inhibitor that has been approved for the treatment of psoriatic arthritis. By inhibiting PDE-4, Otezla reduces the production of

pro-inflammatory mediators and increases the levels of anti-inflammatory mediators in the body.

In systemic applications for psoriasis, several medications can be used to manage severe cases. It's important to note that these medications should only be used under the supervision and prescription of a healthcare professional, as they can have significant side effects and require careful monitoring.

Here are some examples:

- 1. Retinoids:** Retinoids, derived from vitamin A, can be effective in treating psoriasis. One specific retinoid called etretinate (marketed as Tigason) has shown improvement in psoriasis symptoms. However, it can cause side effects such as dryness and cracking of the mouth, hair loss (alopecia), and itching (pruritus). Importantly, etretinate is known to be teratogenic, meaning it can cause fetal malformations, and therefore should be avoided during pregnancy.
- 2. Methotrexate:** Methotrexate is a cytotoxic drug that can be used to treat severe psoriasis. It works by suppressing the immune system and reducing inflammation. However, it can have potential risks and side effects, including damage to bone marrow, intestines, and liver tissues. Regular monitoring of blood counts and liver function is necessary during treatment with methotrexate.
- 3. Cyclosporine:** Cyclosporine is an immunosuppressive medication that can be effective in treating severe psoriasis. It works by inhibiting the immune response and reducing inflammation. Cyclosporine is generally reserved for short-term use due to its potential side effects, including high blood pressure, kidney damage, and an increased risk of infections. Regular monitoring of blood pressure and kidney function is required during treatment.

XIII. PHYSIOTHERAPY MANAGEMENT FOR PSORIASIS AND PSORIATIC ARTHRITIS

- 1. Ultraviolet Radiation (UVR) Therapy:** UVR therapy, including UVB and PUVA, can be effective in treating psoriasis. The Theraktin and PUVA are two sources of UVR used in the treatment:
 - **The Theraktin:** This therapy involves using a tunnel with four fluorescent tubes emitting UVB radiation. The patient lies supine and prone during the treatment session to expose the entire body. UVB treatment may be used alone or in conjunction with coal tar or diathranol. Treatment frequency and duration are adjusted based on the patient's response and the progression of healing.
 - **PUVA:** PUVA stands for psoralen plus UVA therapy. It involves the use of a photosensitizing substance called psoralen, which is taken orally, followed by exposure to UVA radiation. This treatment is used for resistant cases of psoriasis. Precautions must be taken, such as wearing protective goggles and avoiding sunlight for a specified period after treatment.

PATIENT'S WEIGHT (Kg)	DOSE(mg)
30	10
30-50	20
51-65	30
66-80	40
81-90	50
90 and over	60

Calculated according to skin type in joules (Table X.2). There is little erythema with UVA; therefore the skin type chart has to be used. (To produce an erythema with UVA requires a dosage 1000 times greater than UVB).

Table X.2 UVA dosage in PUVA treatment

Skin Type	Start(J)	Inncrease(J)
I. Always burn, never tan	½	½
II. Always, then slight tan	½	½
III. Sometimes burn, always tan	1	1
IV. Never burn, always tan	1	1
V. Lightly pigmented	1 ½	1 ½
VI. black	1 ½	1 ½

The dosage is recorded in joules/cm². An exposure meter is used to test the output and measures milliwatts/cm²; 1mW/cm²=1/1000 joules/second

2. **Ultraviolet Radiation (UVR) Therapy:** UVR therapy, such as UVB and PUVA, can be beneficial for treating psoriasis. UVB therapy is administered using a device called the Theraktin, which emits UVB radiation. The treatment is typically given in a tunnel-like setup with fluorescent tubes. PUVA therapy involves the use of a photosensitizing substance called psoralen, followed by exposure to UVA radiation. PUVA therapy is usually conducted in a cabinet with UVA-emitting fluorescent tubes. These therapies are typically administered in a controlled manner, with gradual increases in exposure time and dosage.

3. **Duration and Frequency of Treatment:** The duration and frequency of UVR therapy depend on various factors, including the patient's skin type and response to treatment. The initial treatment duration may range from 5 minutes for skin types I and II to 6 minutes for skin types V and VI. The duration can be gradually increased, usually by 1-3 minutes per session. The total joules count is monitored to ensure safety and to minimize the risk of complications. Initially, patients may attend therapy three times a week, and as healing progresses, the frequency is gradually reduced to twice weekly, once weekly, once per fortnight, or monthly "holding sessions."

4. Precautions and Advice for PUVA Therapy: During PUVA therapy, certain precautions should be followed:

- Psoralen should not be taken on an empty stomach.
- Protective goggles that screen 90% of UVA should be worn during exposure to prevent cataract formation.
- Sunglasses should be worn for at least 24 hours after taking psoralen, even indoors.
- Skin should be covered and a hat worn in bright sunlight for 24 hours after treatment.
- Ointments should be discontinued during PUVA therapy.
- Contraceptive measures are essential, as PUVA treatment can have adverse effects on pregnancy.
- Regular checkups are necessary after completing treatment.
- Patients should report any feelings of faintness during treatment to the physiotherapist immediately.

5. Mechanism of Action: PUVA therapy works by binding psoralen to DNA, which is then activated by UVA radiation. This binding leads to cross-linking of DNA thymine bases, inhibiting the epithelial synthesis and cell division. As a result, the excessive reproduction of the epidermis in psoriasis is reduced, leading to the improvement of symptoms.

6. Long-term Management: The duration of treatment for psoriasis varies, but it may take up to 10 weeks to clear the skin. Afterward, maintenance doses may be given for 4-6 weeks, depending on the individual's response. Regular 2-6 monthly reviews are necessary to monitor the condition. Once discharged, patients should have access to treatment as soon as a recurrence occurs.

XIV. PHYSICAL ACTIVITIES FOR PSORIASIS

These activities can help to manage weight and may help control psoriasis:

1. Walking



- Ride a stationary bike

2. Swim to make the heart stronger and to burn calories.



- Aerobics if walking is painful because of cracking skin, try swimming or water.
- Weight training builds muscle and boosts the metabolism



- Resistance exercises with the help of thera bands.
- Lift free weights, use weight machines.



- **Do Pushups and Squats.**



- **Influence of physical exercise on melatonin levels:** Physical activity has the potential to promptly influence melatonin levels. The majority of research indicates that melatonin levels in the bloodstream experience a brief and passing surge following exercise. This immediate reaction of melatonin release due to exercise might be influenced by the body's internal clock at the time of physical activity. The rapid elevation of melatonin in circulation subsequent to exercise is diminished with consistent and intense training. Intense physical exertion leads to the creation of oxidative stress, and melatonin acts as a robust antioxidant with the ability to shield against potential molecular harm.

XV. THERAPEUTIC EXERCISES FOR PSORIATIC ARTHRITIS

Therapeutic exercises are tailored activities that cater to individual requirements. They are strategically developed to achieve specific objectives, such as enhancing muscle strength. These exercises can be categorized into two types for addressing arthritis: range of motion and strengthening exercises.

Range of motion exercises serve the purpose of preserving joint mobility, alleviating stiffness, and reinstating flexibility. To uphold or enhance joint and muscle flexibility, it is

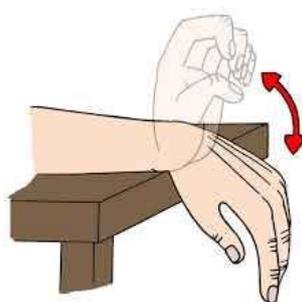
necessary to push these components to their limits. Regular engagement in range of motion exercises is recommended.

Strengthening exercises contribute to the maintenance or augmentation of muscle strength. Strengthening a muscle involves applying resistance during movement. This resistance can be sourced from your own body weight, weights, or resistance bands. It is advisable to perform strengthening exercises on alternate days, avoiding times when a joint is inflamed and painful (exhibiting warmth upon touch), unless supervised by a physiotherapist.

The subsequent exercises are provided as initial examples to facilitate your start. For a customized regimen tailored to your specific requirements, it is recommended to consult a healthcare professional.

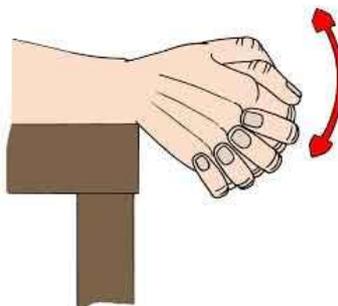
Finger and Hand Exercises: Place your forearm on a table for support, with your hand comfortably draping over the edge. Proceed to straighten your wrist while making a fist; subsequently, release the clench and allow your hand to relax.

1. Repeat ten times.



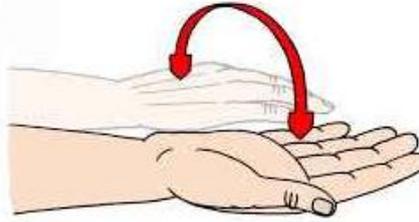
Interlock your hands and rest your forearms on a table, ensuring your hands extend beyond the table's edge. Proceed to flex and extend your wrist in an up-and-down motion.

2. Repeat five times.



Rest your forearm on a table while keeping your elbow close to your side and your palm facing downward. Sequentially, rotate your palm to a facing upward position and then return it to facing downward, all the while maintaining the immobility of your elbow.

3. Repeat ten times.



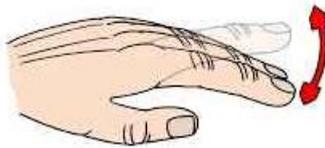
Position your elbow on a table with your hand facing upwards. Begin by extending your fingers fully, and then proceed to flex them, aiming to bring your fingertips into contact with the base of your fingers.

4. Repeat ten times.



Rest your palm on a table surface. Elevate each finger independently from the table's surface.

5. Repeat five times



Place your elbow on a table, keeping your hand in an upward position. Proceed to touch the tip of your thumb to the tip of your little finger, and then replicate this action with your other fingers in a sequential manner.

6. Repeat five times.



7. Neck and back: For the initial three exercises, maintain an upright posture in a chair with adequate back support. Gently incline your head toward one shoulder until you sense a stretch on the opposite side. Maintain this position for around five seconds.

8. Repeat to the other side.



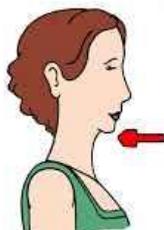
Rotate your head to one side until you perceive the stretch. Sustain this position for roughly five seconds. Replicate the movement for the opposite side.

9. Repeat five times to each side.



Retract your chin while maintaining the alignment of your neck and back, avoiding any forward inclination of your head. Hold this concluding stance, sensing the stretch in your neck.

10. Repeat five times.



Recline on your back, placing your hands atop your stomach, while bending your legs at the knees and ensuring your feet rest flat on the bed or floor. Engage your abdominal muscles to flatten your lower back against the surface.

11. Hold for five seconds, repeat ten times.



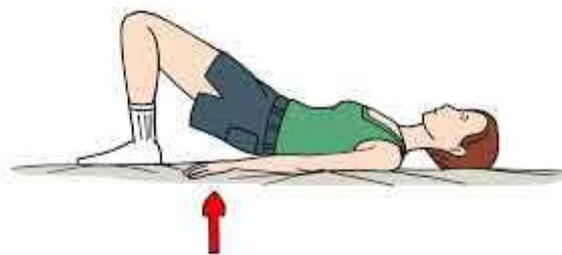
While maintaining your shoulders in a flat and lowered position, gradually rotate your knees from one side to the other.

12. Hold for five seconds, repeat ten times.



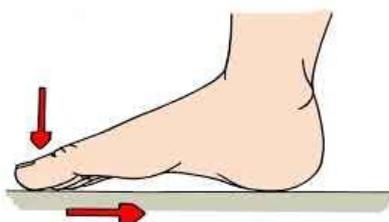
Exert pressure on your heels to elevate your buttocks and lower back away from the bed.

13. Hold for five seconds, repeat ten times.



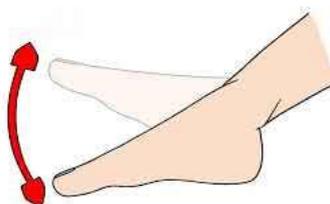
14. Feet and toes: Apply downward pressure to your toes while contracting the arch on the inside of your foot, causing your foot to shorten.

15. Repeat on the other foot.



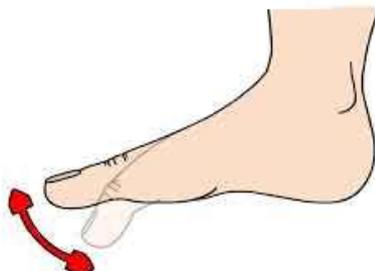
Lie with your legs out straight and pull your feet up, then push your feet down.

16. Repeat ten times.



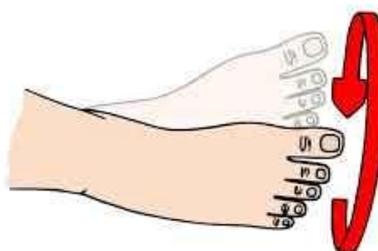
Gently move your toes.

17. Repeat ten times.



Rotate your feet in a circular motion first in one direction, and then in the opposite direction.

18. Repeat ten times.



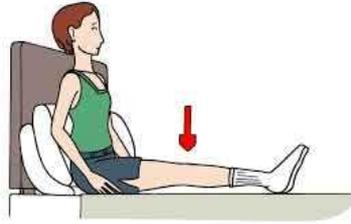
19. Hips and knees: Lie facing downwards with both legs fully extended for a duration of five minutes. Subsequently, softly flex each knee to its maximum, then unwind and return your legs to a straight position.

20. Repeat five times with a 30-second break.



Position yourself seated on a sturdy bed, extending your legs in front of you. Press down on each knee, aiming to elongate it fully against the bed's surface. Maintain this posture for five seconds before releasing and relaxing.

21. Repeat five times.



Recline on your back, bending your knees and placing your feet flat on the bed. Lift each knee towards your stomach one at a time, then extend and gently lower it back to the bed.

22. Repeat five times.



23. Jaw: Softly widen your mouth to its maximum extent, experiencing a gentle stretch, and maintain this position for a duration of five seconds. Subsequently, shut your mouth entirely.

24. Repeat five times.



XVI. RECREATIONAL EXERCISE

Engaging in recreational exercise holds a significant role in upholding overall health and well-being. It encompasses activities that rejuvenate both the body and mind, fostering enhanced fitness levels, expanded joint range of motion, and bolstered muscle strength. While recreational exercise should not serve as a replacement for therapeutic programs, it can serve as a complementary addition.

Below are examples of recreational exercises tailored to individuals with psoriasis or arthritis:

1. **Swimming:** Swimming presents a comprehensive exercise option that places minimal stress on the joints. Pool water's chlorine typically doesn't adversely affect psoriasis, but if dryness and itchiness arise, applying a protective cream before swimming and showering afterward can alleviate discomfort.
2. **Walking:** Walking stands as another excellent exercise avenue. For those with arthritis affecting their feet, well-fitted shoes are vital, and prescribed insoles can provide added support.
3. **Cycling:** Cycling offers a suitable alternative to walking, providing a more comfortable choice for individuals with foot-related concerns
4. **Yoga, Pilates, and Complementary Therapies:** Practices like yoga, Pilates, and other complementary therapies extend benefits to individuals with arthritis. These activities can enhance joint flexibility and stress relief. For information on classes or events, consulting local council offices or community centers is advisable.

The advantages of exercise for psoriasis and arthritis patients encompass:

1. **Strengthened Immune System:** Regular exercise contributes to a robust immune system, pivotal in managing psoriasis, an autoimmune disorder.
2. **Weight Management:** Psoriasis patients often face a higher likelihood of being overweight, increasing susceptibility to other health issues. Consistent exercise and a wholesome diet aid in weight control, mitigating risks.
3. **Enhanced Treatment Effectiveness:** Overweight patients might experience diminished treatment effectiveness for psoriasis. Maintaining a healthy weight through exercise amplifies the efficacy of treatments.
4. **Alleviation of Psoriatic Arthritis Symptoms:** For managing psoriatic arthritis, regular exercise is paramount. It diminishes pain, stiffness, and joint deformities, while enhancing overall mobility.
5. **Stress Relief:** The stress associated with psoriasis can be substantial. Exercise prompts the production of endorphins, natural mood enhancers, countering stress hormones. Regular exercise extends mental benefits, aiding individuals in coping with the challenges tied to psoriasis.

Despite concerns regarding condition exacerbation or joint discomfort, entirely avoiding exercise is inadvisable. Rather, it's recommended to take precautions, such as using ice packs for inflammation reduction, massaging swollen regions, following prescribed splint usage from healthcare professionals, and applying appropriate heat therapy. Additionally, a TENS machine, delivering low-voltage currents to areas of pain, can be beneficial for pain management.

XVII. SUMMARY

1. Opt for a consistent regimen of low-impact exercises.
2. Embrace the concept of small, frequent exercise sessions, particularly for addressing muscle weakness.
3. Introduce variety in your exercises to prevent monotony.
4. Approach stiffness gently, refraining from exerting excessive pressure on your joints.
5. Acknowledge occasional setbacks as part of the process.
6. Eliminate excuses – engaging in regular, gentle activities empowers you, fostering mobility and fitness.

XVIII. STRETCHES

1. **Neck Roll:** Sit upright in a chair with support for your lower back. Gently tilt your head, bringing your right ear toward your right shoulder, feeling a stretch along the left side of your neck. Hold this position for 2 seconds and then return to the center slowly. Repeat this movement five times on each side, both to the right and to the left.
2. **Knee-to-Chest Stretch:** Lie on your back with your knees bent and feet flat on the ground. Gradually draw your right knee toward your chest, using gentle pressure from your hands. Experience the stretch in your hip and the back of your leg. Release the stretch gradually and switch to the other leg. This stretch can also be performed while standing in a pool, utilizing the opposite hand on the pool's edge for balance.
3. **Knee-Leg Extension:** Position yourself in a chair with proper back and thigh support, ensuring your feet rest flat on the ground. Slowly lift and extend your right lower leg, creating a straight line from hip to toe. Elevate and lower the leg within a 2-second count. Repeat this movement 20 times for the right leg, and then repeat with the left leg.
4. **Arch Stretch:** Keep your right foot grounded and press your toes downward, attempting to lift your arch. Raise and lower the arch gradually over a 2-second span. Repeat this motion up to 20 times for each foot. This stretch can offer relief for foot discomfort stemming from psoriatic arthritis.
5. **Ankle Rotation:** While seated, flex your foot and trace small circles with your big toe. Perform 5 clockwise circles and 5 counter-clockwise circles. Repeat this process with the opposite foot. Gently flex and point your toes to provide them with a slight stretch.
6. **Open-Closed Hand Stretch:** Allow your elbow to rest on a table and elevate your lower arm to a 90-degree angle, forming a fist. Open your fingers for a count of two, then gradually close them back into a fist. Perform this sequence 20 times for each hand, which can help prevent hand stiffness.
7. **Finger Lift:** Position your forearm on a table with your palm facing downward and fingers extended. Gradually elevate and lower each finger. Allocate 2 counts to raise and lower each finger. Repeat this action with your other hand.

- 8. Thumb-Finger Touch:** Slowly endeavour to touch the tip of each fingertip to the tip of your thumb, sequentially moving from your index finger to your pinky and back. Refrain from forcing painful movements, but aim to increase proximity with each attempt. This practice enhances hand flexibility and strength.

Stretching exercises contribute to improved flexibility without exacerbating joint discomfort. They enhance blood flow to muscles, focusing on localized muscle action instead of joint stress. The key lies in identifying stretches that facilitate your daily activities. It's vital to approach stretching gently, avoiding pain, and maintaining stretches for durations of 6 to 10 seconds.