



## Nail Disorders: An Updated Review

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### ABSTRACT

Healthy nails look smooth and have a uniform color. As people grow older, they may have vertical bumps, or their nails may become a little brittle, but this is harmless. Injury-related stains should expand with the fingernail. Abnormalities such as stains, discoloration, and nail peeling can be occurred by finger and hand injuries, viral warts, nail fungal disease, and several medications such as chemotherapeutic agents. Some other medical conditions can also change the physical appearance of fingernails. However, these differences can be hard to explain. The appearance of the nails alone is not enough to diagnose a particular illness. Doctors use this information in conjunction with other symptoms and physical examinations to make a diagnosis. Some changes to the nails can be due to a medical condition that requires attention. There can be several symptoms like changes in color, thickness, and shape of nails, brittle nails, hollow nails, bleeding around the nails, swelling and redness around the nail, pain around the nails, exfoliation of the fingernail from the skin. These changes in nails can be occurred due to several conditions. This review concentrates on each and every physical change observed in nails, physiological changes in body due to which these disorders occur and prevention to some common disorders.

**Keywords:** Nail Plate, Matrix, Discoloration, Exfoliation, Keratinous, Translucent, Nail bed.

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### INTRODUCTION

Nails and claws of mammals are specialized epidermal derivatives which protect the delicate tip of fingers and toes against trauma and act as tools or weapons. Human fingernail gross anatomy consists of three structures. Starting from the outer structure, they are the nail plate, the nail bed, and the nail matrix.<sup>1</sup> The nail apparatus serves as a protective layer over the dorsal aspect of each distal phalanx of both hands and feet. The nail matrix's permanent product is the nail. The integrity of various components, including the surrounding tissues and the bony phalanx that contribute to the nail apparatus, is critical to its correct appearance and growth.<sup>2</sup> Other roles include defence or assault mechanisms, scratching, and cosmetic goals, in addition to protection. This review focuses on various nail disorders occur due to physiological changes in the body.<sup>3</sup>

#### Anatomy of Nail

In human and other primate anatomy, a nail is an erotic plate that appears to be growing on the back of each finger and toe at its distal end. It is analogous to a vertebrate's

claw, hoof, or talon.<sup>4</sup> The nail is a keratinous, translucent plate made up of highly specialised epithelial cells. The nail rises from a deep slot in the skin's dermis. All nail growth takes place at the base of the nail, where the specialised cells that make up the nail plate are developed; these cells are pressured forward as new cells from underneath them.<sup>5</sup> The nail plate is also connected to the underlying, densely vascularized nail bed, which supplies nutrients to the plate. As the cells at the front side of the nail plate lose touch with the nail bed, they end up dying and turn white. The lunula, a whitish crescent-moon-shaped part of the nail, is also not tethered to the foundational nail bed.<sup>6</sup> The primary function of the nail is to protect the tips of the toes and fingers. The front edge of the nail on the finger aids in the tampering of tiny objects as well as scratching. The nail has numerous soft tissue structures that help sustain and form the tough outer nail plate.<sup>7</sup> The nail plate is surrounded by four structures: the nail matrix, the nail bed, the parietal nail fold, and the hyponychium. The nail plate is a tough, mildly curved, translucent, rectangular structure that embraces the distal part of the digits' lateral aspects and can extend past their free edge. The nail plate is a thin (0.25-0.6 mm for fingernails and up to 1.3 mm for toenails), tight, yet slightly stretchy, translucent, convex structure composed of approximately 25 layers of dead, flattened keratinized cells. They are linked together by numerous intercellular links, membrane-coating granules, and desmosomes, which are cell structures that specialise in cell-to-cell adhesion and are usually arranged on the outer edges of plasma membranes.<sup>8</sup> The fingernail has three layers (from outer to inner): dorsal, intermediate,



and ventral, with a width ratio of approximately 3:5:2. The dorsal outer layer is intense and hard, made up of cornified keratin that is only a few cells thick (about 200).<sup>9</sup> The cells on the plate's dorsal surface overlap and form a smooth surface. In comparison to the dorsal layer, the intermediate layer has a highly fibrous structure that is focused perpendicularly of nail growth and accounts for roughly 75% of the plate's thickness.<sup>10</sup> Keratin fibres are considered to be maintained together through globular, cysteine-rich proteins that act as glue via disulphide bonds. The middle layer is thought to be the softest and thickest. The ventral layer is very thin and is made up of a few layers of cells that attach the nail plate to the nail bed beneath.<sup>11</sup> Individuals' nail growth rates vary greatly, with average values of 3 mm per month for fingernails and 1 mm per month+ for toenails. A normal fingernail takes about 6 months to grow out entirely, whereas a toenail takes about 10 - 12 months.<sup>12</sup>

## Structure and function

### 1. The nail matrix

The nail matrix is embedded primarily within the nail fold and plate. About midway between the distal interphalangeal joint and the adjacent nail fold, the proximal nail matrix begins. The lunula, a white half-moon structure recognisable through the nail plate, is the distal nail matrix. The nail matrix seems to be the only part of the nail entity that contains melanocytes and is essential for the onset of the hard nail plate.<sup>13</sup> Onychocytes, or nail cells, are pressured peripherally and proximally to form the nail plate. Different portions of the nail plate are formed by different components of the nail matrix. In general, the anterior nail matrix forms the dorsal nail plate, while the distal nail matrix forms the ventral nail plate. However, the anterior nail matrix accounts for 80 percent of the nail plate. As a result, a biopsy or surgical procedure on the proximal nail matrix will cause little harm to the nail plate.<sup>14</sup>

### 2. Nail Folds

The nail folds are soft tissue frameworks that safeguard the nail plate's horizontal and adjacent edges. The anterior nail fold shields the majority of the nail matrix from trauma and UV rays.<sup>15</sup>

### 3. Nail bed

The nail bed is connected to the posterior edge of the nail plate and extends from the lunula to the hyponychium. Longitudinal epidermal ridges connect the nail plate to the nail bed. These grooves on the frontal nail plate surface work in tandem with the ridges on the nail bed to increase the surface area of the nail plate's adherence to the inherent nail bed, thereby improving bond strength between these two surfaces.<sup>16</sup> When the keratins essential for the formation of this layer of the epidermis are not present, the nail bed does not produce a stratum corneum. However, if the nail plate is lost due to onycholysis, the nail bed ends up losing the translational ridges and commences

to express the keratins required to create the stratum corneum.<sup>17</sup> A thin layer of collagenous dermis abides to the periosteum of the fundamental distal phalanx beneath the nail bed. In the setting of a nail infection, a lack of fatty tissue can raise the risk of osteomyelitis of the distal phalanx.<sup>18</sup>

### 4. Mantle

The mantle is the skin that covers the nail plate's matrix and base.<sup>19</sup>

### 5. Hyponychium

The hyponychium is the area just below the periphery of the nail plate and proximal to the nail bed.<sup>20</sup>

### 6. Onychodermal band

The onychodermal band is a component of the proximal nail bed that is prominently displayed in a contrasting colour. It serves as the first line of defence on the periphery of the nail, similar to the cuticle. Changes in colour can indicate different ailments or discrepancies in vascular system.<sup>21</sup>

### 7. Cuticle

The cuticle (or eponychium) develops from the anterior nail bed and abides to the nail plate. The proximal nail fold and cuticle work together to form a defensive seal against any allergens that may destroy the matrix beneath.<sup>22</sup>

## Nails and health

Did you know that your nails can tell you about your overall health? The health or disease condition of the body is regularly alluded to as a doorway through the nails. They vary in shape and size because of systemic issues that interrupt with their natural growth. A tiny piece of white here, a rosy smidgeon there, or cascading or clots in the skin could all be symptoms of illness. Concerns with your liver, lungs, or heart can be revealed by your nails. Continue reading to discover what mysteries the nails may conceal.<sup>23</sup>

### Aldrich-Mees Lines

The Aldrich-Mees line is a white crosshair. It could be an indication of arsenic poisoning.<sup>24</sup>

### Pitting

Pitting refers to small pits in the nails. It is common in people with psoriasis, a state of the skin that makes it dry, red, and inflamed. Some intrinsic disorders can also lead to pitting.<sup>25</sup>

### Clubbing

When clubbing, nails thicken and bend around fingertips. It is a process that typically takes years. It may be due to a lack of oxygen in the blood. It is concerned with cardiovascular disease, inflammatory bowel disease, liver disease, lung disease, and AIDS.<sup>26</sup>



### Leukonychia

The uneven white spots and lines on the nails are called leukonychia. These may be due to mild trauma but are harmless to healthy people. From time to time, leukemia is by poor health and undernourishment. Factors can be infections, metabolic disorders, systemic disorders, and certain drugs.<sup>27</sup>

### Beau Lines

The indentation that crosses the nail is called the Beau line. It can be a symptom of malnutrition. Other conditions that cause this disease are measles, mumps, high body temperature, scarlet fever, peripheral vascular disease, pneumonia, diabetes, and a crunch of zinc.<sup>28</sup>

### Koilonychia

Koilonychia is concerned with the shape of the nails. The nails begin to bend like a spoon. The possible causes are malnutrition and autoimmune disorders. Sometimes the fingernail is bent enough to clinch a drop of fluid.<sup>29</sup>

### Onycholysis

When the nail plate moves away from the nail bed, a white discoloration occurs called onycholysis. It can be due to septicaemia, an abrasion, or products used on the nail, like nail paints. Some other causes of onycholysis are psoriasis and thyroid disease.<sup>30</sup>

### Yellow Nail Syndrome

In yellow nail syndrome, the nails become thicker and do not grow as fast as usual. Sometimes the fingernails do not have cuticles and even move away from the nail bed. The causes may be internal malignant tumor lymphedema, swelling of the hands, pleural effusion, fluid retention between the lungs and chest, respiratory diseases, and rheumatoid arthritis.<sup>31</sup>

### Terry Nails

If there is a dark band on the tip of each nail, it is called a terry nail. It is because of aging, but it can be the consequence of congestive heart failure, diabetes, and liver disease.<sup>32</sup>

### Ridges in Fingernails

The fingernail is the arrangement of the living skin cells of the finger. Skin conditions, such as eczema, can lead to bulging nails. Dry skin can also cause these bumps. If your body is deficient in protein, calcium, zinc, or vitamin A, nail ridges can reveal the deficiency. These ridges can be horizontal and vertical.<sup>33</sup>

### Black Lines on the Nails

The thin black lines that form vertically under the nail are known as splinter haemorrhage. It can be occurred for various reasons and can be harmless or a sign of a severe health condition. This condition is bleeding of debris because it can look like detritus under the nails. This

condition is due to damage to the small blood vessels under the nails.<sup>34</sup>

### Periungual warts

These warts form around the fingernail or toenail. They start small, about the size of the head of a pin, and slowly grow into rough, dirty-looking ridges that appear to be like cauliflower. Eventually, they spread to the cluster. Warts around the nails often affect children and young adults, especially if they bite the nails. These warts are difficult to treat, but they can help start treatment as soon as one finds them.<sup>35</sup>

### Peeling Nails

Today, fingernails are for cosmetic purposes, but their primitive uses include digging and protection. Nails also protect your fingertips and improve your ability to pick up objects. Fingernail is composed of keratin, a protein that is also present in hair. The fingernail has several layers that can come off. It can cause them to become thinner or weaker and split. The medical term for nail detachment is onychoschizia.<sup>36</sup> Nail peeling can be the result of a nail injury. In rare cases, it may indicate a general condition or a sign that a pathological process is occurring in the body. It takes six months for the nails to grow fully. It means that an event that happened a few months ago can cause nail abnormalities. There is a risk of developing nail diseases in people with several characteristics like genetic predisposition, excessive exposure to water, heat, moisture, tight shoes, chemical damage, diabetes, skin diseases, tumor, manicure, acne, soil contamination, and AIDS.<sup>37</sup>

### Dystrophic Nails (Self-induced)

Frequent exploitation of the nail plate (e.g., manicures/pedicures, biting, rubbing) can result in dystrophic nail. Repetitive longitudinal scraping or exploitation can cause cuticle and nail plate adjustments, such as the cuticle pushing back, dividing or indentation in the center line of the nail (median nail dystrophy), or swelling or hypertrophy of the anterior nail fold.<sup>38</sup>

### Eggshell nails

Are markedly thin, white nail plates that are more versatile, weaker, and can heal over the free edge, and are generally caused by poor diet, genetic predispositions, intrinsic disease, or pharmacotherapy. When manicuring these nails, use extreme caution because they are fragile and easily break. If necessary, file them gently with the delicate side of an abrasive (240 grit or higher) board.<sup>39</sup>

### Hangnails/Ag nail

The living skin around the nail plate rifts in this condition. Hangnails are caused by dryness or small cuts. Hot oil manicures will help to improve the ailment. Also, don't ever trim the living skin around the innate nail plate, no matter how dry and rough it appears. Infection symptoms include redness, pain, swelling, or pus that hurts.<sup>40</sup>



### Melanonychia

It is the pigmentation of one's fingernails or toes. It appears as a black band inside the nail plate, spreading from the free edge's base. Melanin, which is used to colour hair.<sup>41</sup>

### Onychophagy

Bite nails are caused by a habit of chomping the nail or the hard core, damaged skin around the nail plate. Inform clients that regular manicures and treatment of the hardened eponychium sometimes can help them overcome this habit, beautifying deformed nails and discouraging the client from biting the nails. A cosmetologist should not be consulted.<sup>42</sup>

### Onychorrhexis

Split or brittle nails with a sequence of lengthwise striations giving the texture of the nail plate a rough appearance, probably triggered by matrix injury, excessive use of cuticle removers, harsh cleaning agents, combative filling methods, or hereditary factors. Softening the nails with a conditioning treatment resolved the problem.<sup>43</sup>

### Nail pterygium-gym

Is an unusual condition caused by the nail plate by stretching the skin. This disorder is typically caused by severe injury, such as burns, or by an allergic reaction to synthetic nail enhancement products. It is unnatural and is exacerbated by harm to the eponychium (the congealed layer of skin at the base of the finger/toe nails) or hyponychium (skin just under the free edge of your nail).<sup>44</sup>

### Plicatured nails

Folded nails are a type of highly curved nail plate that is usually caused by matrix injury, but it can also be inherited. This condition frequently results in ingrown nails.<sup>45</sup>

### Splinter haemorrhages

Physical trauma or harm to the nail bed damages the capillaries and allows small amounts of blood flow. These are linked to the same type of hard impact or other physical trauma to the finger/toe.<sup>46</sup>

### Pseudomonas aeruginosa

A typical bacterial infection on the nail plate can be identified in its initial stages as a yellow green spot that darkens as it progresses. Staphylococcus aureus is one of several prevalent bacteria that causes a nail infection.<sup>47</sup>

### Onychia

It is caused by an inflammatory response of the nail matrix, which is followed by the thinning of the natural nail plate. If an unintended injury occurs, improperly sanitised nail equipments cause this and other diseases.<sup>48</sup>

### Nail psoriasis

It is a non-infectious issue that impacts the texture of the natural nail plate, resulting in tiny pits or severe roughness.

It can also influence the nail bed, causing yellowish to reddish spots beneath the nail plates known as salmon patches. Psoriasis is a chronic and recurring inflammatory skin disease that affects 1 to 3% of the world's population.<sup>49</sup> However, there is a scarcity of data on the epidemiological studies of this condition. The disorder is linked to immune dysfunction, and its highly complex aetiology includes interaction between genetic and environmental factors. Its clinical manifestations range from mild, localised lesions to severe erythroderma.<sup>50</sup>

### Onychocryptosis

Ingrown nails, also known as calloused nails, can affect either the finger or the toe. Nail tends to grow into the loops of living tissues around the nails in the condition. Walking movements can push the soft tissues up against the nail plate, exacerbating the problem.<sup>51</sup>

### Onychomadesis

It is the detachment of a nail plate from its nail bed. In most cases, the cause can be traced all the way back to a localised infection, matrix injuries, or a severe systemic illness. A major medical treatment, such as chemotherapy, could also be the culprit.<sup>52</sup>

### Paronchia/Around

It is caused by a bacterial infection of the tissues that surround the nail. In the skin fold located close to the nail plate, redness, pus, and inflammation are common. Individuals working with their hands in water, such as dishwashers and bartenders, are more vulnerable because their hands are frequently very dry or sore from inordinate water exposure, cleaning products, and harsh soaps.<sup>53</sup>

### Pyogenic granuloma (granola-lumpy)

It's an extreme nail inflammation in which a bulge of red tissue grows from the nail bed to the nail plate.<sup>54</sup>

### Onychomycosis

It is caused by a fungus in the natural nail plate. The texture of the nail has whitish fragments that can be skimmed away. Within the nail plate, there are long whitish or plate yellowish specks. The free border of the nail can deteriorate and impact the overall plate; often, the free edge of the nail invades the matrix and spreads.<sup>55</sup>

### Tinea pedis (Athlete's foot)

Is the scientific term for fungal skin conditions of the feet, which can occur on the bottom of the feet and often seem as a red erythematous rash between the toes, most commonly between the fourth and fifth. OTC anti - fungal substances can help maintain feet dry and heal faster.<sup>56</sup>

### Common nail disorders occur due to physiological changes in the body

#### Splitting, peeling, or brittle nails

These are prevalent issues that arise when hands are often exposed to moisture, harsh soaps, and other





chemical products. One may be able to evade some of these issues by using moisturising and avoid immersing hands in water multiple times.<sup>57</sup>

### **Cracked or split nails**

Thyroid disease has been linked to dry and fragile nails that break or split quite often. A fungal disease is more likely to cause crack formation or splitting with a yellowish ombre.<sup>58</sup>

### **Gnawed nail**

Biting one's nails seems like nothing more than an old habit, but it can also be a sign of chronic anxiety, which can be treated. Obsessive-compulsive disorder has also been related to nail biting or pulling.<sup>59</sup>

### **Nail disorders due to colour changes**

#### **Pale nails**

Pale nails can be a sign of severe illness, such as anaemia, heart problems, liver damage, or malnourishment.<sup>60</sup>

#### **Yellow nails**

A fungal infection is among the most frequent cause of yellow nails. The nail bed may pull back as the infection becomes worse, and the nails may firm up and eventually collapse. Yellow nails may cause severe health condition such as thyroid issues, respiratory illness, metabolic syndrome, or skin problems in rare circumstances. "Yellow nail syndrome" is marked by slower nail growth and a slathered or stretched appearance. Extravagant curvature seems to appear on the lateral surface of the nail plate, the lunula (the white half-moon at the anterior edge of the nail bed) vanishes, and the nail turns yellow.<sup>61</sup>

#### **Bluish nails**

Blue nails can indicate that the body isn't getting enough oxygen. This could be an indication of a lung concern such as emphysema. Some heart conditions are also associated with bluish nails. Hypothermia, congestive heart failure, peripheral vascular disease, and cold stress are all conditions that cause a decrease in blood flow to the extremities.<sup>62</sup>

#### **Black Nails**

Subungual melanoma or nevus, as well as a side effect of certain medications such as psoralens, phenytoin, sulphonamides, and antimalarial drugs. Malnourishment, thyroid issues, smoking, and hemochromatosis are among the other scenarios.<sup>63</sup>

#### **White nails**

If nails are often white with darkened rims, it could be a sign of a liver problem, such as hepatitis.<sup>64</sup> Variations of White Nails involve:

Mees lines are constricted white lines that run diagonally across the nails and are caused by arsenic poisoning. They can be singular or plural. They continue to blanch. Other than arsenic toxicity, they can be caused by antimony

poisoning, Hodgkin's disease, mycobacterial ailments, herpes zoster, and kidney failure.<sup>65</sup>

Muehrcke's lines are characterised by a double white diagonal line that shows up in hypoalbuminemic states when serum albumin levels fall below 2g/dL and disappears when they return to normal. As a result, they can be seen in kidney conditions like nephrotic syndrome or glomerulonephritis, as well as liver function disease and undernourishment. Chemotherapy may also cause it.<sup>66</sup>

Lindsay's nails (half and half nail) indicate leukonychia. The proximal half of the nail is normally pink, but the distal half is brownish. It is only used to treat uremic kidney failure.<sup>67</sup>

Terry's nails, which have been linked to congestive heart failure, liver failure, and peripheral vascular disease. Other circumstances include undernourishment, thyroid issues, adult-onset diabetes, haemodialysis, HIV, and peripheral vascular disease.<sup>68</sup>

### **Nail disorders due to separation from nail bed**

If your nail becomes detached from its nail bed for any reason, it will not re-join. Nails regrow slowly. Fingernails take about 6 months and toenails can take up to 18 months to grow back connected to the nail bed.<sup>69</sup>

### **Splinter haemorrhage and Janeway's lesions**

Splinter aneurysms are red or brown translational thin lines that occur beneath the nail plate. When capillaries inside the epidermal groove spill, they become visible. While splinter haemorrhages can be caused by benign conditions such as local trauma, psoriasis, or a localised fungal infection, they are a common finding in endocarditis patients.<sup>70</sup>

### **Dermatomyositis**

Tangled and distended capillaries just anterior to the integument give the eponychium's skin a blush and may indicate systemic lupus erythematosus, dermatomyositis, or scleroderma. Dermatomyositis is diagnosed by the blush and the pathognomonic discovering of Gottron's papules (thickened surface over the interphalangeal joints). Enhanced melanin output in patients with chronic renal failure may cause the proximal part of the nail bed to turn brown.<sup>72</sup> The anterior portion of the nail bed can turn white in patients with renal impairment disease, demolishing the lunula and resulting in half-brown, half-white nails, also known as half-and-half nails.<sup>72</sup>

### **Nail disorders due to infection and allergic reactions**

#### **Rippled nails**

If the outer layer of the nail is coursed or deformed, it could be an early symptom of psoriasis or reactive arthritis. Nail pigmentation is common, and the skin beneath the nail can appear reddish-brown.<sup>73</sup>

#### **Puffy nail fold**

Inflammatory response of the nail fold occurs when the skin around the nail would seem red and puffy. It could be



caused by lupus or perhaps another connective tissue disease. Erythema and inflammatory processes of the nail fold can also be caused by infection.<sup>74</sup>

## TREATMENT OPTIONS

### Drug Treatment

The diseased nail can be removed, and the doctor can recommend oral pills or medicines to apply topically to the nails. Terbinafine (Lamisil), itraconazole (Sporanox), or fluconazole is taken orally (Diflucan). Onychomycosis infection is incorporated within the nail, finding it challenging for medicines to invade. Topical therapeutic approaches are useless.<sup>75</sup> Oral terbinafine (Lamisil) is seen to be an appropriate long-term therapeutic approach for fungal diseases with minimal side effects than other oral agents. Terbinafine has also been shown to be a successful treatment in high-risk patients, such as those with type 2 diabetes or HIV infection.<sup>76</sup> Oral itraconazole (Sporanox) may be a more appropriate cure for yeast or nondermatophytic mould onychomycosis. Fluconazole (Diflucan) taken orally is also an effective remedy for onychomycosis infections. Oral drug therapy's beneficial effects may not be noticeable for 12 to 18 months. Long-term incidence rates of onychomycosis have been estimated to vary between 20% and 50%.<sup>77</sup>

The intensity of the nail condition, the extent of the skin condition, and/or the occurrence of joint involvement must all be thoroughly evaluated to ensure that patients with nail psoriasis obtain appropriate therapy. Behavioral approaches that reduce the Koebner phenomenon, especially in relation to footwear, nail care, and strenuous manual tasks, are also important components of intervention.<sup>78</sup>

Topical or intralesional corticoids, as well as topical vitamin D3 analogues, are the most widely recommended therapies for nail psoriasis. Due to the low absorption rates demonstrated in this region, research indicates that using 0.05 percent clobetasol propionate in gel or cream form in the periungual region may only cause a slight significant impact in patient manifestations.<sup>79</sup> The effectiveness of hydroxypropyl-chitosan nail lacquer was also investigated in a 24-week study involving 28 patients. The intervention was well tolerated by all patients and occurred in a 72% reduction in pitting and a 60% reduction in leuconychia and onycholysis. Other appropriate topical treatments for nail psoriasis include tacrolimus, fluorouracil, topical cyclosporine, tazaroten, and anthralin. In stubborn cases, radiotherapy may be used.<sup>80</sup>

### Other Procedures<sup>81</sup>

- Lesion removal or contraction
- Thrombus contraction
- Occasionally remove the nail by surgical means

### Some other supportive treatments

Comprehensive treatment plans for nail disorders can include several supportive treatments.

#### Supplements

Almost all forms of malnutrition can impair nail growth. These dietary suggestions can help alleviate symptoms. Avoid potential food allergens like dairy, wheat (gluten), corn, preservatives, and dietary supplements. The doctor may recommend testing for food intolerance.<sup>82</sup>

Avoid processed foods, use healthy oils in food products, minimise trans-fat, prevent unnecessary coffee and other toxic substances, alcohol and tobacco, drink 6-8 glasses of purified water daily, and physical activity for at least 30 minutes per day. Nutritional supplements such as omega-3 fatty acids, probiotic supplements, L-glutamine, and others can help with malnourishment.<sup>83</sup>

#### Herbs

Herbs are a great way to nurture and tone your body. Before administering any intervention, a doctor must first identify the cause. Herbs are available in dry extract, glycerine extract, and alcohol extract forms. A teaspoon of herbs in a cup of hot water can be used to make the tea. It is recommended that you drink 2-4 glasses of water per day. The tincture can be used alone or in combination, as directed. Tea tree oil, standardized extracts of green tea, and reishi mushroom are examples of herbs that can be used.<sup>84</sup>

#### Homeopathy

Numerous studies have been conducted to evaluate the effectiveness of various homoeopathic remedies. Professional homoeopaths, on the other hand, may suggest one or more of the following interventions for nail disorders based on prior knowledge and medical knowledge. Homeopathy takes into account the physical, psychological, and intellectual makeup of a person. All of these factors are considered by skilled homoeopaths when deciding the right treatment for a specific person. Pot marigold and Sulphur, for example.<sup>85</sup>

#### Acupuncture

Acupuncture can help with immune system function, digestive health, and trying to deal with medical issues.<sup>86</sup>

#### Massage

Massage increases blood flow and aids in the transportation of nutrients to the nails.<sup>87</sup>

#### Hydrotherapy

Combining hot and cold foot baths aids in the transport of blood and immune cells to the diseased nail. Fill one bucket halfway with hot water and the other halfway with cold water. Immerse feet for 3 minutes in hot water, followed by 1 minute in cold water. Repeat this process three times, then rub the feet vigorously with a dry towel. To boost the beneficial impact, add seven droplets of lavender essential



oil to hot water. Individuals suffering from vascular disease or other forms of cardiovascular or peripheral neuropathy should not engage in cold water immersion without supervision of a doctor.<sup>88</sup>

### Probable complications

The majority of nail problems are purely cosmetic in nature. Toenail regeneration typically takes 8-12 months, but fingernail regeneration takes half that time. Problems include tissue inflammation and nail deflection. Hair, tooth, and glandular irregularities are also associated with nail disorders.<sup>89</sup>

### Prevention to common nails problems<sup>90, 91, 92</sup>

1. Apply hand cream frequently throughout the day. Be sure to massage the cream into the nail and cuticle.
2. Wear gloves when you are working in your garden or when the weather turns cold.
3. Wear cotton-lined rubber gloves or disposable plastic gloves to protect your hands from overexposure to water, detergents, and other chemicals.
4. Trim your fingernails weekly, after bathing, when they are softer.
  - a) Do not trim nails too short.
  - b) Use an emery board and sharp manicure scissors or clippers to trim your fingernails. Nails that are smooth and well-cared for are less likely to become damaged.
5. Trim toenails monthly, after bathing.
  - a) Cut them straight across and leave the nails a little longer at the corners so that the sharp ends don't cut into your skin.
  - b) If you have a chronic disease, such as diabetes, peripheral arterial disease, or a disease that causes problems with your immune system, discuss with your doctor the best way to trim your toenails before trimming them yourself.
6. Be especially careful when trimming baby's nails.
7. Avoid trimming your cuticles. Even a minor cut alongside your nail can cause infection.
8. Do not bite or pick at the nails.

### To prevent a fungal nail infection<sup>93, 94</sup>

1. Keep the feet clean and dry. Dry feet are less likely to become infected. Apply powder to the feet when needed.
2. Wear clean, dry socks. Change the socks once a day or more frequently if they become wet.
3. Wear roomy shoes that allow air to circulate around the feet.

4. Wear shower sandals or shower shoes when use public pools, spas, and showers.

### To prevent problems with artificial nails<sup>95, 96</sup>

1. Test for a reaction to the artificial nail by having just one nail applied. Wait several days to see whether redness, itching, pain, or rash around or under the nail or separation of the nail from the nail bed develops.
2. Do not apply an artificial nail if the nail or the skin around the nail looks irritated or infected.
3. If an artificial nail does separate from the nail bed, dip your fingertip into rubbing alcohol for 15 seconds before reattaching the artificial nail. This will clean the space between the nails.
4. Do not wear artificial nails for longer than 3 months at a time. Give your natural nails a month to rest before reapplying artificial nails.

### CONCLUSION

Nail disorders can arise at any age. About half of all nail disorders are of infectious origin, 15% are due to inflammatory or metabolic conditions, and 5% are due to malignancies and pigment disturbances. Nail disorders are a common reason for dermatologic consultation. They are assessed by clinical inspection, dermatoscopy, diagnostic imaging, microbiological (including mycological) testing, and histopathological examination. Bacterial infections of the nails are rarer than fungal colonization. High-risk groups for nail disorders include diabetics, dialysis patients, transplant recipients, and cancer patients. Evaluation of the nail organ is an important diagnostic instrument. Aside from onychomycosis, which is a common nail disorder, important differential diagnoses such as malignant diseases, drug side effects, and bacterial infections must be considered. Healthy nails have a smooth and uniform color. Anything else that affects the growth or appearance of the nails may indicate anomalies. The treatment usually involves preventing further nail injury and treating the primary condition. A thorough examination of the fingernails and toenails during physical testing reveals local nail abnormalities to be treated or provides evidence of an underlying systemic disease that requires further investigation.

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