Nail Health

Nails are important for many reasons, including aesthetic appeal. They can also serve as important barometers offering clues to a person's overall health. Indeed, conditions as seemingly benign as increased nail thickness, horizontal white lines in the nails, or nail concavity (spooning) may be an indication of a variety of problems, ranging from anemia to endocarditis to connective tissue disorders (Fawcett RS et al 2004). Common nail complaints include brittle, dry nails and infection with a variety of pathogens.

Aging can cause slowed nail growth and brittle, dull, or yellowish nails. Other significant causes of nail abnormalities include environmental factors (e.g., exposure to chemicals, polishes, or harsh detergents; prolonged water exposure; reaction to adhesives used in artificial nails; use of certain medications) and injury or trauma (e.g., striking fingers with a hammer, closing fingers in doors, stubbing a toe, wearing ill-fitted footwear, biting nails habitually).

In many cases, treating nail disorders is frustrating for physicians and patients alike. Nail disorders such as fungal infections are difficult to treat, and healing is slow. Worse yet, a few of the common prescription medications used to treat nail disorders have potentially significant side effects, especially liver damage. Natural agents, such as vitamin E, that have been shown to support strong nails may offer the same benefits as prescription drugs without the risk of serious side effects. It is also important to know that if a nail condition is caused by an underlying disease, such as diabetes, you should seek treatment for that condition.

ANATOMY OF NAILS

Nails are composed of a hard, strong protein called keratin, as well as small amounts of sulfur, calcium, fats, and water. The nail plate is the visible part of the nail, and it protects the sensitive nail bed underneath it. The folds of skin that surround the nail on three sides are called nail folds. Within the nail plate is the cuticle, which is connected to the nail folds and nail plate, and the lunula, the whitish, half-moon-shaped area at the base of the nail. Nails grow from the matrix, an area under the cuticle, at a rate averaging one tenth of an inch per month. Healthy nails grow continuously; serious illnesses can leave behind tell-tale signs called growth arrest lines, also known as Beau's lines.

Some of the most often reported nail problems are also among the most bothersome aesthetically and emotionally, even though many of them are not medically serious. Others, such as yellow nail syndrome, may by caused by a serious underlying disease. Below are some of the more common complaints.

Paronychia. Paronychia infection of the nail folds can be caused by bacteria, fungi, or viruses. This condition can cause pain, redness, and swelling of the nail folds and may be seen in people who keep their hands in water for extended periods.

Brittle nails. Brittle nails are one of the most common complaints. They are generally characterized by vertical splitting or separation of the nail plate at the end of the nail. This is often a consequence of aging as the flow of moisture and natural oils to the nail bed declines.

Ingrown toenail. Ingrown toenails typically affect the great ("big") toe and occur when a corner of the nail curves downward into the skin. This condition can be very painful and lead to infection. Ingrown toenails are usually caused by improper nail trimming, poor posture, or tight shoes. Nails should always be cut longer than the tips of the toe to prevent the advancing edge of the nail plate from "digging in" to the soft tissue of the nail folds.

Nail psoriasis. This nail abnormality occurs primarily in patients who also have psoriasis of the skin and is seen in about 80 percent of people who have inflammatory arthritis associated with psoriasis, especially when the arthritis affects the toes and fingers. Characteristics include yellow-red discoloration of the nail, pitting, separation of the nail plate from the nail bed, crumbling or splitting of the nail plate, and subungual hyperkeratosis (Farber EM et al 1992).

Onychomycosis. Approximately 7 percent of adults in North America contract this fungal infection, which invades the nail plate, causing the nail to separate from the nail plate (onycholysis) and chalky debris to form under the nail plate (Gupta AK et al 1997, 2000). More than 90 percent of cases are caused by one of two pathogens: Trichophyton rubrum or Trichophyton mentagrophytes. Factors that have an important effect on the development of onychomycosis include increasing age; genetics; and the presence of diabetes, acquired immunodeficiency syndrome, or peripheral arterial disease (Faergemann J et al 2003). One multicenter study reported that diabetics are nearly three times more likely to develop onychomycosis than nondiabetics and that up to one third of diabetics may develop nail fungus (Gupta AK et al 1998).

Pitting. The formation of tiny depressions in the nail plate is known as pitting; it can be caused by any localized skin condition that interrupts natural growth of the nail. Pitting occurs in up to 50 percent of patients who have psoriasis and is also a common problem in people who have connective tissue disorders, including Alopecia areata, Incontinentia pigmenti, pemphigus, Reiter's syndrome, and sarcoidosis.

White nails (Terry's nails). This nail abnormality is characterized by a white nail bed with a pink band that is 1 to 2 mm wide at the tip. In most cases, all the fingernails are affected, although it can affect a single finger. White nails affects about 80 percent of people who have severe liver disease (Fawcett RS et al 2004). It is also seen in people with type 2 diabetes, chronic renal failure, or congestive heart failure and is associated with advancing age as well (Dolan C et al 2004).

CONVENTIONAL TREATMENT

Most nail abnormalities are associated with underlying medical conditions and resolve as those conditions are treated. Infections of the nails, such as with fungus or bacteria, are a significant exception in that they may respond to specific treatment. Although both topical and oral medications are available, topical agents typically are not very effective because the infections are usually under the nail, and topical medications cannot penetrate the nail plate (Kyle AA et al 2004). For paronychia, or nail infection, antibiotics and surgical drainage of the infected nail fold may be recommended (Shaw J et al 2005).

For nail fungus, one of two oral medications is usually prescribed: Lamisil® (terbinafine) or Sporanox® (itraconazole). The use of these drugs is associated with liver toxicity, however. In rare cases, liver failure and death have occurred, especially among people who have severe underlying systemic conditions (Food and Drug Administration 2001). Use of these drugs should be closely monitored by a physician.

Lamisil®. In an open-label, randomized, multicenter trial, 75 patients age 65 or older who had moderate to severe onychomycosis were treated with 250 mg Lamisil® daily for 12 weeks. Half also underwent four sessions of aggressive debridement (surgical removal of fungus). At the 48-week follow-up, 64 percent of the patients had mycologic cure and reported that the drug had been well tolerated. Those who also underwent debridement appeared to fare better than those who did not (Tavakkol A et al 2006).

In a comparative, randomized study of 30 patients with onychomycosis, either Lamisil® or Sporanox® was administered for 16 weeks, and patients were followed up for 36 weeks. At the end of follow-up, little or no nail deformity was seen in 86.7 percent of the Sporanox® group and 100 percent of the Lamisil® group. Reported side effects included nausea, abdominal cramps, back pain, flu-like syndrome, and headache (Sikder AU et al 2006).

While Lamisil® alone has proven to be effective in onychomycosis, researchers have found that Lamisil® combined with topical ciclopirox nail lacquer is more effective than Lamisil® alone. Eighty patients with onychomycosis received either oral Lamisil® 250 mg daily for 16 weeks or the same Lamisil® protocol plus ciclopirox nail lacquer applied once daily for 9 months. After nine months of follow-up, the infection cleared in 64.7 percent of the Lamisil-only patients and 88.2 percent of those who got the combination therapy (Avner S et al. 2005).

Sporanox®. Use of Sporanox®, both alone and in combination with another medication, has proved effective in the treatment of onychomycosis. One study reported significant results when patients used 100 mg daily for six months (Kawada A et al 2004), and another study found that pulse therapy (200 mg daily for one week per month over 5.6 ± 4.3 months) resulted in a 62 percent cure rate overall (Hiruma M et al 2001).

Use of Sporanox® pulse therapy and amorolfine 5 percent solution nail lacquer was examined in a randomized study. Forty-five patients received two pulse treatments plus amorolfine for six months, and another 45 patients received three pulse treatments of Sporanox® but did not apply amorolfine. The investigators found that the combination treatment was as safe and effective as Sporanox® alone, with less cost per patient (Rigopoulos D et al 2003).

For patients who are prone to onychomycosis, treatment may never completely eliminate the disease (Sigurgeirsson B et al 2002; Tosti A et al 1998). In fact, treatment fails in 25 to 40 percent of onychomycosis cases (Hay RJ 2001). Combining drug therapies (an oral and a topical medication) or combining drug therapy with mechanical debridement can be successful.

Treating nail psoriasis. Oral drug treatment of nail psoriasis remains problematic because of the high cost of the drugs (e.g., methotrexate, acitretin, and cyclosporine) and their potential for systemic complications. Several topical medications may be helpful. Calcipotriol, for example, has proved effective for psoriatic nails and can be used in chronic cases (Zakeri M et al 2005). In one study, a combination of 1 percent 5-fluorouracil cream and 20 percent urea resulted in improvement of more than 50 percent of the clinical signs of nail psoriasis in 59 patients (Fritz K 1989). Side effects of topical agents may include burning, tingling, and swelling at or near the application sites.

For serious ingrown toenails that have not responded to topical or oral medications, surgery is an option. Several types of operations that use a modification of the Zadik method and artificial skin have proved effective (Iida N et al 2004).

NUTRITIONAL THERAPY FOR HEALTHY NAILS

Natural remedies for nail treatment face the same obstacles as prescription agents: it is difficult to deliver healing agents to the site of the infection. However, a few nutrients stand out for their ability to support strong, healthy nails.

Silicon. Silicon is an essential trace mineral that is vital to the health of bone and skin. It helps facilitate the formation of collagen, which is necessary for the strength and healthy development of epithelial and skeletal connective tissue. In a recent study, silicon was examined for its ability to improve skin and nail health in women who had sun-damaged skin. Chronic exposure to sunlight has been shown to damage connective tissue, which causes loss of elasticity in skin. In this randomized, double-blind, placebo-controlled study, women were given 10 mg daily of either a bioavailable silicon or placebo. Measurements of skin and nail health were taken throughout the study. At the end of 20 weeks, the women taking silicon had decreased skin roughness and less-brittle nails and hair, showing that silicon had a significantly positive effect on nails, skin, and hair (Barel A et al 2005). This study used a stabilized orthosilicic acid, which is the form of silicon with the greatest bioavailability.

Vitamin E. The results of several small studies show that vitamin E can be effective in the treatment of the nail changes in yellow nail syndrome, which also has profound effects on heart and lung function that must be treated separately (Williams HC et al 1991). A few studies found that high doses (800 to 1200 IU daily for several months) were effective in some patients (Rommel A et al 1985; Venencie PY et al 1984; Ayres S et al 1973), and another study focused on topical vitamin E used twice daily for 12 months, which also provided noticeable results (Williams HC et al 1991).

Biotin. In one study, supplementation with the B-complex vitamin biotin increased nail thickness by 25 percent in the majority of participants (63 percent) who had brittle nails. Nearly all patients had improved hardness and firmness after taking 2.5 mg biotin daily for an average of 5.5 months (Floersheim GL 1989). In another study, researchers reported that patients who took biotin daily for three to six months experienced a significant decrease in brittleness and splitting (Hochman LG et al 1993). Increased nail thickness was evident after biotin supplementation in yet another study, in which progress was identified using scanning electron microscopy (Colombo VE et al 1990).

Iron. Iron-deficiency anemia, which affects 20 percent of women and 50 percent of pregnant women, can affect the nails by causing brittleness if it becomes severe. A blood test should be used to diagnose iron-deficiency anemia in people with brittle nails. Supplementation with iron should take place under the supervision of a physician.

Zinc. A zinc deficiency has been associated with poor nail health, manifesting as deformed nails, hangnails, inflamed cuticles, and white spots in the nail plate. A few small studies show that oral supplements of zinc can be helpful in resolving nail abnormalities in yellow nail syndrome (Hausmann M et al 1994; Arroyo JF et al 1993).

L-cysteine. L-cysteine is a conditionally essential amino acid, one of only three sulfur-containing amino acids. The others are taurine (which can be produced from L-cysteine) and L-methionine, from which L-cysteine can be produced in the body by a multistep process. L-cysteine is an important component of keratin, hair, and nails.

Prevention: Proper Nail Care

To help achieve and maintain healthy looking nails, consider the following guidelines:

- Use cotton-lined rubber gloves when doing dishes or using harsh chemicals, then wash hands with a gentle soap and dry them thoroughly (perspiration buildup inside gloves can set the stage for fungal infections). Renew and replace gloves frequently to reduce possible fungus accumulations.
- Avoid biting your nails or picking at your cuticles.
- Keep nails clipped slightly longer than tip of finger or toe to prevent hangnails or ingrown nails.
- To avoid ingrown toenails, wear shoes with a toe box that does not squeeze your toes together.
- Try to keep your nails short, square-shaped, and slightly round on the top. It is best to trim brittle nails after a bath (they will be more supple then) and apply moisturizer.
- If your nails are very brittle, avoid nail polish.
- If your nails or cuticles are dry, consider moisturizing them at bedtime and wearing cotton gloves while you sleep.
- Use nail polish remover no more than twice a month. If necessary, touch up nails with polish.
- Mend split or torn nails with nail glue or clear polish.

To avoid fungal infections, follow these tips:

- Wear shower shoes or flip-flops in communal showers.

- Make sure your feet and body are thoroughly dried.
- Avoid sharing towels or clothing.
- Use nonirritating soaps and detergents.

LIFE EXTENSION FOUNDATION RECOMMENDATIONS

The condition of our fingernails reflects our overall health. Many factors contribute to the condition of nails, and some of those factors are related to serious medical conditions. Underlying conditions, such as iron-deficiency anemia, should be treated. The following supplements have been shown to support strong, healthy nails:

- **Biosil** (a source of bioavailable silicon)—6 to 12 drops orally daily
- **Vitamin E**—400 international units (IU) daily
- **Biotin**—2500 to 5000 micrograms (mcg) daily
- **Iron**—If testing reveals iron-deficiency anemia, consult your physician for dosage.
- **Zinc**—50 milligrams (mg) daily
- **L-cysteine**—1500 mg daily

In addition, supplementing with whey protein (40 g daily) and eating a healthful diet rich in fruits and vegetables can help support overall health, reducing the risk of developing nail problems.

PRODUCT AVAILABILITY

All the nutrients and supplements discussed in this section are available through the Life Extension Foundation Buyers Club, Inc. For ordering information, call anytime toll-free 1-800-544-4440, or visit us online at www.LifeExtension.com.

The blood tests discussed in this section are available through Life Extension National Diagnostics, Inc. For ordering information, call anytime toll-free 1-800-208-3444, or visit us online at www.LifeExtension.com.

NAILS SAFETY CAVEATS

An aggressive program of dietary supplementation should not be launched without the supervision of a qualified physician. Several of the nutrients suggested in this protocol may have adverse effects. These include:

Iron

- Do not take iron if you have hemochromatosis or hemosiderosis.
- Consult your doctor before taking iron supplements if you have an elevated serum ferritin level, alcoholic cirrhosis, a pancreatic insufficiency, or a history of chronic liver failure, chronic alcoholism, gastritis, peptic ulcer disease, or gastrointestinal bleeding.

L-Cysteine

- Do not take L-cysteine if you form renal stones, particularly cystine stones.
- L-cysteine can produce a false-positive result in the nitroprusside test for ketone bodies used in diabetes.

Silicon

- High doses of silicon may cause siliceous renal calculi.

Vitamin E

- Consult your doctor before taking vitamin E if you take warfarin (Coumadin).
- Consult your doctor before taking high doses of vitamin E if you have a vitamin K deficiency or a history of liver failure.
- Consult your doctor before taking vitamin E if you have a history of any bleeding disorder such as peptic ulcers, hemorrhagic stroke, or hemophilia.
- Discontinue using vitamin E 1 month before any surgical procedure.

Zinc

- High doses of zinc (above 30 milligrams daily) can cause adverse reactions.
- Zinc can cause a metallic taste, headache, drowsiness, and gastrointestinal symptoms such as nausea and diarrhea.
- High doses of zinc can lead to copper deficiency and hypochromic microcytic anemia secondary to zinc-induced copper deficiency.
- High doses of zinc may suppress the immune system.

For more information see the Safety Appendix