



A HEALTHY KANSAS STARTS HERE

Nailing Down Nail Disorders

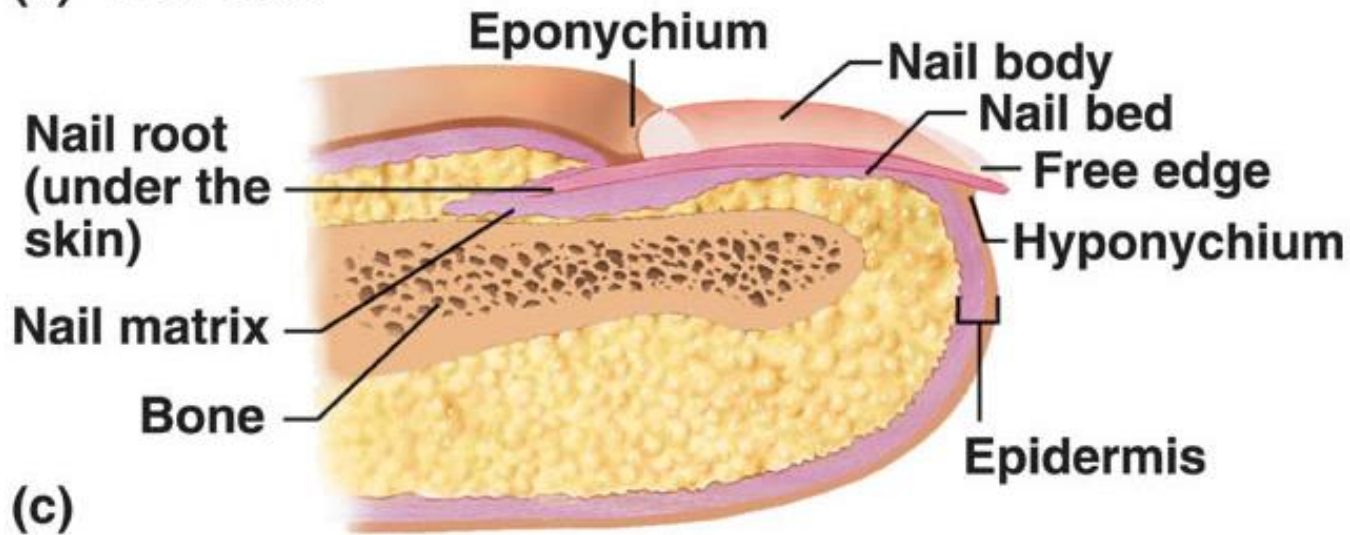
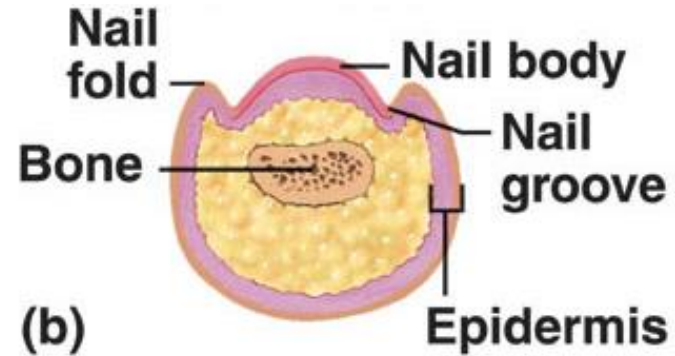
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Anatomy of Nails

- Lunula
- Eponychium (cuticle)
- Nail fold
- Nail groove
- Nail bed
- Nail matrix

Anatomy of Nails



“My nails have ridges!”



Onychorrhexis

- Nail thickening and ridging in a longitudinal pattern
- Longitudinal splitting can be superficial or deep
- Women are more frequently affected
- Incidence is 15% higher in patients older than 60 years

Onychorrhexis

Exogenous trauma

- Chemical exposure
- Frequent handwashing
- Manicures/pedicures

Lichen planus

- Hallmark feature
- Large midline indentation or ridging

Treatment

- External: Nail lacquer—in specific, hydroxypropyl chitosan-based lacquer
- Internal: Biotin 10 mg daily
- Improvement more than 53% in onychodystrophy global severity score with lacquer
- > 80% with lacquer plus Biotin

Problems with Biotin

- Can interfere with lab tests that use biotin-streptavidin based immunoassay to improve sensitivity
- **TSH, pro-BNP, parathyroid hormone, troponin**
- People taking 10 mg /day should delay test for 8 hour
- If taking 100-300 mg, delay test for 3 days

“My nails have divets!”



Koilonychia

Associated with

- Lichen planus
- Iron deficiency anemia
- Endocrine disorders
- SLE/Raynaud's
- Nutritional deficiencies
- Mechanics /
hairdressers

Work Up

- CBC
- Iron studies
- TSH/ HgbA1c
- ANA and other
connective tissue
disease evaluation
- Eval for Carpal Tunnel

Onychomycosis

Subungual DLSO



Superficial



Onychomycosis

Diagnosis

- KOH prep
- Culture
- Periodic Acid Schiff stain

Mimics

- Chronic trauma
 - Basketball
 - Soccer
 - Tennis
- Psoriasis

Onychomycosis Severity Index

- Developed by committee of nail dermatology experts
- Tested on physicians and medical students viewing same photographs— showed high statistical reliability
- Nails with lower OSI scores (≤ 5) were more likely to respond to conventional therapies
- Nails with severe scores (35) were difficult cases, with low cure rates

Onychomycosis Severity Index

- Mild nail involvement with onychomycosis is classified as a score of 5 or less; moderate, 6 through 15; and severe, 16 through 35
- A baseline or clinically cured nail is classified as a score of 0

Table 2. Onychomycosis Severity Index^a

Area of Involvement		Proximity of Disease to Matrix		Presence of Dermatophytoma or Subungual Hyperkeratosis >2 mm	
Affected Nail, %	No. of Points	Amount of Involvement From Distal Edge	No. of Points	Present	No. of Points
0	0	<1/4	1	No	0
1-10	1	1/4-1/2	2	Yes	10
11-25	2	>1/2-3/4	3		
26-50	3	>3/4	4		
51-75	4	Matrix involvement	5		
76-100	5				

^aThe Onychomycosis Severity Index is calculated as follows: the score for area of involvement is multiplied by the score for the proximity of disease to the matrix, and 10 points are added for the presence of a dermatophytoma or subungual hyperkeratosis of greater than 2 mm. A cumulative score of 0 indicates cured; 1 through 5, mild onychomycosis; 6 through 15, moderate onychomycosis; and 16 through 35, severe onychomycosis.

Defining Cure for Onychomycosis

- **Clinical cure:** 100% visually clear nail
- **Mycological cure:** Nail results and negative KOH preparations and negative fungal culture
- **Complete cure:** 100% visually clear nail and mycological cure

Treating Onychomycosis

Systemic

- Terbinafine
- Itraconazole
- Fluconazole**
- Daily versus pulse

Topical

- Ciclopirox
- Tavaborole
- Efinaconazole
- Mentholated ointment

***Fluconazole was FDA approved for use in humans in 1990 but is not approved for the treatment of onychomycosis in the US or Canada*

Topical Treatments

- Daily application for 48 weeks
- More successful in women, patients with great toenail involvement only, those with relatively short duration of disease, and those lacking tinea pedis
- Important to integrate treatment of associated skin fungal infections (between 4th and 5th toes or on the bottom of the foot)
- Efinaconazole has higher cure rates in peds population (down to age 6)

Topical Treatments

Drug name		Efinaconazole	Tavaborole	Ciclopirox
Efficacy	MC	53.4-55.3%	31.1-35.9%	29-36%
	CC	15.2-18.8%	6.5-9.1%	5.5- 8.5%
Pediatric	MC	65%		
	CC	40%	8.5%	
Pregnancy Cat		C	C	B
Cost		\$701 - \$1,525	\$567 - \$1,748	\$9.39

Systemic Antifungals

Drug name	Terbinafine	Itraconazole	Fluconazole**
Spectrum of action	Dermatophytes, Some activity against NDMs	Dermatophytes, NDMs, and <i>Candida</i> spp	Dermatophytes, some NDMs, and <i>Candida</i> spp.
Efficacy MC CC	70% 38%	54% 14%	47-62% 28-36%
Pregnancy Category	B	C	D

** Fluconazole was FDA approved for use in humans in 1990 but is not approved for the treatment of onychomycosis in the US or Canada

Systemic Antifungals

Drug Name	Terbinafine	Itraconazole	Fluconazole**
Nail concentration	1 week	1-2 weeks	1 day
Early detection in nail	30-36 weeks	Pulse: 1 month 11 months (3 pulses)	6 months
Post treatment			
Hepatitis	1:50,000-1-120,000	1:500,000	
Liver enzyme elevation	2 times ULN: 3.3%	2 times ULN: 1-5%	> 8 times ULN: 1%
Drug interactions	TCA, Antiarrhythmic class 1 C (flecainide) Beta blockers	Antiarrhythmics (digoxin), Benzos, Calcium channel blockers, Protease inhibitors	Amphotericin B, Benzos, Calcium Channel blockers, Fentanyl, OCPs

** Fluconazole was FDA approved for use in humans in 1990 but is not approved for the treatment of onychomycosis in the US or Canada

Terbinafine Regimens

Daily

- 250 mg daily
- 6 weeks for fingernails
- 12 weeks for toenails

Pulsed

- Off label
- 250 mg daily
- 4 weeks on/ 4 weeks off
- 2 cycles
- Comparable cure rates to daily treatment

Itraconazole Regimens

Daily

- 200 mg daily
- 12 weeks for toenails

Pulsed

- 400 mg daily for 1 week
- 3 weeks of no drug
- 2 pulses for fingernails
- 3 pulses for toenails

Booster Dosing

- Slow growing nails
 - Thick nail plates > 2 mm
 - Lateral involvement
 - > 75% nail involvement
 - immunosuppression
 - Additional 4 weeks of terbinafine
- Or
- Additional pulse of Itraconazole
 - 6-9 months after initiation of antifungal therapy

Choosing Wisely

- *Don't prescribe oral antifungal therapy for suspected nail fungus without confirmation of fungal infection*

– American Academy of Dermatology

Culture Technique

- DLSO: Clean off the nail with alcohol
- Clip off the most distal aspect of the nail plate
- Scrape subungual debris into the collection receptacle
- SWO: (superficial)
- Requires scrapings from the dorsal nail plate

Nondermatophyte Molds (NDMs)

- Account for 10% of onychomycotic infections
- Have been ignored as contaminants
- Present with yellow = white discoloration with inflammation and purulent discharge
- May be involvement of nail matrix with tenderness and periungual inflammation

Nail Growth Rate

Fingernails

- Regrowth of a fingernail takes at least 6 months
- Grow approx. 0.1mm/day

Toenails

- Regrowth of the toenail takes 12 to 18 months
- Grow approx. 0.03 mm/day

Color Changes: Dyschromia

- Any color alteration of the otherwise transparent nail
- Dyschromia that results from external exposure produces discoloration that follows the shape of the proximal nail fold
- Dyschromia that results from a systemic disease or drug produces discoloration that corresponds with the shape of the lunula

“My toenail turned black!”

- 26-year-old male
- Just noticed a new dark area under his big toenail

Exam findings

- Critical questions?
- Next step?



Longitudinal Melanonychia

- Brown/black longitudinal band that extends from the nail matrix to the distal edge of the nail plate
- Caused by melanocytic activation or melanocyte proliferation
- Most are benign



Image obtained from Google Images

Subungual Melanoma

Reassuring

- Been there a long time
- Unchanged in size
- Dark skinned person

Concerning

- Family Hx of melanoma
- ***Single nail involvement (especially thumb, index finger or great toe)***
- Band width > 6 mm
- Pigmentation of the skin of the nail fold or proximal nail bed
- New pigmentation in person between 50-79 years
- New longitudinal band in a light skinned person

Subungual Melanoma

- *“Please stress the importance of doing a nail matrix biopsy when biopsying pigmented lesions. Nail bed biopsies are insufficient to exclude a nail unit melanoma”*

-Dr. Brandon Litzner

Compare: Hematoma versus Melanoma



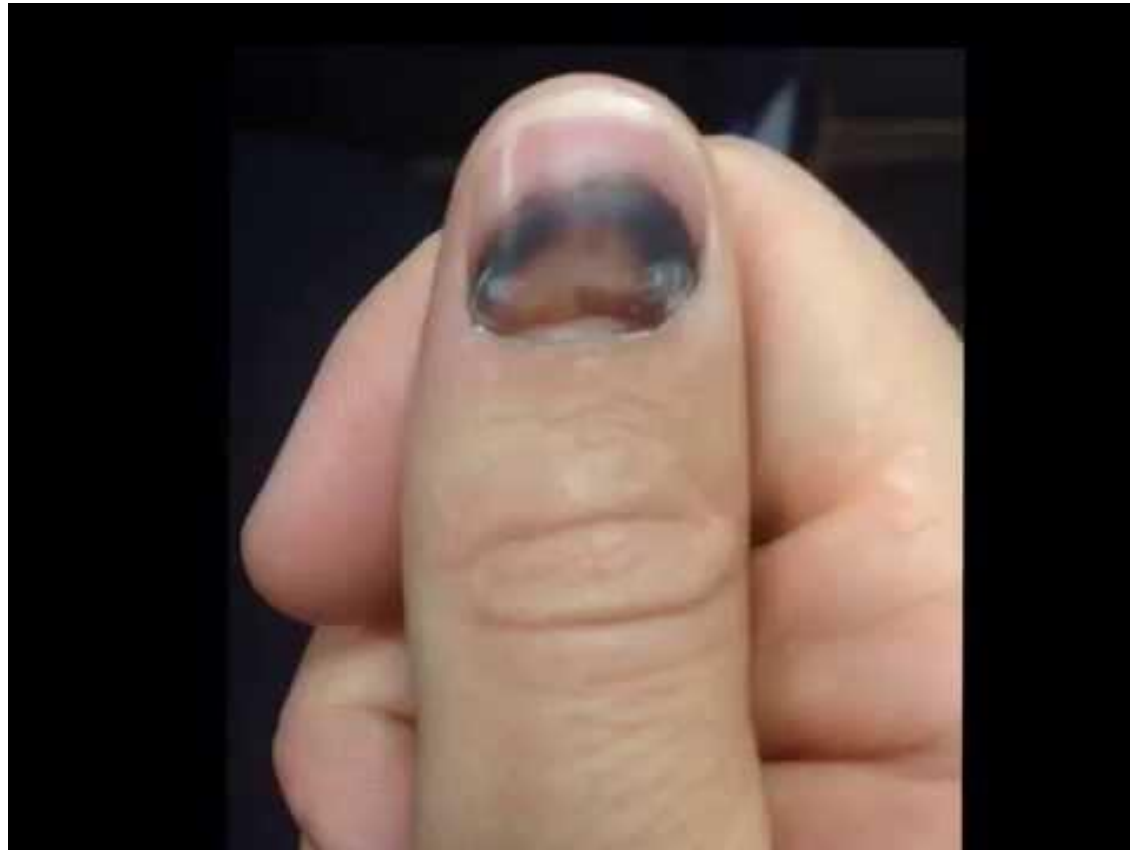
Runner's Toenails



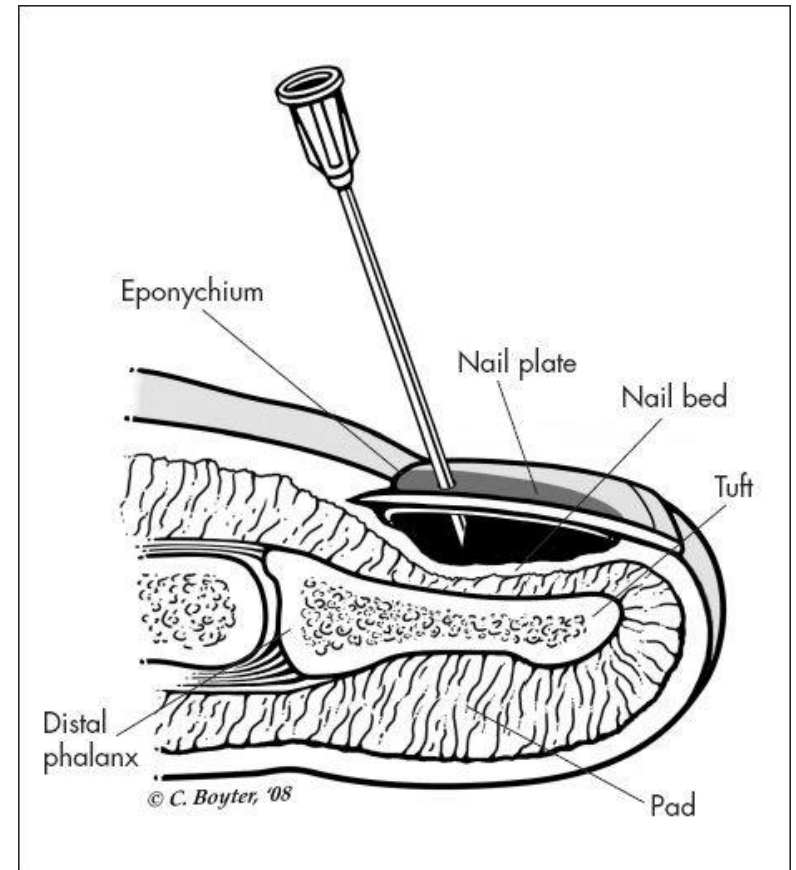
Image obtained from Google Images

- More common in people with long second and third toes
- Typically running long distances
- May need to time treatment to goal race

“Ouch—I hit my thumb with a hammer—will you amputate it?”



Trephination of the Nail



“This just started”



Bacterial vs. Viral

- Occupation—why?
- Exposure of hands to chronic wet environment
- Exposure to different pathogens for healthcare workers
- Do you bite your nails?
- Oral flora changes treatment direction
- History of herpes?

Paronychia

- If no abscess: warm water compresses and soak in Burow's solution
- If mild: topical antibiotic alone or in combination with topical steroid
- Persistent: tx with oral anti-staphylococcal antibiotics
- Nail biters/ hangnail biters: treat against anaerobes due to exposure to oral flora
- Abscess: I and D

Burow's Solution

Drug Facts

Active Ingredient Purpose

Aluminum Acetate 5.3%.....Astringent/ant-inflammatory

Use

An astringent used as an anti-inflammatory wet dressing for the relief of minor irritations of skin conditions such as insect bites, poison ivy, and athlete's foot.

Warnings

- For External Use Only
- Avoid contact with eyes and mucous membranes.

When using this product

- Discontinue use if condition worsens, does not improve or if symptoms persist for more than 7 days and consult a doctor.

Keep out of reach of children. In case of accidental ingestion, seek professional assistance or contact a poison Control Center immediately.

Packed by:
HUMCO, Texarkana, TX 75501
Questions or Comments?
31-800-662-3435
"We Help People Feel Better"

Drug Facts (continued)

Directions

- For use as a compress or wet dressing; dilute with 10 to 40 parts water; saturate a clean, soft, white cloth (such as a diaper or torn sheet) in the solution, gently squeeze and apply loosely to the affected area. Saturate cloth in solution every 15 to 30 minutes and apply to the affected area. Repeat as often as necessary. Discard remaining solution after use. Do not cover compress or wet dressing with plastic or other impervious material.

Inactive ingredient

Purified Water.

REV 081408.RLG

3 03950 05516 9

Go to:
www.simplehomeremedies.com
to find helpful hints, and learn more about Aluminum Acetate.

Image obtained from Google Images

- Astringent and antibacterial properties
- Used to treat skin conditions such as insect bites, poison ivy/sumac, swelling, allergies and bruises
- Cold compresses over the affected area

OUCH!!!



Image obtained from Google Images

- Why would you choose to I and D?
- What kind of anesthesia would you use?

Differential Diagnosis of Paronychia

- Psoriasis
- Reiter Syndrome
- Herpetic Whitlow

Psoriatic Nails



Psoriatic Nails

- Up to 90% of patients with psoriasis experience nail changes at some point during their lifetime
- Nail matrix psoriasis leads to nail pitting, leukonychia, or crumbling and destruction of the nail plate
- Nailbed involvement leads to oil drop spots/salmon patches, splinter hemorrhages, nailbed hyperkeratosis, and thickening of the nail plate

Leukonychia



Oil drop spots



Reiter's Changes



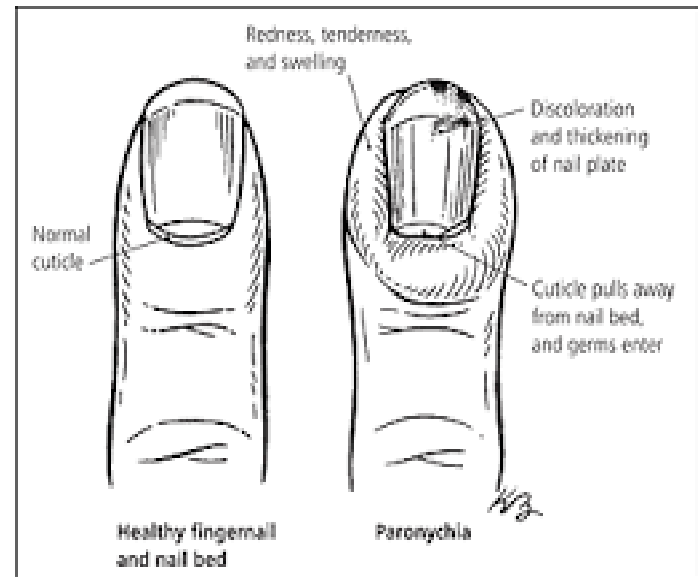
Herpetic Whitlow



Herpetic Whitlow

- Single or grouped blisters with a honeycombed appearance close to the nail, erythematous base
- Usually only on one finger
- If multiple fingers—possibly coxsackie virus
- I and D is contraindicated
- Oral acyclovir is suggested for immune suppressed patients
- Self-limiting: 2-3 weeks

Chronic Paronychia



Chronic Paronychia

Occupations

- Laundry workers
- Cleaning staff
- Food handlers
- Cooks
- Dishwashers
- Bartenders
- Nurses

Medical Risks

- Diabetes
- Retinoids
- Protease inhibitors
- Cetuximab

Chronic Paronychia

- One or more nails are affected
- Thumb and 2nd or 3rd fingers of the dominant hand
- Thickened nail plate
- Pronounced transverse ridges
- Usually present at least 6 weeks at time of diagnosis
- Retraction of the proximal nail fold
- Absence of cuticle

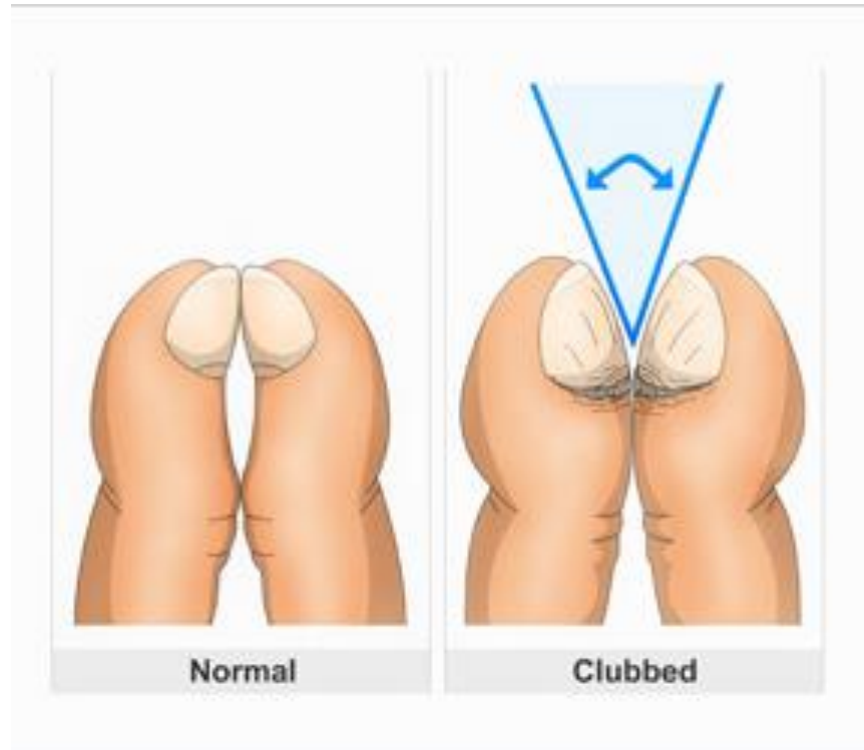
Treatment of Chronic Paronychia

- Avoid exposure to irritants
- Apply emollients to lubricate the cuticle
- Topical steroids
- Trial of systemic antifungals
- 9 weeks of drug treatment usually effective in mild to moderate cases
- Surgical approaches

“What does this mean to you,
doctor?”



Schamroth Sign



- Obliteration of the normal diamond shaped space at the proximal end when the distal phalanges are opposed

Image obtained from Google Images

Clubbing

Found with pulmonary diseases:

- Bronchogenic carcinoma
- Bronchiectasis
- Lung abscess
- Empyema
- Pulmonary fibrosis
- Cystic fibrosis
- Congenital heart disease

WORK UP:

- CXR
- PFTs
- Consider chest CT in a smoker
- O2 sat and/or an ABG
- CBC

Beau's Lines



Image obtained from Google Images

- Emerge from under the cuticle 4 to 8 weeks after the matrix insult
- Results from a transient decrease of the matrix mitotic activity resulting in a focal thinning of the nail plate
- Parallel the distal edge of the luna

Beau's Lines

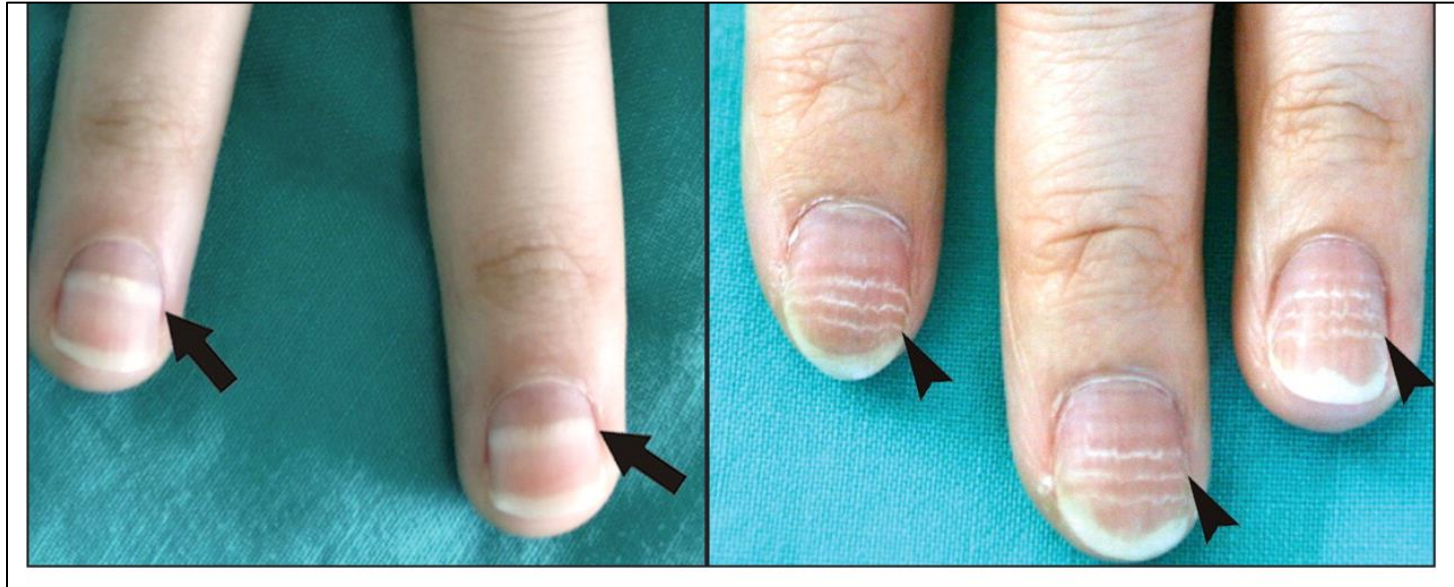


Image obtained from Google Images

- 1 single transverse groove on one nail secondary to a local phenomenon (trauma)
- 1 groove on several nails reflects a systemic event

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THANK YOU



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