

KNITTING ERGONOMICS

Ergonomics is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human wellbeing and overall system performance.

4 elements: Productivity, efficiency & safety all interact with environment. These elements must be properly balanced.

Goal: to ensure that your activity is performed comfortably in your environment

Knitters have specific vulnerabilities: neck, shoulder, upper back, fingers/thumbs, wrists, elbows and lower back.

HOW WE GET INJURED

Most common problems:

- (1) tendinitis (muscle to bone)- inflammation & micro tears, usually elbow, wrist, thumb
- (2) neural compression- restriction or pressure on nerves (e.g., carpal tunnel syndrome)
- (3) low back & neck pain

Risk Factors for injury: older than 50, female, smoking, prior injury, inactive, osteoarthritis, neck or back problems, high alcohol intake, always sitting while knitting, participating in other activities that may add to injury (e.g., computer use, gardening, cooking).

* Always think about frequency, duration & intensity

SOME GENERAL GUIDELINES ABOUT NECK, SHOULDERS & BACK

Neck

- lighting: poor lighting risks bending too far forward and stressing the neck
- keep your natural curve as much as possible
- look up frequently
- use tools to elevate instructions & charts
- Knit Companion, anyone?

Shoulders

- no slouching!
- be aware of forward shoulder roll
- avoid heavy knitting bags
- beware armrests, your shoulders should stay down

Back

- sit up straight, don't cross legs
- edge of seat should not hit the back of your knees
- protect your natural lumbar curve (small pillow or folded towel)
- get up frequently, every 20 minutes or so (drink lots of water or tea, you'll have to get up frequently!)

SOME SPECIFIC INJURIES

-Carpal Tunnel Syndrome: median nerve impingement at the wrist (pain, tingling, weakness of hands)

-Cubital Tunnel Syndrome: ulnar nerve entrapment at the elbow (funny bone sensation, elbow and forearm pain, numbness of fingers 3, 4 & 5) Don't rest elbows on table.

-DeQuervain's Tenosynovitis: inflammation at thumb side of wrist (anatomical snuff box) (pain with pinch and grasp, sticking sensation in thumb with movement, pain and swelling near base of thumb)

Trigger Finger: finger gets stuck in bent position, may have pop, click, pain with movement

Tennis Elbow/lateral epicondylitis: caused by excessive wrist extension. Pain at lateral elbow, especially with movement of fingers, hands, wrists, forearm, especially rotation

Golfer's Elbow/medial epicondylitis: caused by excessive wrist flexion. Pain at inside of elbow, especially with movement of fingers, hands, wrists, forearm

ERGONOMIC ISSUES SPECIFIC TO KNITTING

Needles

- pair needles to project

- consider amount of friction between yarn and needles
- use slick needles with grabby yarn, maybe wood with slippery yarn
- sharp tips are better with tight stitches & denser gauges
- splitty yarn may require blunter tips
- square needles can decrease pressure on fingers if flat part rests against finger
- straight needles put extra pressure on the 4th & 5th fingers and forearms from the weight of the project
- circular needles decrease and more evenly disperse the weight of the project

HOW WE HOLD OUR NEEDLES

3 Basic Principles to Consider

- (1) Neutral postures are important
- (2) Less movement = more efficiency
- (3) Both hands moving = decreased efficiency

Continental vs English:

Continental (German, Russian, Scandinavian)

- left needle still, right needle moves, working yarn with stable needle
- shortens distance to access new yarn & speeds the process of picking it up
- not always the most efficient, especially if left needle is not stabilized or if working yarn isn't near the tip of the needle

English

- flicking with the use of a knitting belt is probably the most efficient
- avoid pencil hold, causes awkward forearm posture
- avoid wrapping yarn with a pinch grip

- avoid pushing needle point with index finger to pull yarn through after wrapping
- avoid using left index finger to push each stitch off the left needle after it is worked

RECOMMENDATIONS FOR PREVENTION

- use excellent lighting
- use good posture, a comfortable seat, sit up straight, lumbar support as needed
- look up frequently
- get up frequently (every 20 minutes)
- don't rest elbows or wrists on the table, try a pillow on your lap
- keep neutral posture for wrists
- use caution with arm rests, they are often too high or not positioned right
- avoid hanging heavy knitting bags on shoulders, use a roller bag.
- keep neutral wrist postures
- work near the tips of the needles
- match needles to yarn
- switch between projects
- stop knitting if you develop problems, allow your body time to heal & resume slowly
- see a professional for persistent problems
- beware NSAID's, common causes of GI bleeds and kidney failure
- keep fit and active

STRETCHING EXERCISES

- all exercises to be done gently within your range of motion

- skip stretches if you have a problem in that particular area
- stop any movement that hurts
- breathe through your stretch

NECK

- (1) Side to side gentle head rotation
- (2) Ear to shoulder stretches
- (3) Neck extension, look up gently, don't do if you have pinched nerves in neck
- (4) Chin tucks, looking forward, stand straight with chest out, slide chin backwards like a turtle

CHEST & SHOULDERS

- (1) Standing, lace fingers behind back, lift rib cage, lift hands & arms upward behind you
- (2) Reach right hand over right shoulder to back, bring left hand under left armpit to back, try to touch hands behind back. Repeat on other side.

LUMBAR SPINE

- (1) Back bends, stand with feet one foot apart, place hands on hips, thumbs pointing down and forward, gently lean backwards on your hands
- (2) Side bends
- (3) Trunk rotation

QUADRICEPS (demo)

- (1) Standing quad stretches, hold onto chair or counter, bend knee to bring heel toward butt, hold top of foot with same side hand, pull toward butt, knee should be pointing down. Can do this seated off side of chair or prone on bed using a towel

HAMSTRINGS

- (1) step forward with heel, front leg stays straight, other leg bends at knee

ANKLES

- (1) seated ankle flex

FOREARMS

- (1) Wrist flexor stretches - stop sign, flex fingers back with other hand
- (2) Wrist extensor stretches - arms forward as if sleepwalking, make soft fists, drop fists down, turn fists out to the sides, swing arms around behind you.

THUMBS & FINGERS

- (1) Thenar eminence stretch - palms down on thighs with fingers facing each other and thumbs facing body, gently straighten elbows
- (2) Finkelstein stretch - hand shake position, fold thumb in, fold fingers on top of thumb, bend wrist downward

RESOURCES/REFERENCES

Knitting Comfortably; The Ergonomics of Handknitting by Carson Demers

YOUTUBE

Fruity Knitting, episodes 31 & 102 (guest Carson Demers)

Bob & Brad - Physical therapists with a wide variety of short videos for all sorts of problems. See Stuart McGill interviews for back pain. See Sara Meeks interviews for osteopenia & osteoporosis

Some of my favorite technique channels:

- Very Pink Knits
- Suzanne Bryan
- The Chilly Dog

ON LINE SEARCH TIPS FOR RELIABLE HEALTH/MEDICAL INFO

-type “research” or “medical research” before the subject, read the abstracts. Well known journals are possibly better (JAMA, New England Journal of Medicine, etc) Keep in mind that peer review is important and so are funding sources.

-type in “Medscape” before entering the search topic or diagnosis for in-depth review of diagnosis and treatment