Movement as Part of your Migraine Treatment Plan

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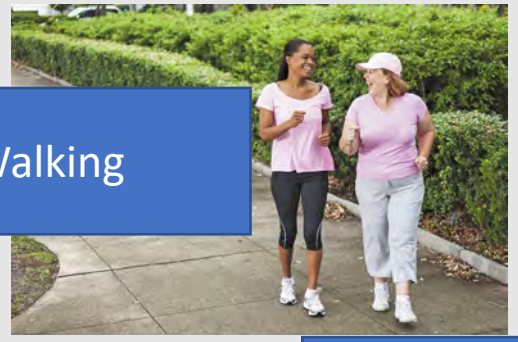
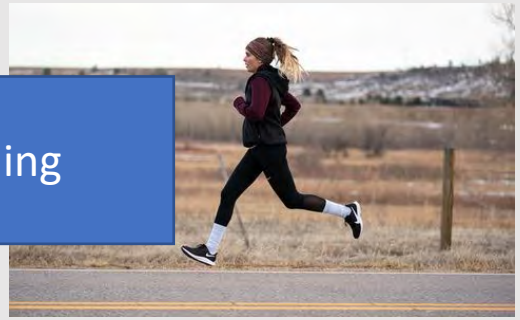
What is in the realm of movement?

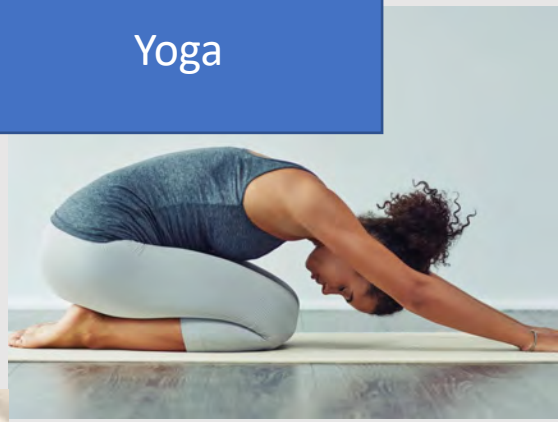
Walking



Running

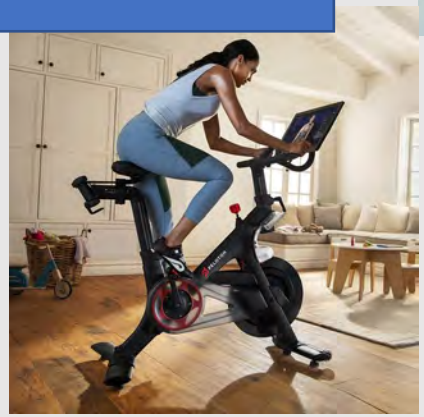


Yoga



Stretching

Spinning



Dancing

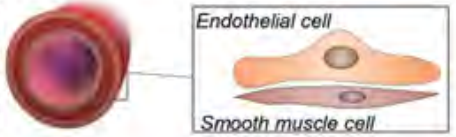
MILES FOR MIGRAINE

Sedentary Lifestyle is Common in U.S.

Sedentary: 21 hours

- Sleeping
- Sitting at work
- Watching TV
- Leisure time
- On home computer
- Eating

Active/Standing: 3 hours

	Mitochondrial	Skeletal Muscle	Cardiac Muscle	Conduit Arteries
				
Sedentary	•↑ mitochondrial DNA deletions and mutations[71] •Electron transport chain abnormalities[72] •↑ mitochondrial fission[73] •↓ mitochondrial content[74] •↓ respiration[4]	•↑ IL-6 and CRP[80] •Activation of proteolytic systems[81] •Inactivation of the PI3K/Akt/mTOR pathway[82] •↓ lean muscle mass[83] •Greater proportion of hybrid fibers possibly due to dysregulation in MHC isoform expression[84]	•↑ AGE accumulation indicative of collagen cross-linking[87] •↑ Left ventricular stiffness[88] •β-adrenergic receptor desensitization resulting in impaired inotropic and chronotropic responses to adrenergic stimulation[89, 90] •↓ SERCA2a contributes to prolonged calcium transients[91]	•↓ sympathetic baroreflex sensitivity and ↑ sympathetic activation[94] •↑ NOS uncoupling, ↓ NO bioavailability, thereby ↑ oxidative stress[94] •Extracellular matrix remodeling through elastin degradation by MMPs and formation of AGEs[95] •Endothelial dysfunction[96]
Physical Activity	•↑ mitochondrial protein turnover through degradation of damaged proteins and de novo synthesis of new functional proteins[75] •↑ expression of PGC-1α[76, 77] •↑ SIRT3 content[78] •↑ mitochondrial volume[79]	•↑ metabolic enzymes profile: citrate synthase, β-HAD, glycogen phosphorylase[85] •↓ catabolic mRNA expression (FOXO3a, MuRF-1, Atrogin-1, myostatin)[86] •↑ capillary-to-fiber ratio[85] •↑ insulin sensitivity[76]	•↑ SERCA2a mRNA & protein expression[92] •↑ phosphorylation of threonine-17 residue of phospholamban allowing for faster reuptake of cytoplasmic calcium[92] •↑ contractility and relaxation due to faster systolic rise and diastolic decay time of calcium[93] •↓ Left ventricular stiffness[88]	•Lower expression of the transcription factor p53 which is associated with senescence compared to sedentary counterparts[97] •Lower markers of senescence (p21 and p16)[97] •↓ expression of nitrotyrosine and NADPH oxidase (prooxidant)[96] •↑ expression of manganese SOD (antioxidant)[96]

Why does it matter?

- Correlation between low physical activity and migraine frequency (Koseoglu et al, 2015; Varkey et al, 2011)
- It might influence your brain (Koseoglu et al, 2015)
  - Decreasing stress reactivity
  - Improving sense of well-being
  - Changing sense of pain perception
- Reduction in migraine pain intensity, migraine days, and shorter duration of attack (Lemmens, 2019)

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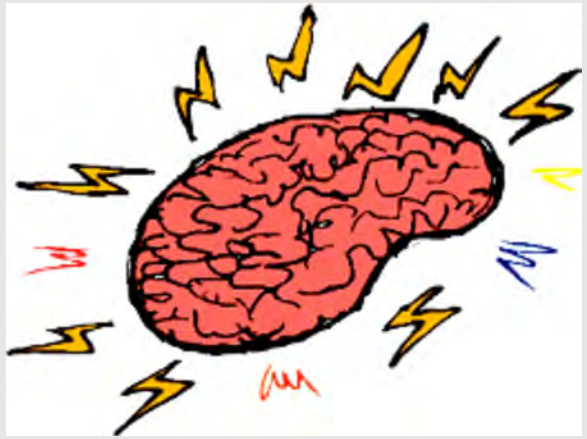
Increased Migraine Frequency



Happier Brain

MILES FOR MIGRAINE

What's stopping you?

- Anxiety and fear surrounding migraine (Farris, 2019)

- 22-38% have subjectively reported at least one migraine triggered by exercise in their lifetime → leaving exercise completely (Kelman, 2007)

ACSM recommendations: Average adult

AEROBIC EXERCISE

- 150 minutes per week of *moderate* intensity exercise

OR

- 75 minutes per week of *vigorous* intensity exercise

STRENGTHENING

- 2 days per week

STRETCHING

- 2-3 days per week

MILES FOR MIGRAINE

What about for migraine?

AEROBIC EXERCISE

- 150 minutes per week of *moderate* intensity exercise
- 75 minutes per week of *vigorous* intensity exercise

STRENGTHENING

- 2 days per week

STRETCHING

- 2-3 days per week

MILES FOR MIGRAINE

Aerobic exercise

- Warm up and cool down

- Average adult recommendations: At least 10-minute intervals with goal of 150 minutes per week
  - People with migraine – 30 minutes 3x/week

- **Moderate intensity** instead of vigorous intensity
  - Submaximal intensity = 50-85% HR max
  - HR max calculation = 220 - age

MILES FOR MIGRAINE

Heart rate (HR) maximum calculation

- 220 – age = HR Maximum
- Selen's Age: 33 y/o
- Selen's HR Maximum = 220 – 33 = 187 beats per minute (bpm)
- 50-85% = 93-159 bpm

Assessing your own heart rate

- Place 2nd and 3rd digits over wrist or carotid artery in neck and assess for pulse (as shown in pictures below)
- Count how many beats you feel in a period of 30 seconds.

Rating of Perceived Exertion (RPE) Scale

Borg Scale 6-20)	Intensity	Breathing Scale	Distance Scale
6	No exertion at all		
7		Can sing full songs	Could continue all day
8	Extremely light		Could continue 4–6 hours
9	Very light	Can sing partial verses	Could continue 3–4 hours
11	Light	Can talk in full sentences	Could continue 1–2 hours
12			Could continue 45–60 minutes
13	Somewhat hard	Can talk in short sentences	Could continue 30–45 minutes
14			Could continue 20–30 minutes
15	Hard (heavy)	Breathing hard, thinking clearly	Could continue 15–20 minutes
16			Could continue 10–15 minutes
18			Could continue 2–5 minutes
19	Extremely hard		Could continue 1–2 minutes
20	Maximal exertion		Could continue <1 minute

© Duplication of © Gunner Borg, 1970, 1985, 1994, 1998.

MILES FOR MIGRAINE

Tips for starting a program

Example: Walking

- 5 minutes per day
- Increase by 5 minutes every week until you reach goal
- Increase intensity slightly every week

Start small: Short distance/duration

How to progress: Every 1-2 weeks

Progress duration first

Frequency: Depends on your symptoms

Don't forget the warm-up and cool down

MILES FOR MIGRAINE

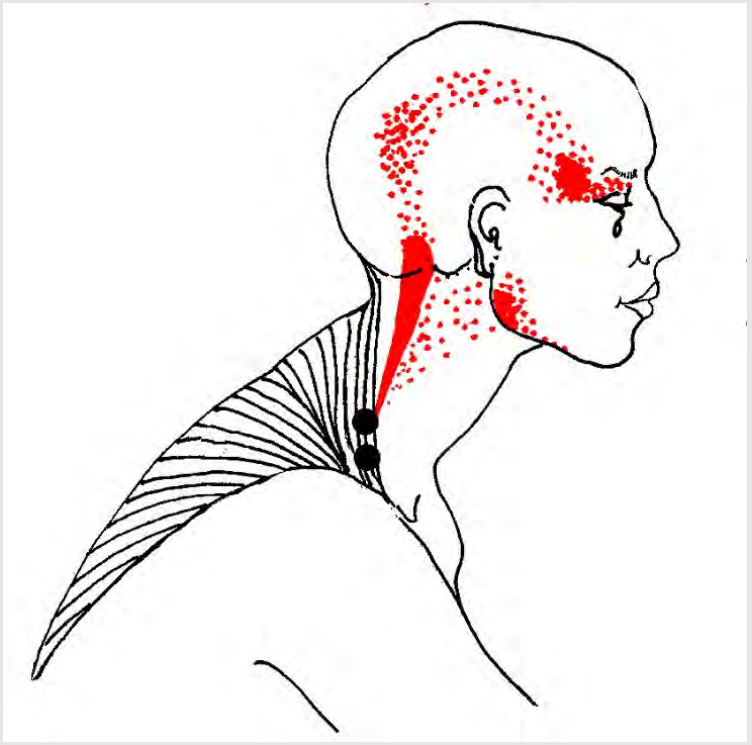
POSTURE

Why Does it Matter?

- 80% of people with migraine had local tenderness in their neck and 50% of those had headache-like symptoms with palpation. (Luedtke, May, 2017)

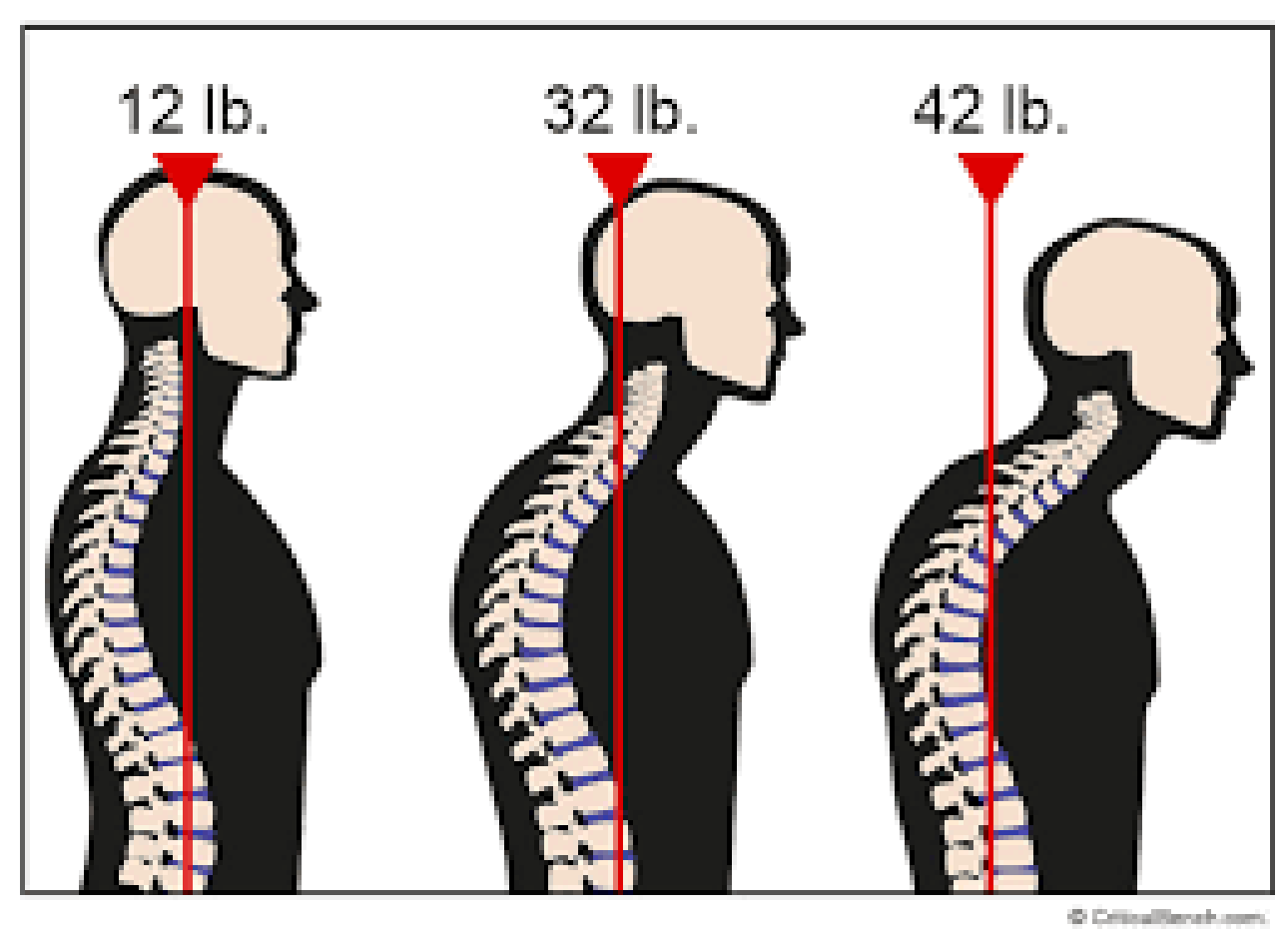
- High prevalence of musculoskeletal dysfunction in people with migraine. (Luedtke, Starke, May, 2017)

- One study showed that people with migraine tended to have a straightening of their natural neck curvature. (Ferracini, 2017)



MILES FOR MIGRAINE

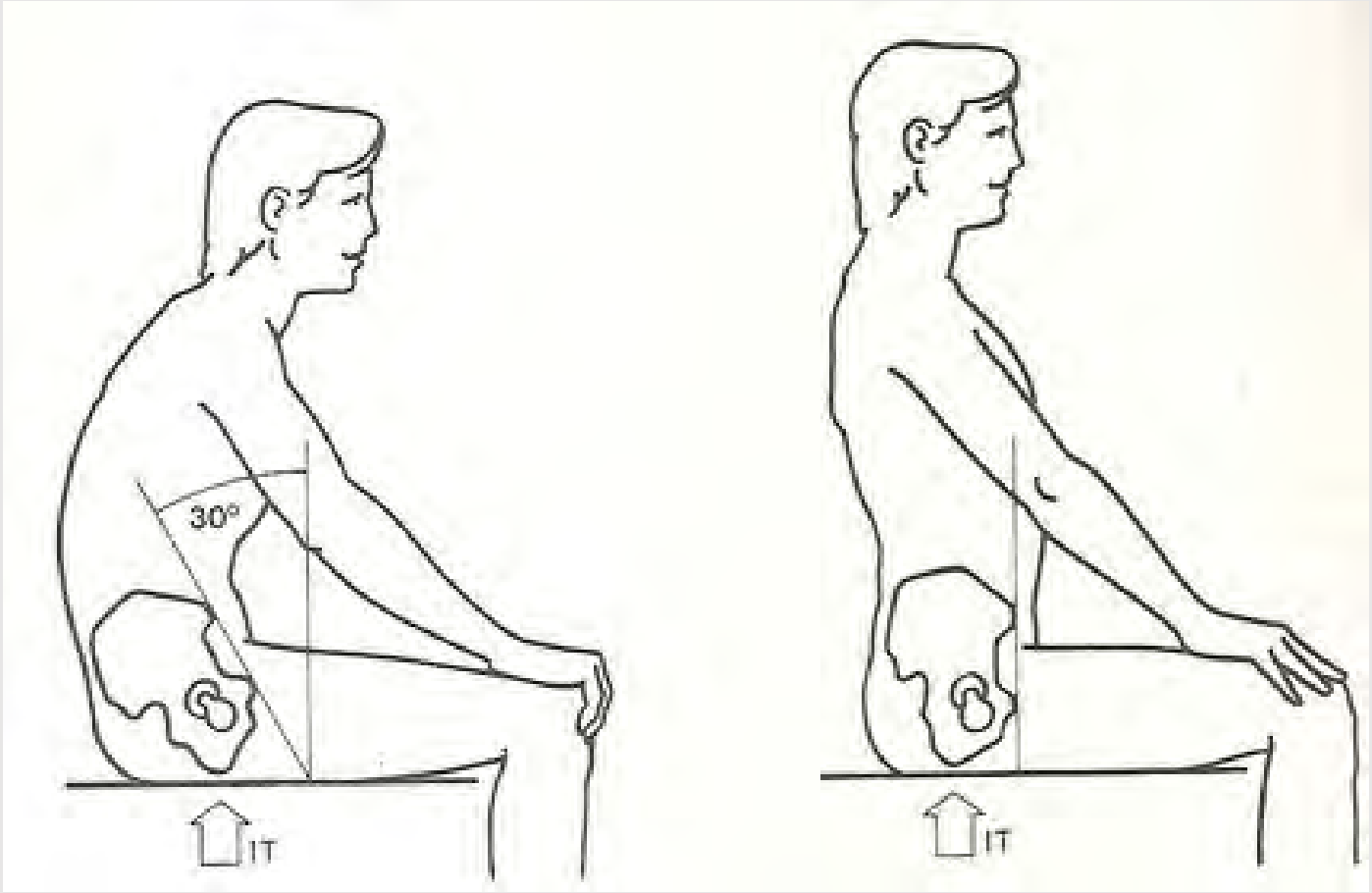
The amount of stress on your neck muscles changes based on your posture.



Normal cervical curve

Abnormal cervical curve

Posture: Pelvis positioning



Posture: Scapular stability

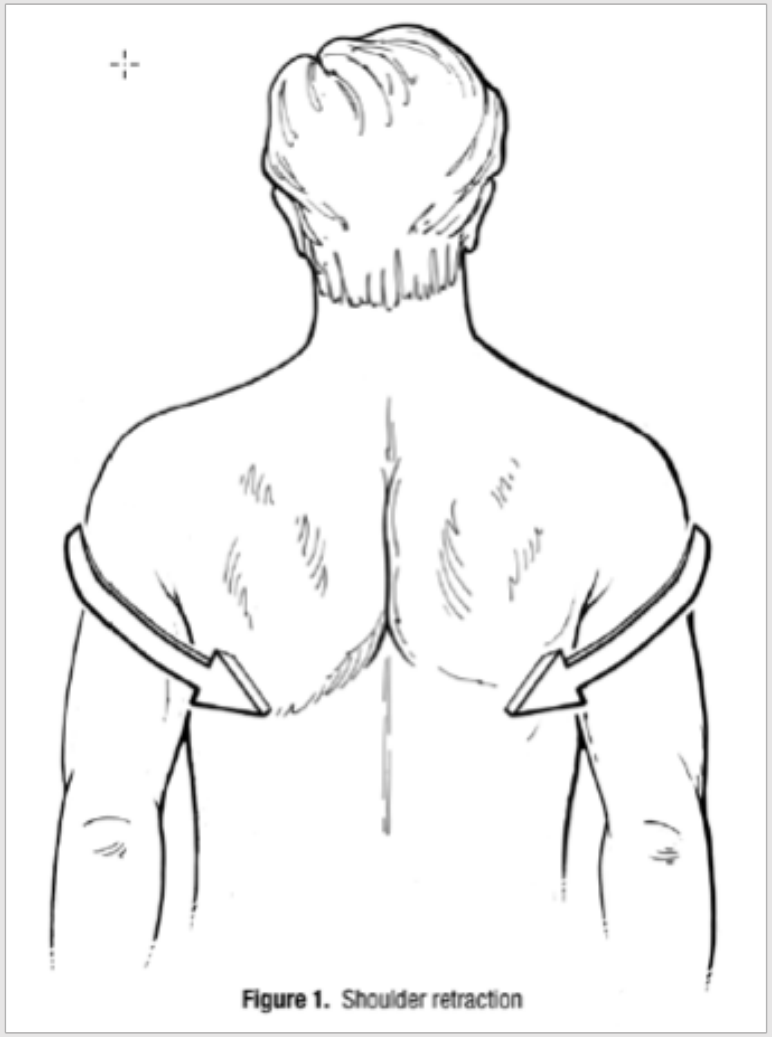
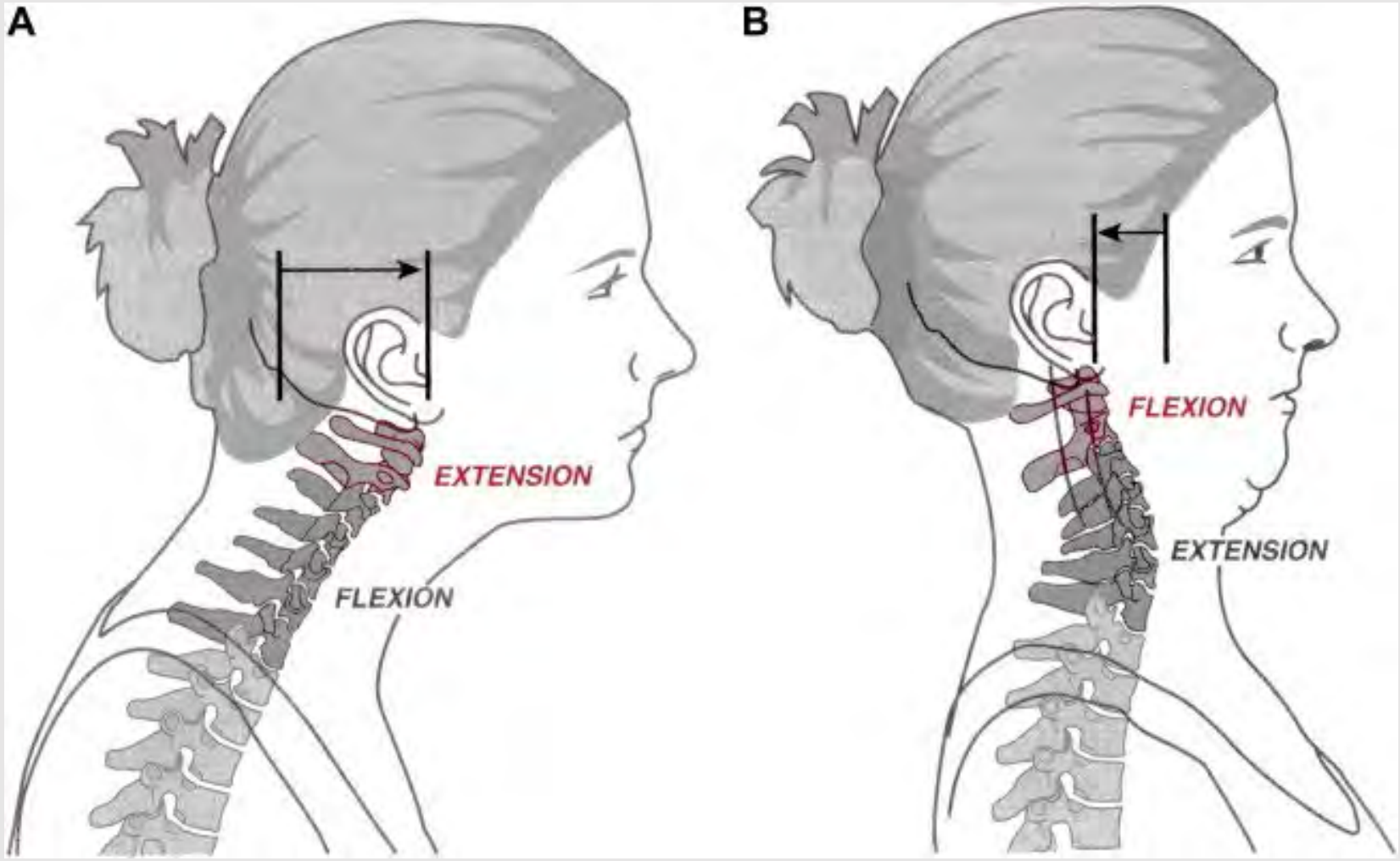
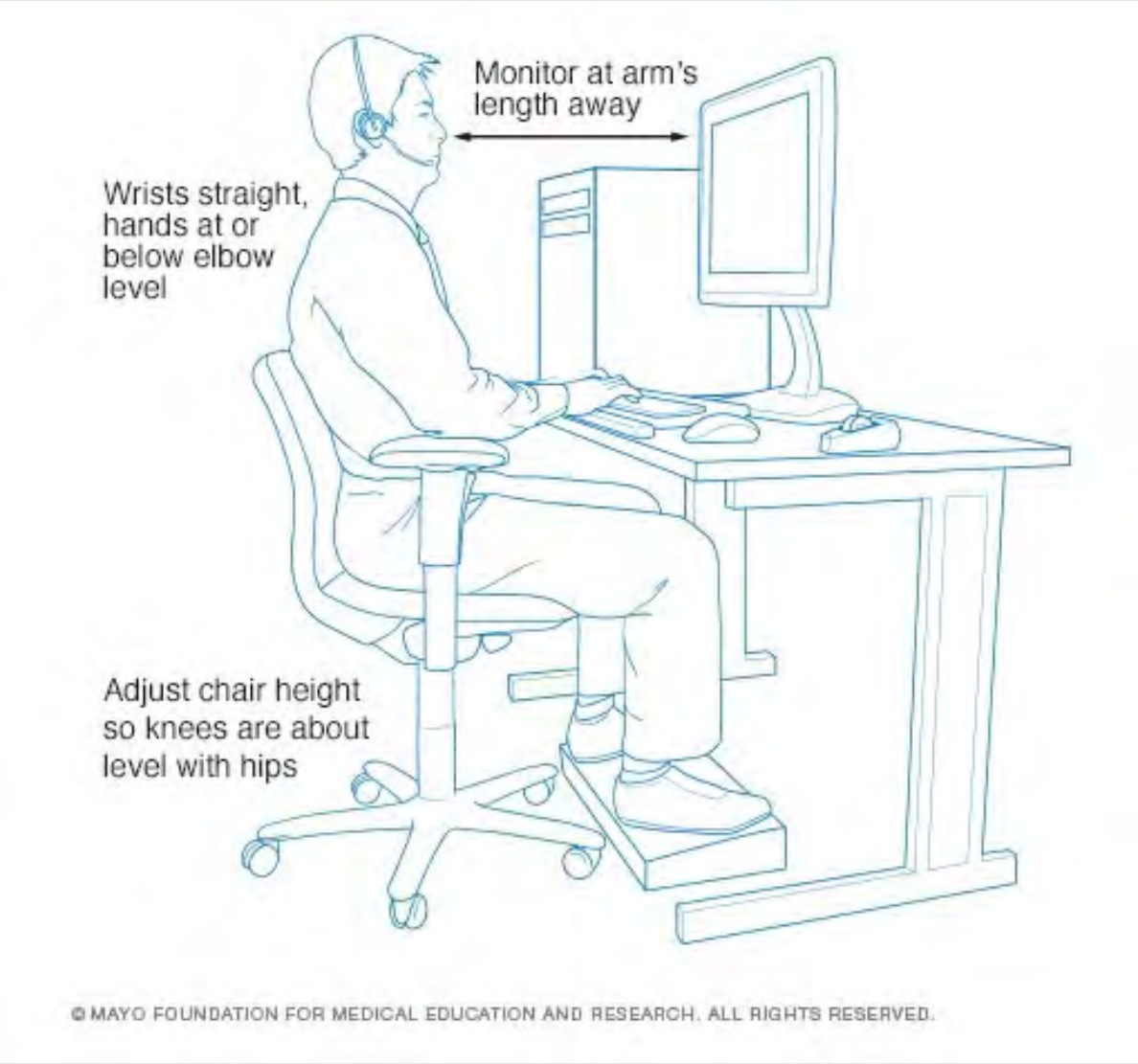


Figure 1. Shoulder retraction

Posture: Neck positioning



Posture: At the computer



Strength

Head nod and chin tuck (Figure 1)

1. Start by lying face up with a small rolled towel under the upper part of your neck.
2. Gently nod your head. Nod your chin around an imaginary axis through your ears.

Hold for _____ seconds.
Repeat _____ times.

Nod your chin around an imaginary axis through your ears.

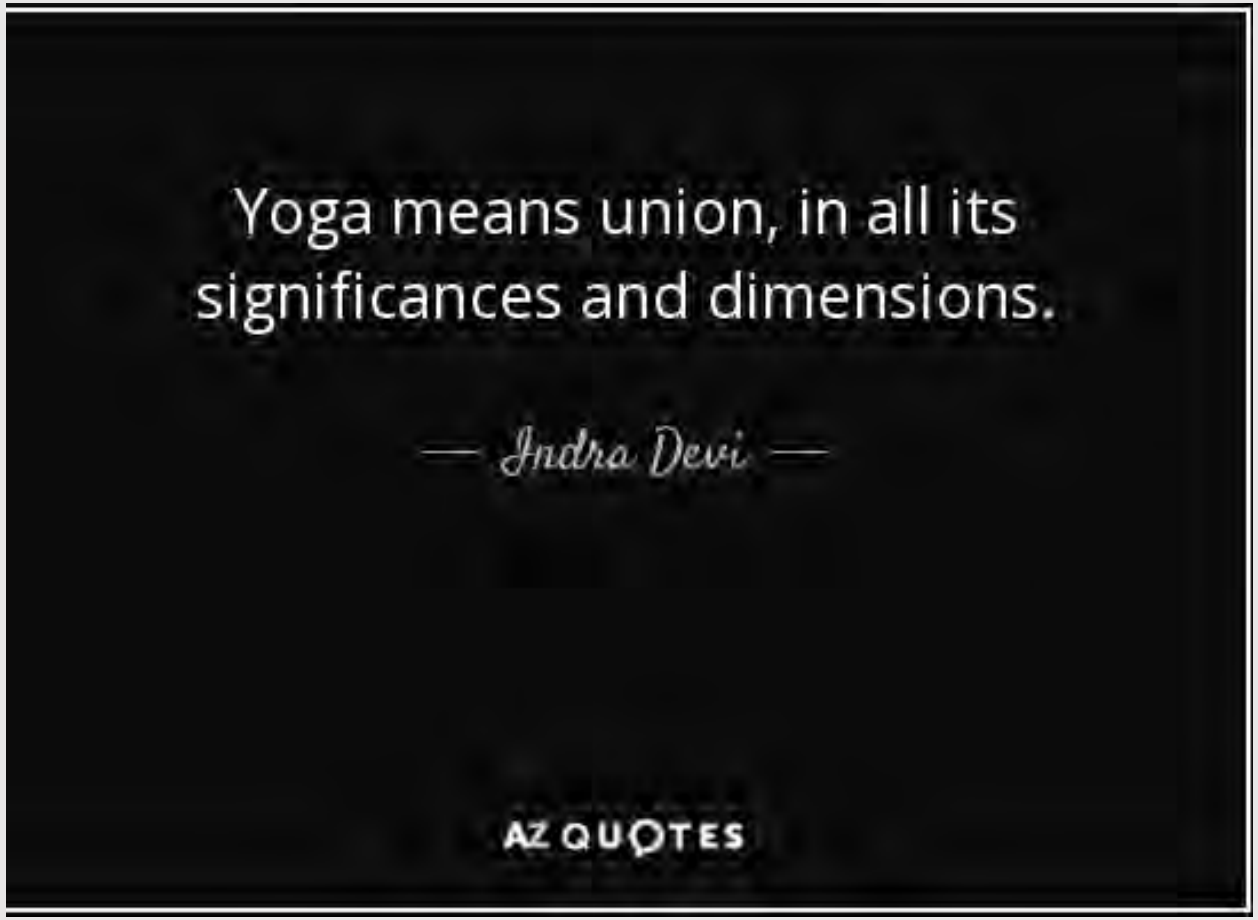
Yoga/Meditation

Why Does it Matter?

- Yoga has a positive impact on headache frequency, intensity, impact, and disability (Kumar, 2020)
- Meditation/mindfulness can help address rumination and pain catastrophizing (Wells, 2019)
- Mindfulness may promote nervous system recovery from a stressful event (Wells, 2019)

Yoga

- ”Union” – usually of the body and mind
- Originally used in preparation for meditation



Types of yoga

- Yin
- Vinyasa
- Bikram
- Kundalini
- Iyengar
- Anusara
- Hatha
- Restorative

Yoga tips

- Work with and listen to your own body
- Modifications are allowed – always
- Do not quit
- Focus on your breathing
- Every day is different

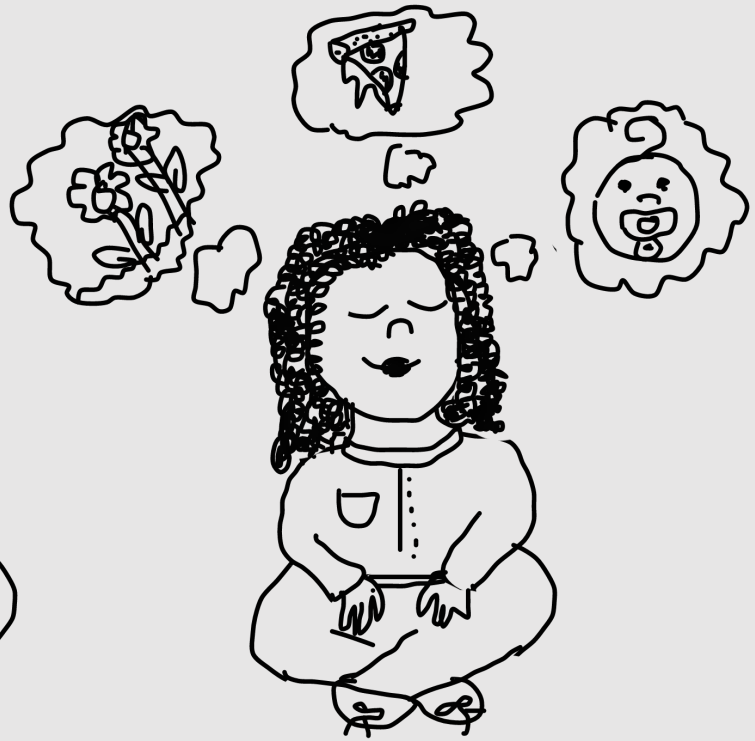
Being Present

Meditation

HOW LONG DO
I HAVE TO WASTE
MY TIME LIKE THIS?
OH CRAP..!
I FORGOT TO FOCUS
I SHOULD HAVE
GO FOR THE MOVIE
designed by freepik.com

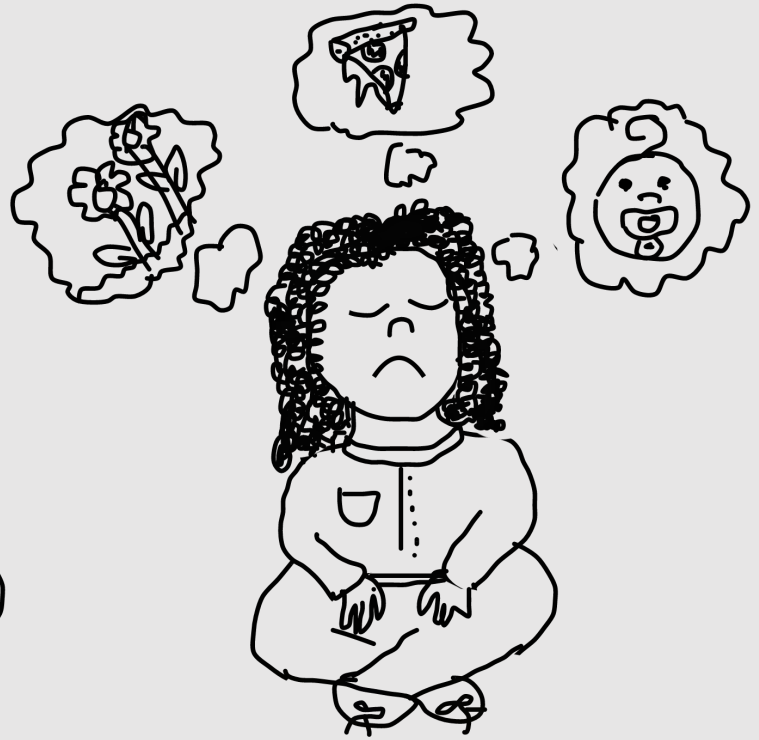
Being Present

Focusing on the breath



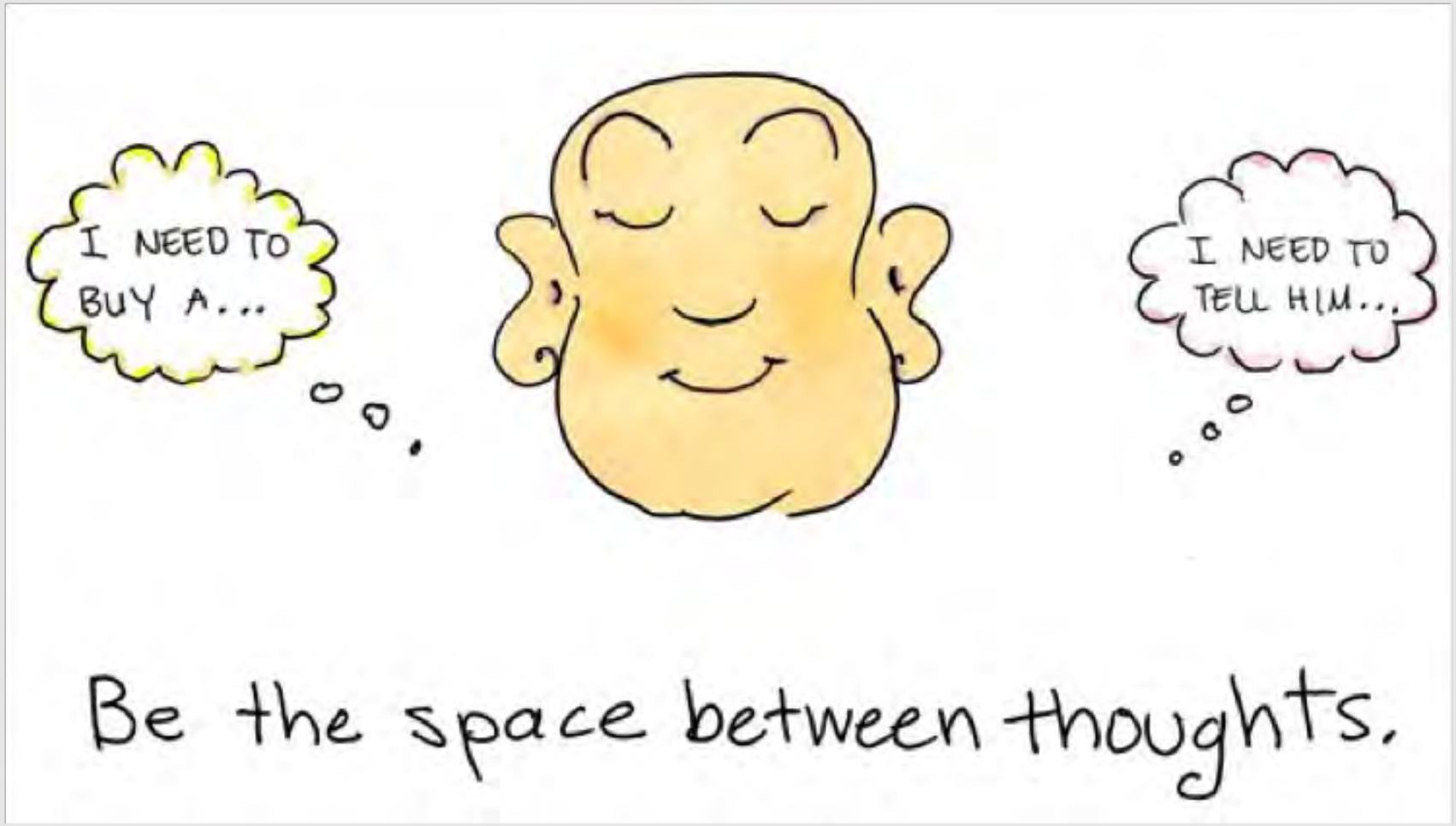
Lost in thoughts

Caught myself thinking
Back to the breath



Thoughts again :(No
progress in meditation!

Being Present



Time to Meditate

Review

- Aerobic exercise – move in some way every day!
  - Start small, working up to at least 30 minutes, 3 times per week with a long-term goal of 150 minutes of moderate intensity exercise per week.
- Posture
  - Focus on your day to day posture by working on pelvis position, setting up your work/computer environment, and practicing simple stretches and strengthening exercises.
- Yoga/meditation
  - Focus on being present, be kind to yourself when you lose focus or can't perform a pose, start small

Questions & Discussion