# The Science of Happiness: Theory and Practice

# Physical Well-Being

Pursuit of Happiness

# Sound body, sound mind

- **Keep moving**
  Regular exercise has a powerful impact on depression and well-being.
- **Reset your body clock**
  Your Circadian Rhythm, your internal body clock, is closely linked to mood.
- **Eat your way to happiness!**
  Hippocrates is famous for claiming that ”food is medicine,” and science is now showing, in spectacular fashion, that he was right.

# Keep Moving

- Wide ranging systematic reviews conclude that the impact of exercise on depression is comparable to antidepressants
- Why does regular exercise improve well-being?
  - Generates BDNF, a key hormone that promotes growth of neuroplasticity and long-term wellbeing
  - Stimulates the release of endocannabinoids, which are now thought to result in “runner’s high.”
- At least three sessions a week of moderate exercise appear to have a significant impact
  - Mixed exercise and resistance exercise seem to have the biggest effect

Pursuit of Happiness

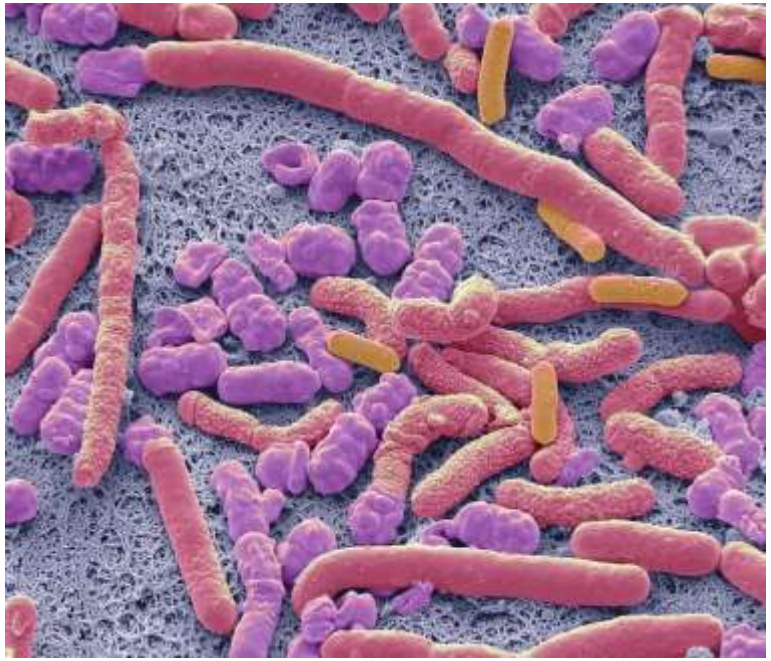
# Reset your Body Clock:
## Getting out and about


- 9 out of 10 people, at mid-Atlantic latitudes, experience changes in mood, energy, sleep, appetite and/or weight in the winter.
- At these latitudes, about 2-3% experience changes which amount to clinical Major Depression in the winter, “Seasonal Affective Disorder” or “SAD.”
- Treatment with bright light in the early morning greatly improves SAD, as well as milder symptoms in the winter.

# Reset your Body Clock:
## Outsmarting smart phones

- Circadian disruption triggers psychiatric issues
- Nighttime phone use reduces slow-wave sleep (deep sleep pattern)
- Blue light at night reduces melatonin, the hormone that maintains the sleep-wake cycle
  - Reduce screen time after dark
  - Use night shift option (changes screen color to mimic day / night color shift from blue to red)
  - Activate “Do Not Disturb” at night

# Eat your way to happiness!



## Feed your friendly bugs

- **Eat high fiber vegetables**
  Probiotic (friendly) bacteria in the human gut produce neurotransmitters (serotonin, GABA, etc.) that are key to our happiness. Probiotic bacteria thrive on high fiber vegetables
- **Eat fermented food**
  Cultured yogurt, aged cheese, kefir, olives, sauerkraut, kimchi etc, are full of probiotic bacteria. Take it step by step.

# Eat your way to happiness!

- **Eat fresh food**
  Evidence is mounting that many flavonoids, a large class of plant compounds, affect mood. Fresh vegetables and fruits, as well as tea and cocoa, are packed with flavonoids.
- **Cut down on processed food**
  Processed food is not fermented and has few flavonoids, and thus increases depression risk.
- **Soda Sadness**
  Sugar sweetened drinks are closely linked to depression, though the exact cause is still in debate

# Physical Well-being: Key Points

- **Exercise Regularly**
  - Work out at least 3 times per week (20-30 mins)
  - Mixed exercise and resistance exercise are most effective
- **Restore your Circadian Rhythms**
  - Get out and about for 20 mins as early as you can
  - Reduce screen time
  - Use night shift
- **Eat your way to Happiness**
  - Feed your friendly bacteria
  - Fill up with flavonoids
  - Fresh vegetables and fruits, as well as tea and raw cocoa, are great for your microbiome and packed with flavonoids

# Key Scientific Studies on Physical Wellbeing

## Exercise


- Endocannabinoids and Exercise: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1724924/pdf/v038p00536.pdf
- De Sousa, R., Rocha-Dias, I., de Oliveira, L., Improta-Caria, A. C., Monteiro-Junior, R. S., & Cassilhas, R. C. (2021). Molecular mechanisms of physical exercise on depression in the elderly: A systematic review. *Molecular Biology Reports*, *48*(4), 3853–3862. https://doi.org/10.1007/s11033-021-06330-z
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# Key Scientific Studies on Physical Wellbeing

## Nutrition (general)


- **The depressogenic potential of added dietary sugars**
https://pubmed.ncbi.nlm.nih.gov/31634771/
- **A combined high-sugar and high-saturated-fat dietary pattern is associated with more depressive symptoms in a multi-ethnic population**
https://pubmed.ncbi.nlm.nih.gov/28724468/
- **Role of dietary factors in the prevention and treatment for depression: an umbrella review of meta-analyses of prospective studies**
https://pubmed.ncbi.nlm.nih.gov/34531367/
- Diet and Anxiety: A Scoping Review
https://pubmed.ncbi.nlm.nih.gov/34959972/
- Martins, L. B., Braga Tibães, J. R., Sanches, M., Jacka, F., Berk, M., & Teixeira, A. L. (2021). Nutrition-based interventions for mood disorders. *Expert Review of Neurotherapeutics*, *21*(3), 303–315. https://doi.org/10.1080/14737175.2021.1881482
- Głąbska D., Guzek D., Groele B., & Gutkowska K. (2020). Fruit and vegetable intake and mental health in adults: A systematic review. *Nutrients, 12*(1), 1-34. https://doi.org/10.3390/nu12010115. PMID: 31906271; PMCID: PMC7019743.
- Vajdi, M., & Farhangi, M. A. (2020). A systematic review of the association between dietary patterns and health-related quality of life. *Health and Quality of Life Outcomes*, *18*(1):337. https://doi.org/10.1186/s12955-020-01581-z. PMID: 33046091; PMCID: PMC7552532.
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# Key Scientific Studies on Physical Wellbeing

- **Nutrition (probiotics)**
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- https://www.scientificamerican.com/article/how-gut-bacteria-tell-their-hosts-what-to-eat/

# Key Scientific Studies on Physical Wellbeing

## Circadian rhythms


- **https://pubmed.ncbi.nlm.nih.gov/31013492/**
- https://pubmed.ncbi.nlm.nih.gov/34842631/
- https://pubmed.ncbi.nlm.nih.gov/34549481/
- https://pubmed.ncbi.nlm.nih.gov/35186872/
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# Key Scientific Studies on Physical Wellbeing

**Physiological Factors (overarching)**


- Kubzansky, L. D., Huffman, J. C., Boehm, J. K., Hernandez, R., Kim, E. S., Koga, H. K., Feig, E. H., Lloyd-Jones, D. M., Seligman, M. E. P., & Labarthe, D. R. (2018). Positive psychological well-being and cardiovascular disease. *Journal of the American College of Cardiology, 72*, 1382–1396. https://doi.org/10.1016/j.jacc.2018.07.042
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