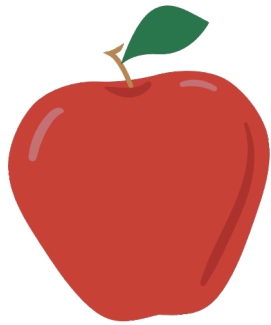
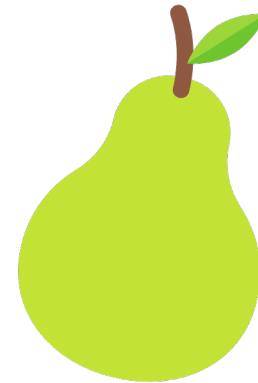


# COMPLICATIONS OF OBESITY



MICHAEL MINDRUM, MD FRCPC  
INTERNAL MEDICINE  
ASSISTANT PROFESSOR  
DALHOUSIE UNIVERSITY



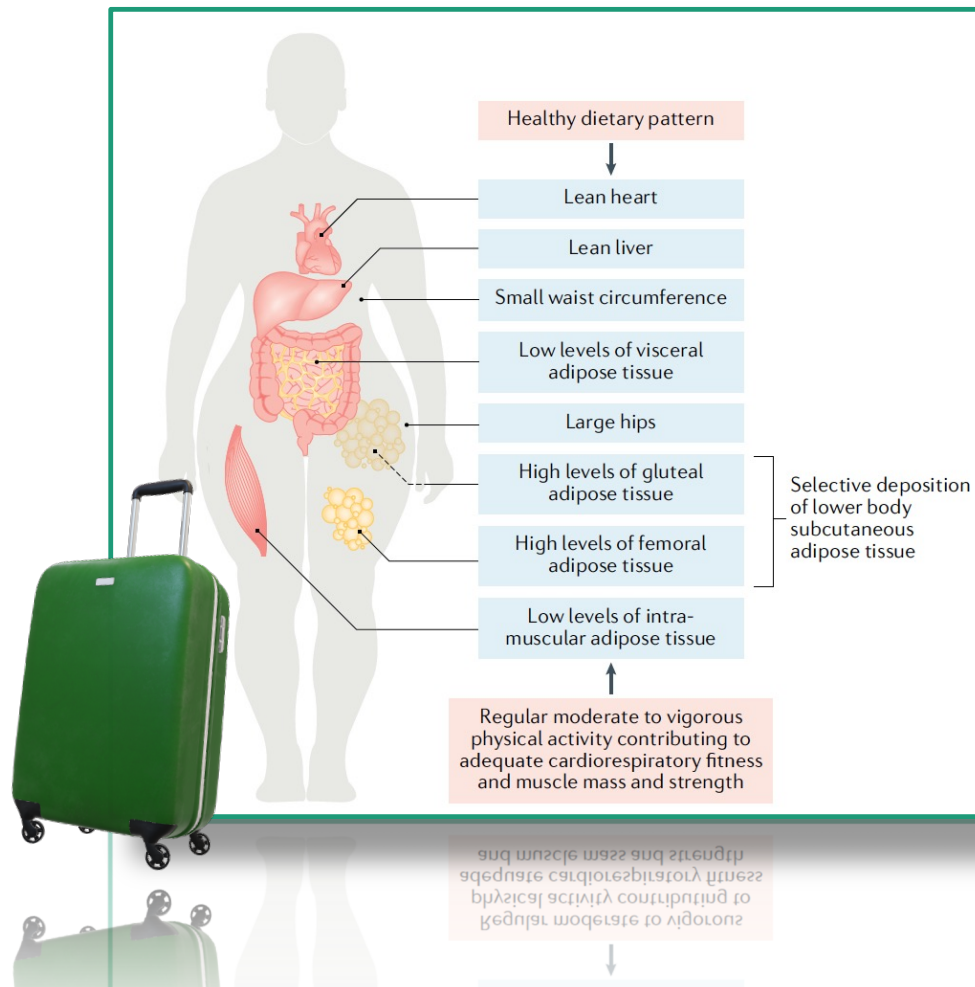
# PAUL'S EXPANDABLE SUITCASE



# OMAR'S SEMI - EXPANDABLE SUITCASE

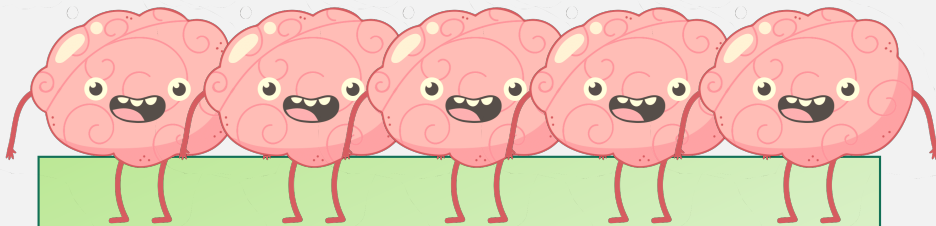


# LIVING WITH WEIGHT ~~≠~~ OBESITY



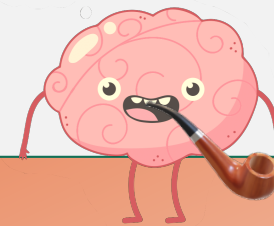


# COMPLICATIONS *of* LIVING WITH WEIGHT = OBESITY



## FAT MASS DISEASE

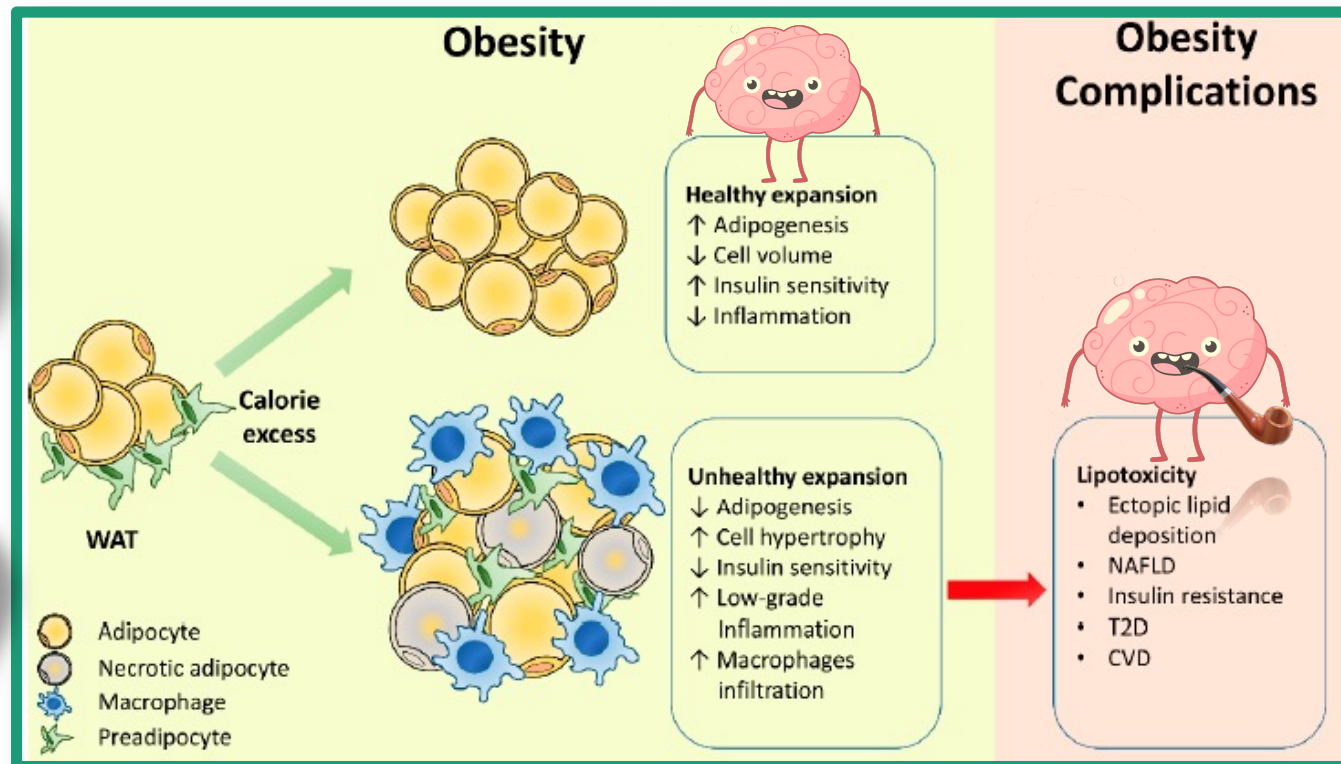
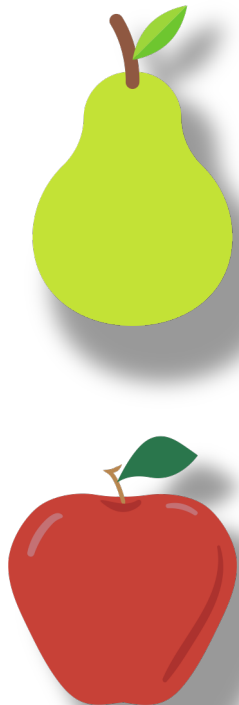
- OBSTRUCTIVE SLEEP APNEA
- OSTEOARTHRITIS

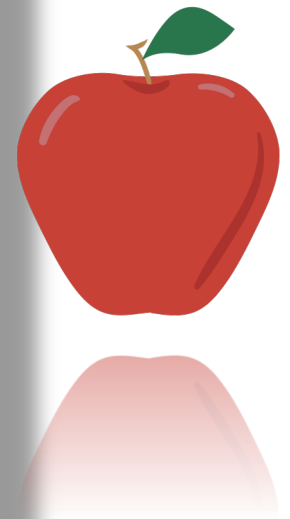
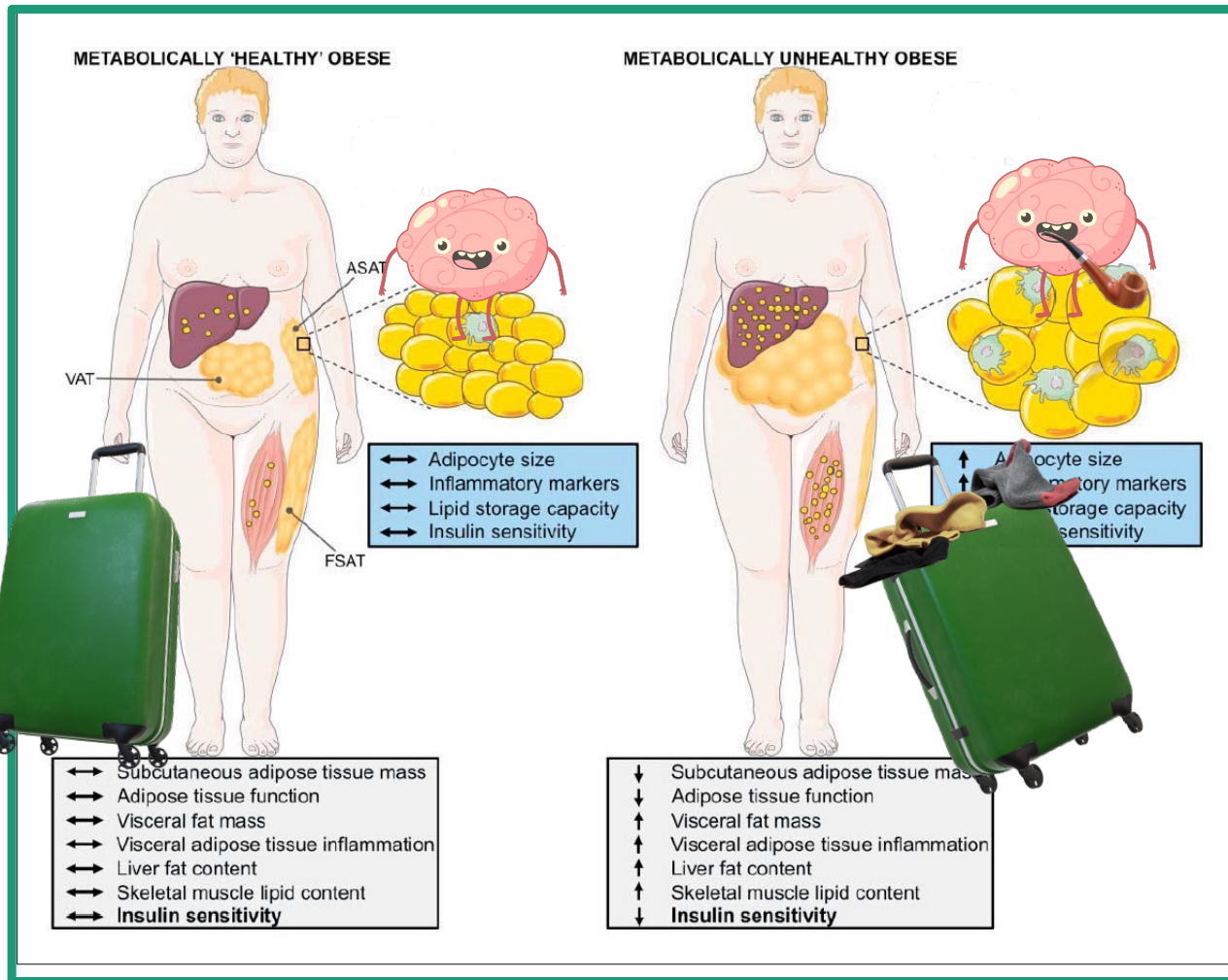
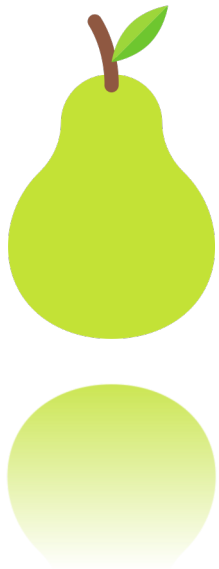


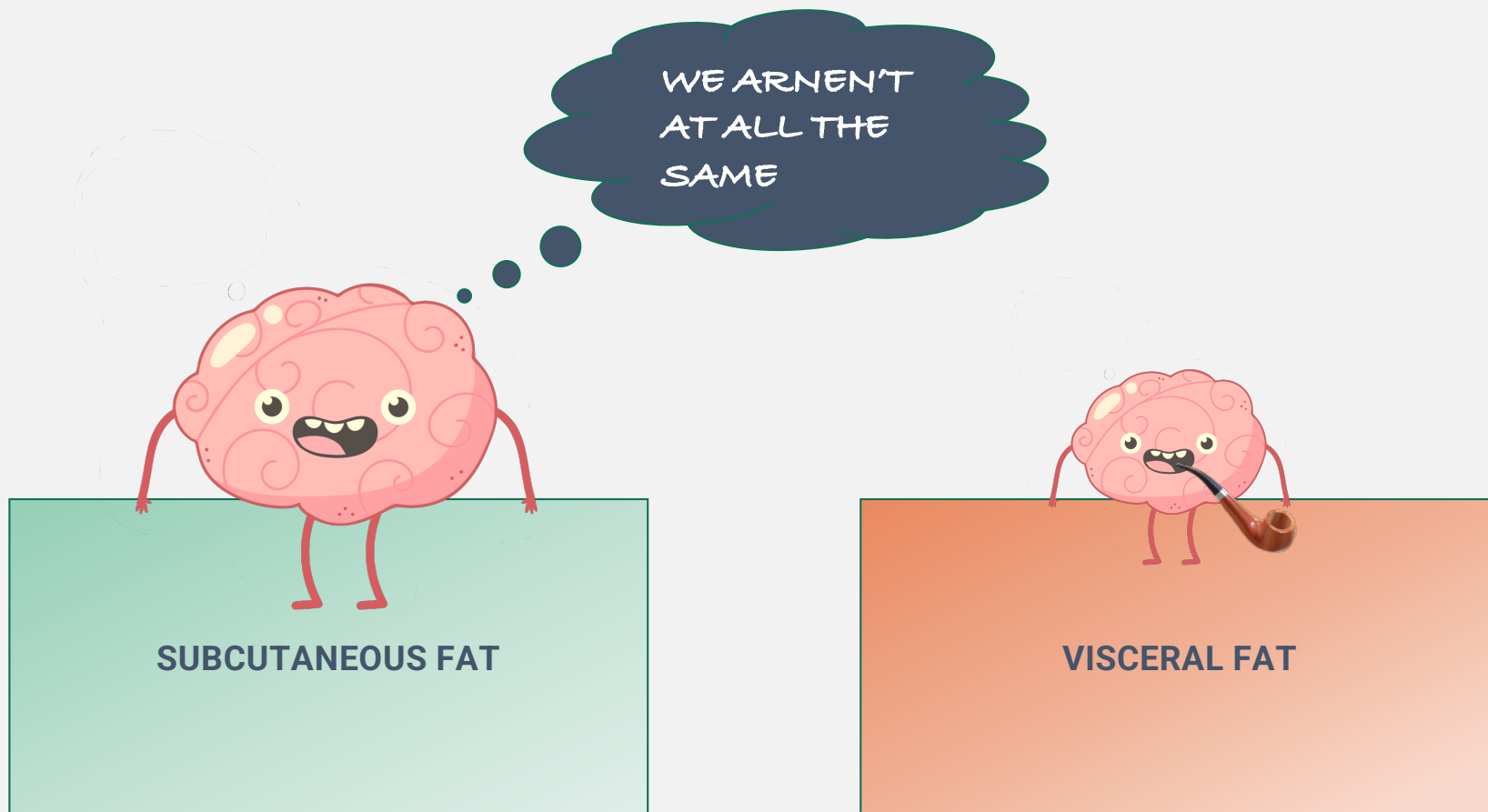
## ADIPOSOPATHY (SICK FAT)

- TYPE 2 DIABETES
- PCOS





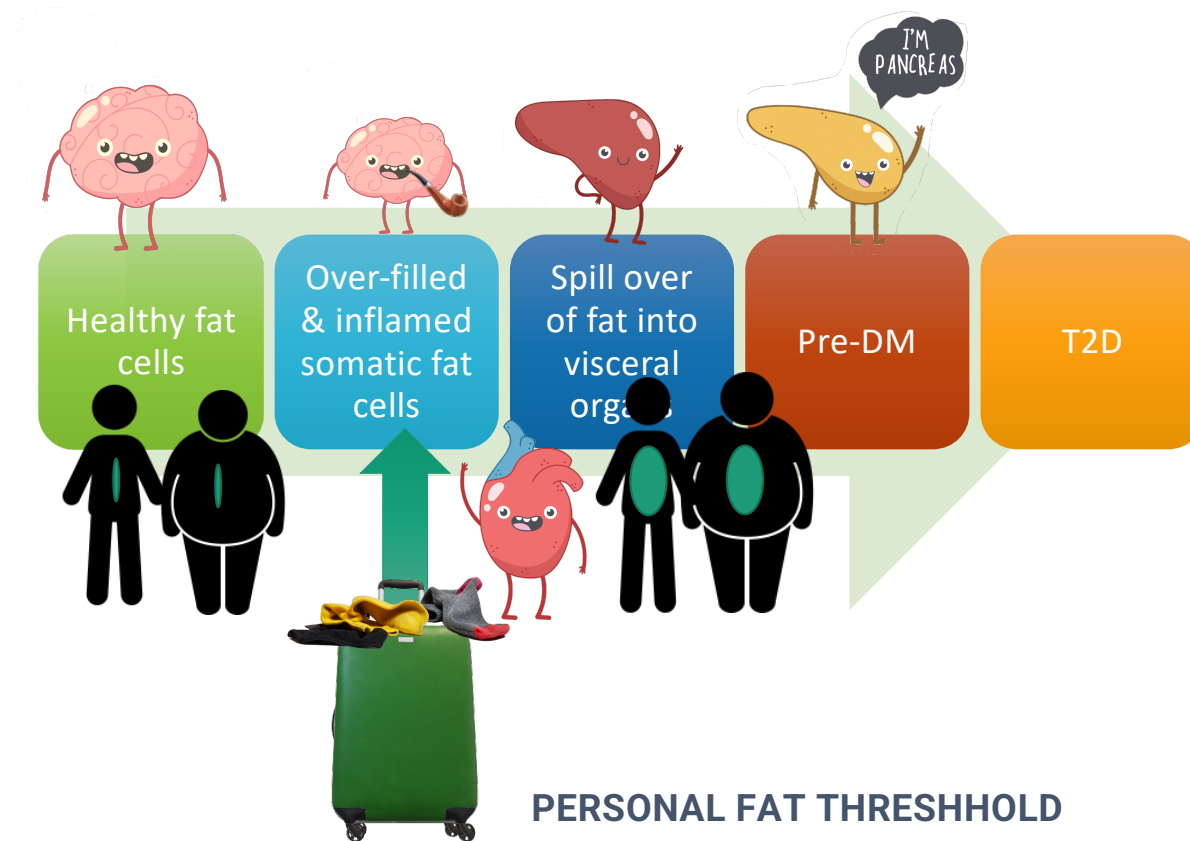




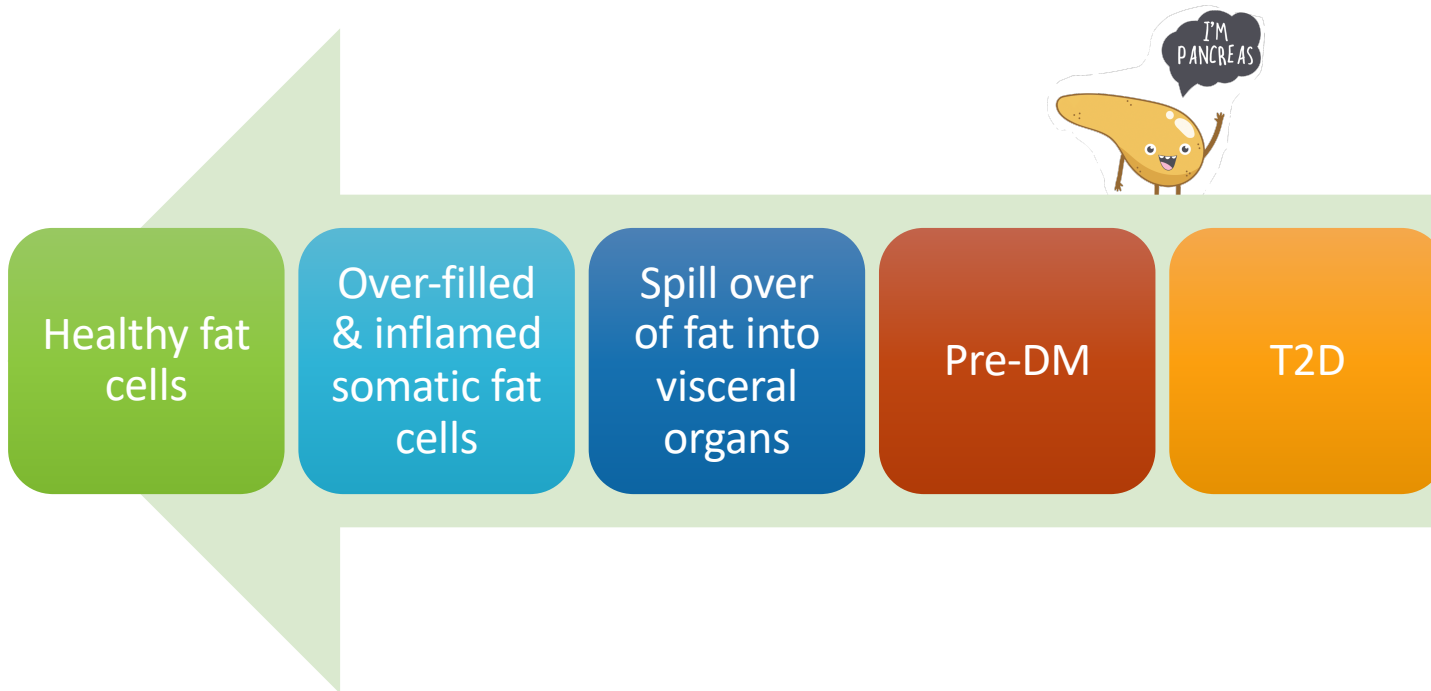
# OMAR HAS “SICK FAT” DISEASE



# TYPE 2 DIABETES AS A MODEL DISEASE OF “SICK FAT” DISEASE



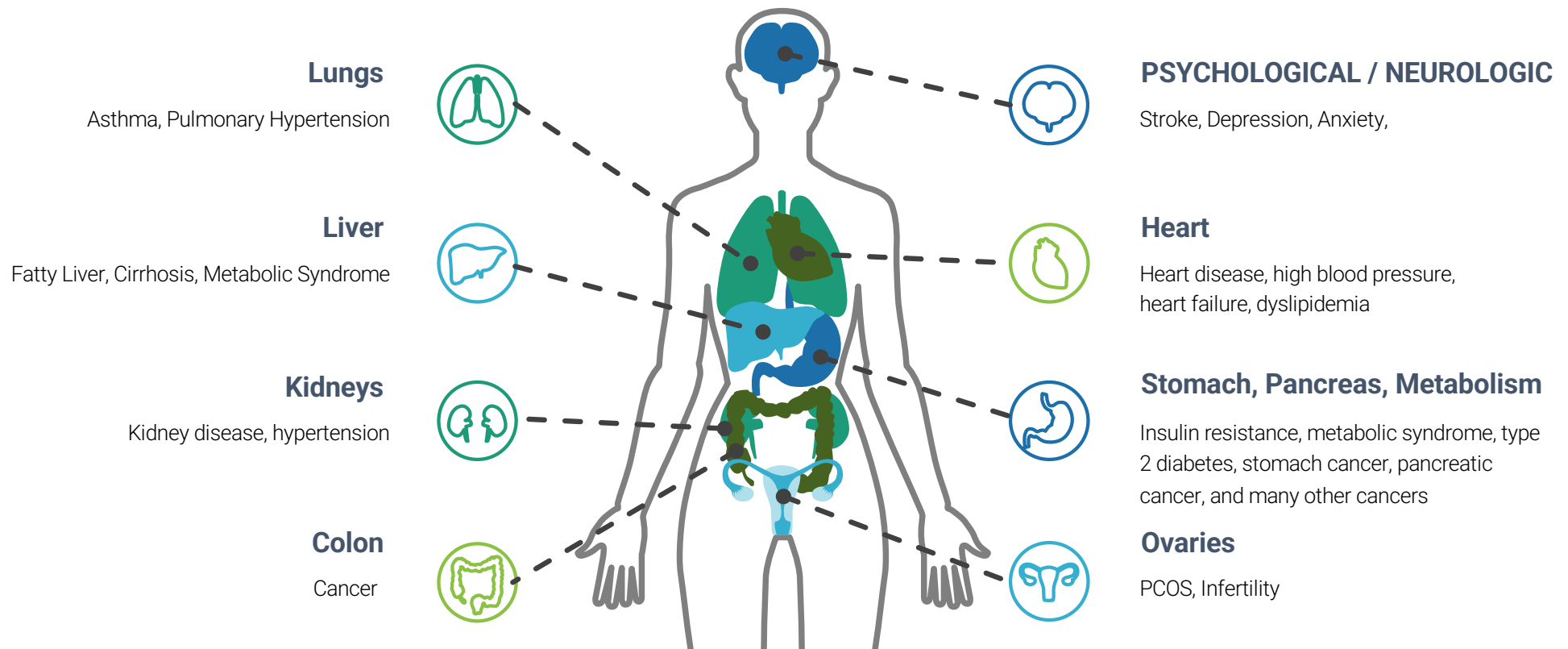
# Type 2 Diabetes Improvement



For further details see "twin cycle hypothesis" by Taylor, R., Al-Mrabeh, A., Endocrinology, N. S. T. L. D., 2019. (n.d.). Understanding the mechanisms of reversal of type 2 diabetes. *Elsevier*

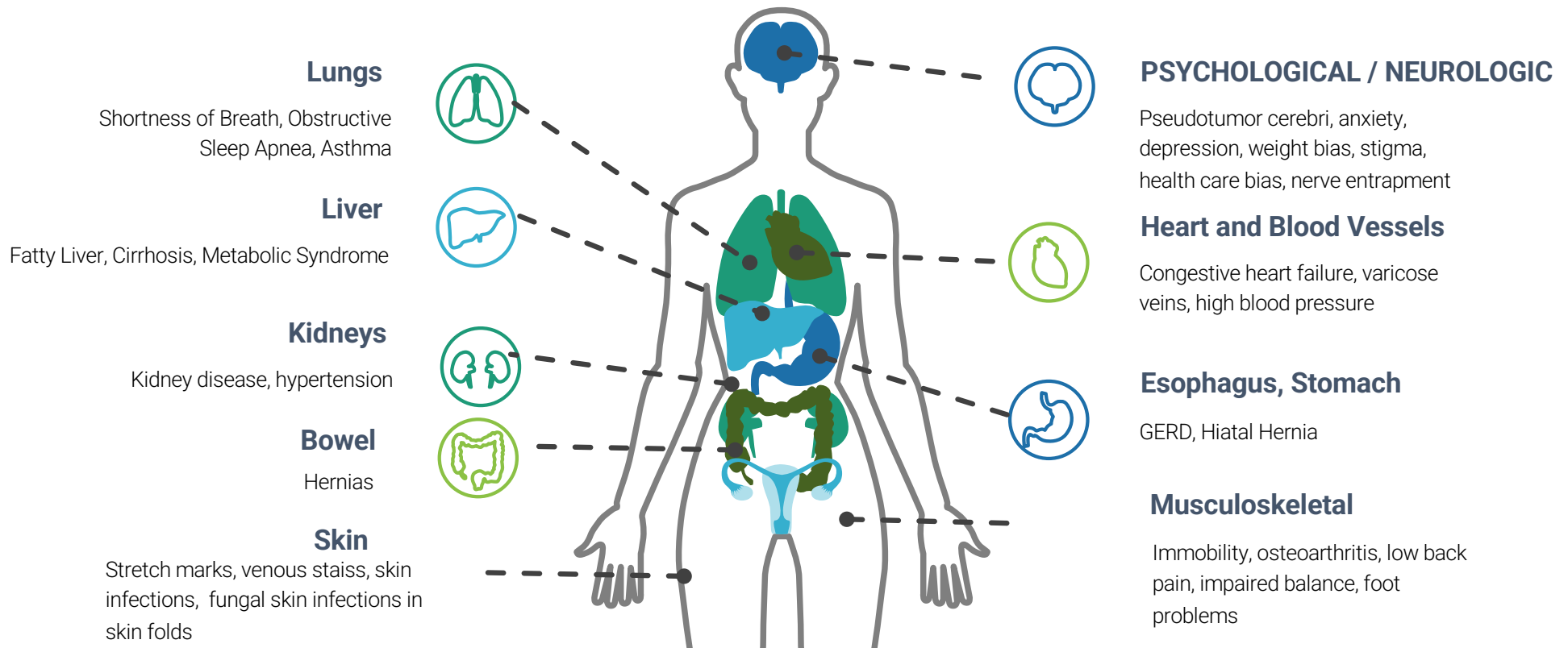


# "SICK FAT" COMPLICATIONS



1. Thompson D, et al. Lifetime health and economic consequences of obesity. *Arch Intern Med.* 1999;159(18):2177-2183. 2. Ndumele CE, et al. Weight history and subclinical myocardial damage. *Clin Chem.* 2018;64(1):201-209. 3. Fukagawa NK, et al. Effect of age on body composition and resting metabolic rate. *Am J Physiol.* 1990;259(2 Pt 1):E233-238. 4. Foster GD, et al. A randomized study on the effect of weight loss on obstructive sleep apnea among obese patients with type 2 diabetes: The Sleep AHEAD study. *Arch Intern Med.* 2009;169(17):1619-1626. 5. Kaplan LM, et al. Perceptions of barriers to effective obesity care: Results from the national ACTION study. *Obesity (Silver Spring).* 2018;26(1):61-69. 6. Whitlock G, et al. Body-mass index and cause-specific mortality in 900 000 adults: Collaborative analyses of 57 prospective studies. *Lancet.* 2009;373(9669):1083-1096.

# "FAT MASS" COMPLICATIONS



1. Thompson D, et al. Lifetime health and economic consequences of obesity. *Arch Intern Med.* 1999;159(18):2177-2183. 2. Ndumele CE, et al. Weight history and subclinical myocardial damage. *Clin Chem.* 2018;64(1):201-209. 3. Fukagawa NK, et al. Effect of age on body composition and resting metabolic rate. *Am J Physiol.* 1990;259(2 Pt 1):E233-238. 4. Foster GD, et al. A randomized study on the effect of weight loss on obstructive sleep apnea among obese patients with type 2 diabetes: The Sleep AHEAD study. *Arch Intern Med.* 2009;169(17):1619-1626. 5. Kaplan LM, et al. Perceptions of barriers to effective obesity care: Results from the national ACTION study. *Obesity (Silver Spring).* 2018;26(1):61-69. 6. Whitlock G, et al. Body-mass index and cause-specific mortality in 900 000 adults: Collaborative analyses of 57 prospective studies. *Lancet.* 2009;373(9669):1083-1096.

# WEIGHT LOSS IMPROVES COMPLICATIONS

Towards greater weight loss and overall health improvement

Shift the mindset of “lose weight” →  
“improve health and quality of life”

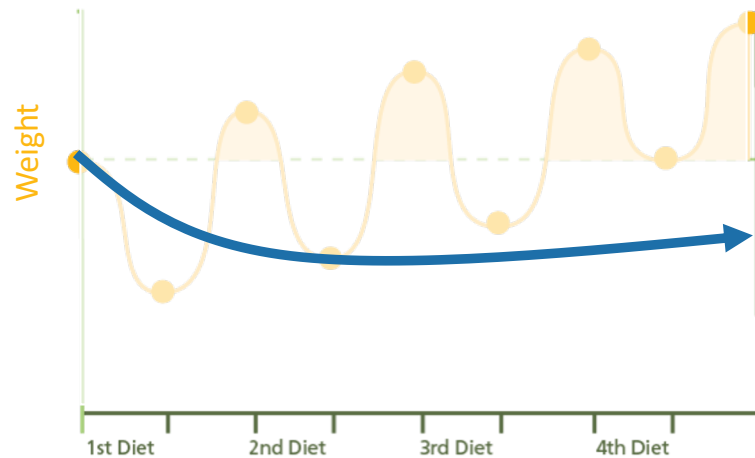


Weight loss

AD, airway disease; CVD, cardiovascular disease; Disability (pain & physical function); GERD, gastresophageal reflux disease; HFpEF, heart failure with preserved ejection fraction; HRQoL, health-related quality of life; NAFLD, non-alcoholic fatty liver disease; NASH, non-alcoholic steatohepatitis; OSA, obstructive sleep apnea; OSAS, OSA syndrome; PCOS, polycystic ovary syndrome; TG, triglycerides; T2D, type 2 diabetes mellitus.

1. Garvey WT et al. Endocr Pract 2016;22(Suppl. 3):1–203; Look AHEAD Research Group. Lancet Diabetes Endocrinol 2016;4:913–921, 2. Lean ME et al. Lancet 2018;391:541–551, 3. Benraoune F and Litwin SE. Curr Opin Cardiol 2011;26:555–561; Sundström J et al. Circulation 2017;135:1577–1585, 4. Foster et al. Arch Intern Med 2009;169:1619–26, 5. Kuna et al. Sleep 2013;36:641–9, 6. Warkentin et al. Obes Rev 2014;15:169–82, 7. Wright et al. J Health Psychol 2013;18:574–86, 8. Christensen et al. Ann Rheum Dis. 2007;66:433-9; Diabetes Prevention Program Research Group. Lancet. 2009;374:1677-86.

# Goal weight → best weight



## Best Weight

The weight a person can achieve and maintain while living the **healthiest** life they can

Aims for improved **health**

Prioritizes **worth, dignity, and self-esteem**

Involves establishing a calorie level that patients can adhere to in the long term.

Keeping lost weight off is the primary challenge of obesity management

1. Hall KD, et al. Obesity energetics: Body weight regulation and the effects of diet composition. *Gastroenterology*. 2017;152(7):1718-1727.e1713. 2. Polidori D, et al. How strongly does appetite counter weight loss? Quantification of the feedback control of human energy intake. *Obesity (Silver Spring)*. 2016;24(11):2289-2295.



## A CONTEMPLATION

Is this journey really  
about weight loss?  
Or could it be more  
about health gain,  
improved function,  
& mental well-being?

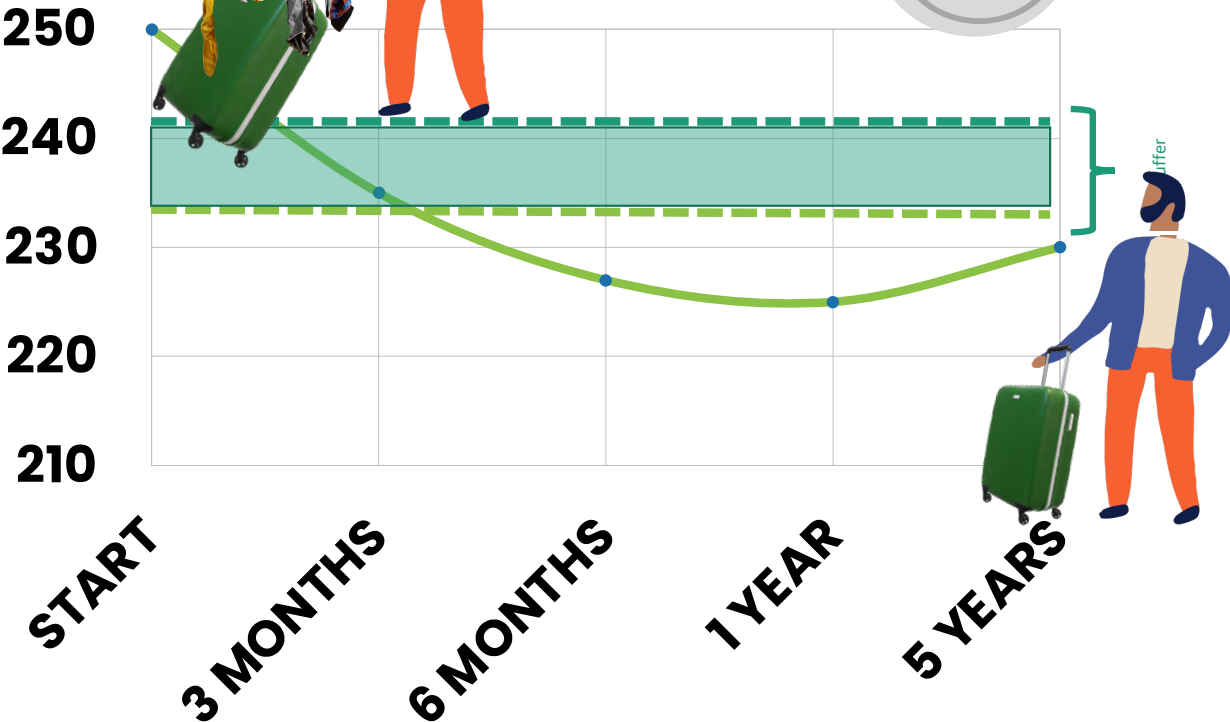
# BEST WEIGHT AND METABOLIC HEALTH

HEALTH BENEFITS OF WEIGHT LOSS

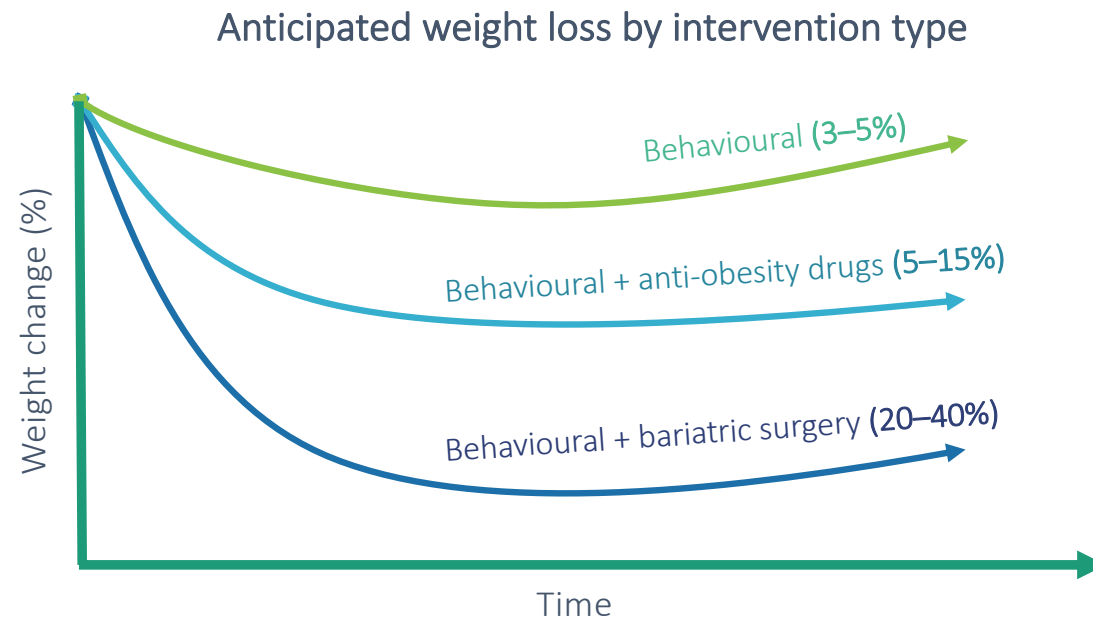


## Best Weight and Metabolic Health

- Goal weight for metabolic health
- Avg weight with lifestyle therapies



# Combining interventions leads to greater weight loss



1. Pedersen SD, et al. Canadian Adult Obesity Clinical Practice Guidelines: Pharmacotherapy in Obesity Management. Available from: <https://obesitycanada.ca/guidelines/pharmacotherapy>. Retrieved November 2020; 2. Lau DCW, Wharton S. Canadian Adult Obesity Clinical Practice Guidelines: The Science of Obesity. Available from: <https://obesitycanada.ca/guidelines/science>. Retrieved November 2020; 3. Biertho L, Hong D, Gagner M. Canadian Adult Obesity Clinical Practice Guidelines: Bariatric Surgery: Surgical Options and Outcomes. Available from: <https://obesitycanada.ca/guidelines/surgeryoptions>. Retrieved November 2020; 4. Kuk JL, Wicklum SC, Twells LK. Canadian Adult Obesity Clinical Practice Guidelines: Prevention and Harm Reduction of Obesity (Clinical Prevention). Available from: <https://obesitycanada.ca/guidelines/prevention>. Retrieved November 2020.

# APPROACHING METABOLIC HEALTH

ACHIEVING SYMPTOM RESOLUTION

- ✓ Treatment is escalated until symptom control is reached.
- ✓ Balance risks/benefits of each step
- ✓ Guided by patient preferences

