Diabetes Management

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Disclosures

- Neither of us have a financial interest/arrangement or affiliation that could be perceived as a real or apparent conflict of interest related to the content or supporters of this activity.

Objectives

- List goals of care for diabetes management
- Describe a person-centered approach to diabetes management
- Provide education on foundational knowledge for patients living with diabetes


EAST TENNESSEE STATE
UNIVERSITY
LOWE'S
One Voice. One Heart. One Beat.

Three quarters of people with diabetes live in low and middle income countries

https://www.who.int/news-room/fact-sheets/detail/diabetes
https://www.ruralhealthinfo.org/toolkits/diabetes/1/rural-concerns
https://www.worldlifeexpectancy.com/belize-diabetes-mellitus


Obesity
Lack of
Poor diet
With all of this in mind, we must remember that …
Diabetes belongs to the patient …
And we can seek to provide person-centered care
concerns
shortage
Low health
literacy

Figure 4.1—Deci M, blood glucose monitoring; BP, l ovascular disease; DSMES, diabetes self-management education and support; HF, heart failure.

https://professional.diabetes.org/standards-of-care

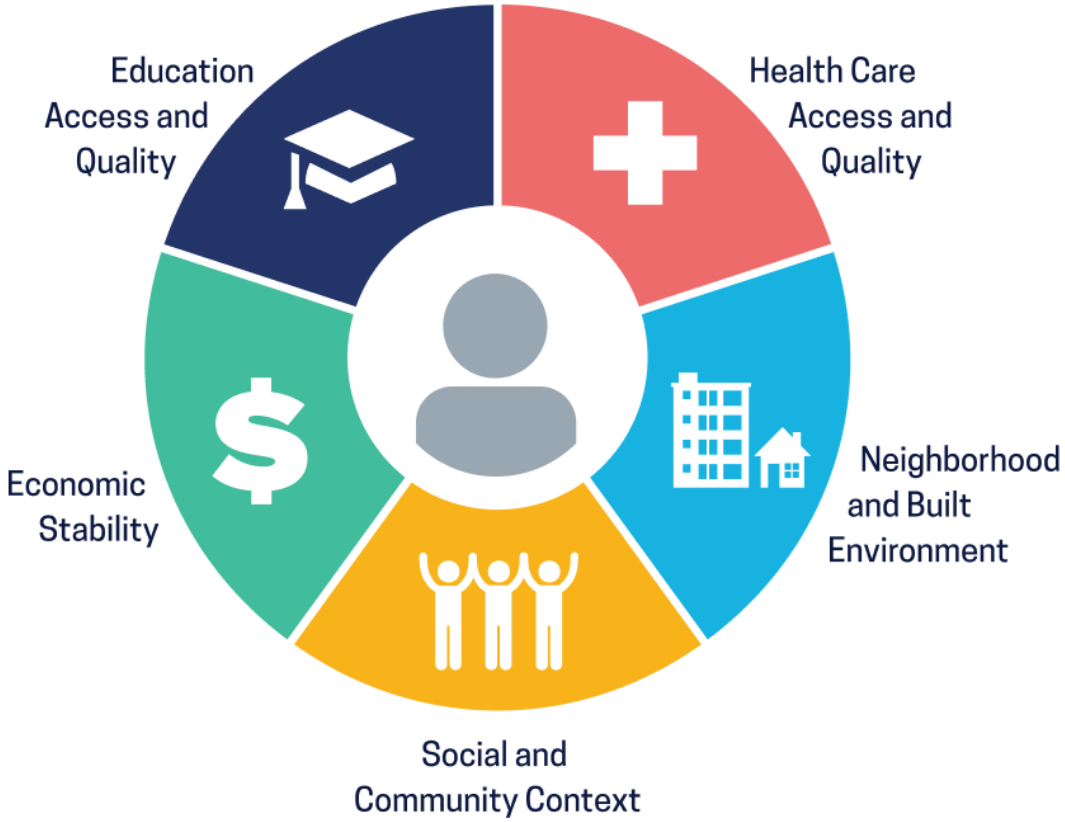
ASSESS KEY PERSON CHARACTERISTICS

- The individual's priorities
- Current lifestyle and health behaviors
- Comorbidities (i.e., CVD, CKD, HF)
- Clinical characteristics (i.e., age, A1C, weight)
- Issues such as motivation, depression, cognition
- Social determinants of health

CONSIDER SPECIFIC FACTORS THAT IMPACT CHOICE OF TREATMENT

- Individualized glycemic and weight goals
- Impact on weight, hypoglycemia, and cardiorenal protection
- Underlying physiological factors
- Side effect profiles of medications
- Complexity of regimen (i.e., frequency, mode of administration)
- Regimen choice to optimize medication use and reduce treatment discontinuation
- Access, cost, availability of medication, and lifestyle choices

Are they using any plant medicines?



https://professional.diabetes.org/standards-of-care

UTILIZE SHARED DECISION-MAKING TO CREATE A MANAGEMENT PLAN

- Ensure access to DSMES
- Involve an educated and informed person (and the individual's family/caregiver)
- Explore personal preferences
- Language matters (include person-first, strengths-based, empowering language)
- Include motivational interviewing, goal setting, and shared decision-making

AGREE ON MANAGEMENT PLAN

- Specify SMART goals:
  - **S**pecific
  - **M**easurable
  - **A**chievable
  - **R**ealistic
  - **T**ime limited

IMPLEMENT MANAGEMENT PLAN

- Ensure there is regular review; more frequent contact initially is often desirable for DSMES

https://professional.diabetes.org/standards-of-care

REVIEW AND AGREE ON MANAGEMENT PLAN

- Review management plan
- Mutually agree on changes
- Ensure agreed modification of therapy is implemented in a timely fashion to avoid therapeutic inertia
- Undertake decision cycle regularly (at least once/twice a year)
- Operate in an integrated system of care

PROVIDE ONGOING SUPPORT AND MONITORING OF:

- Emotional well-being
- Lifestyle and health behaviors
- Tolerability of medications
- Biofeedback including BGM/CGM, weight, step count, A1C, BP, lipids

https://professional.diabetes.org/standards-of-care

Person-centered approach in steps

1. Assess key person characteristics
2. Consider specific factors that impact choice of treatment
3. Utilize shared decision-making to create a management plan
4. Agree on management plan
5. Implement management plan
6. Review and agree on management plan
7. Provide ongoing support and monitoring

GOALS OF CARE

- **Prevent complications**
- **Optimize quality of life**

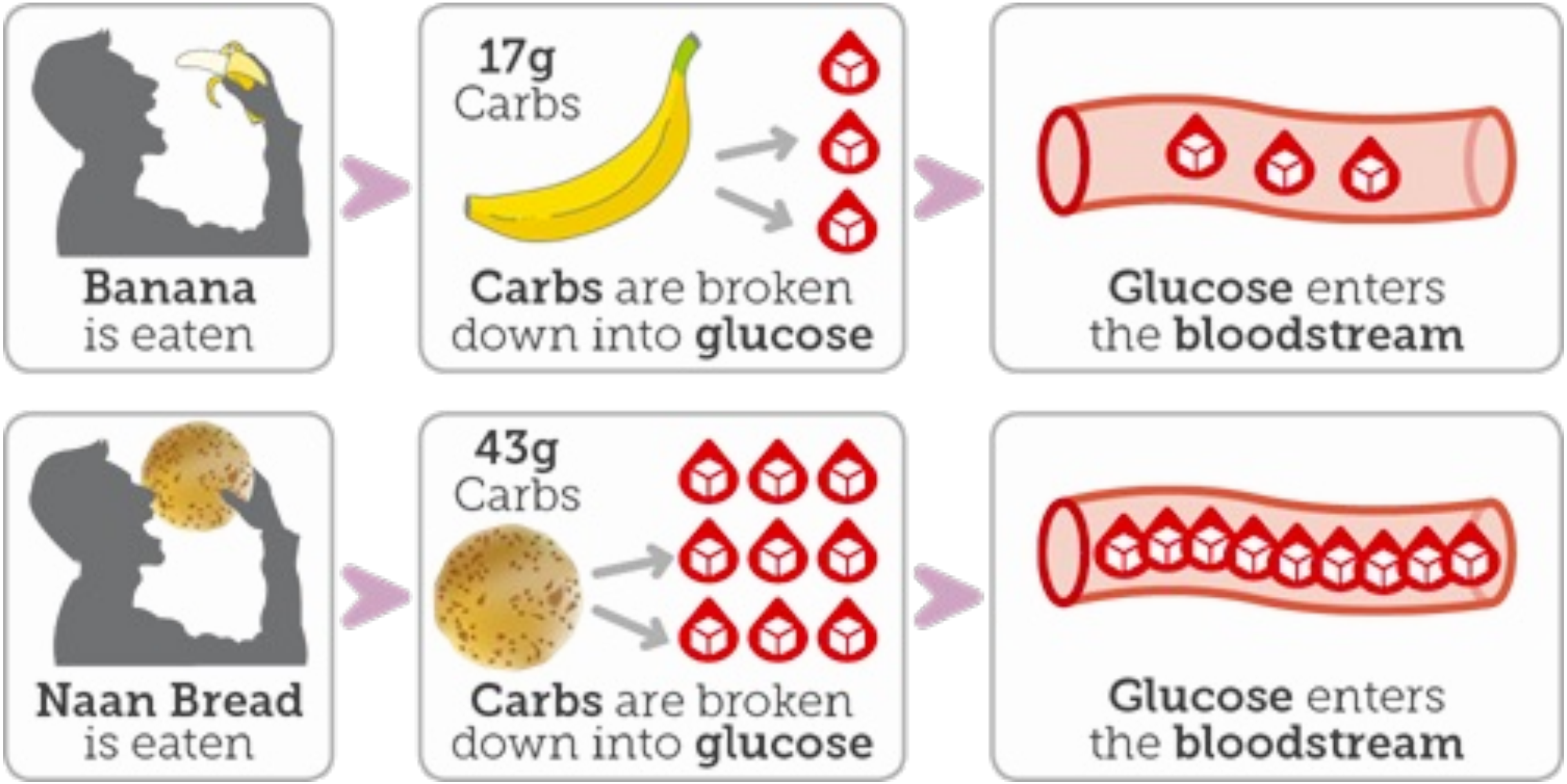
GOALS OF CARE

- Prevent complications
- Optimize quality of life

Foundational knowledge

1. What is diabetes?
2. Complication risk & prevention
3. **Nutrition**
4. **Exercise**
5. **Medications**
6. Monitoring
7. Low blood sugar management
8. Support

What is diabetes?


Banana
is eaten
17g
Carbs
Carbs are broken
down into glucose
Glucose enters
the bloodstream
Naan Bread
is eaten
43g
Carbs
Carbs are broken
down into glucose
Glucose enters
the bloodstream

1

The sugar (glucose) contained in food is absorbed into the blood-stream and carried to the liver, and then half of it is transported to the entire body.

Blood sugar level increases

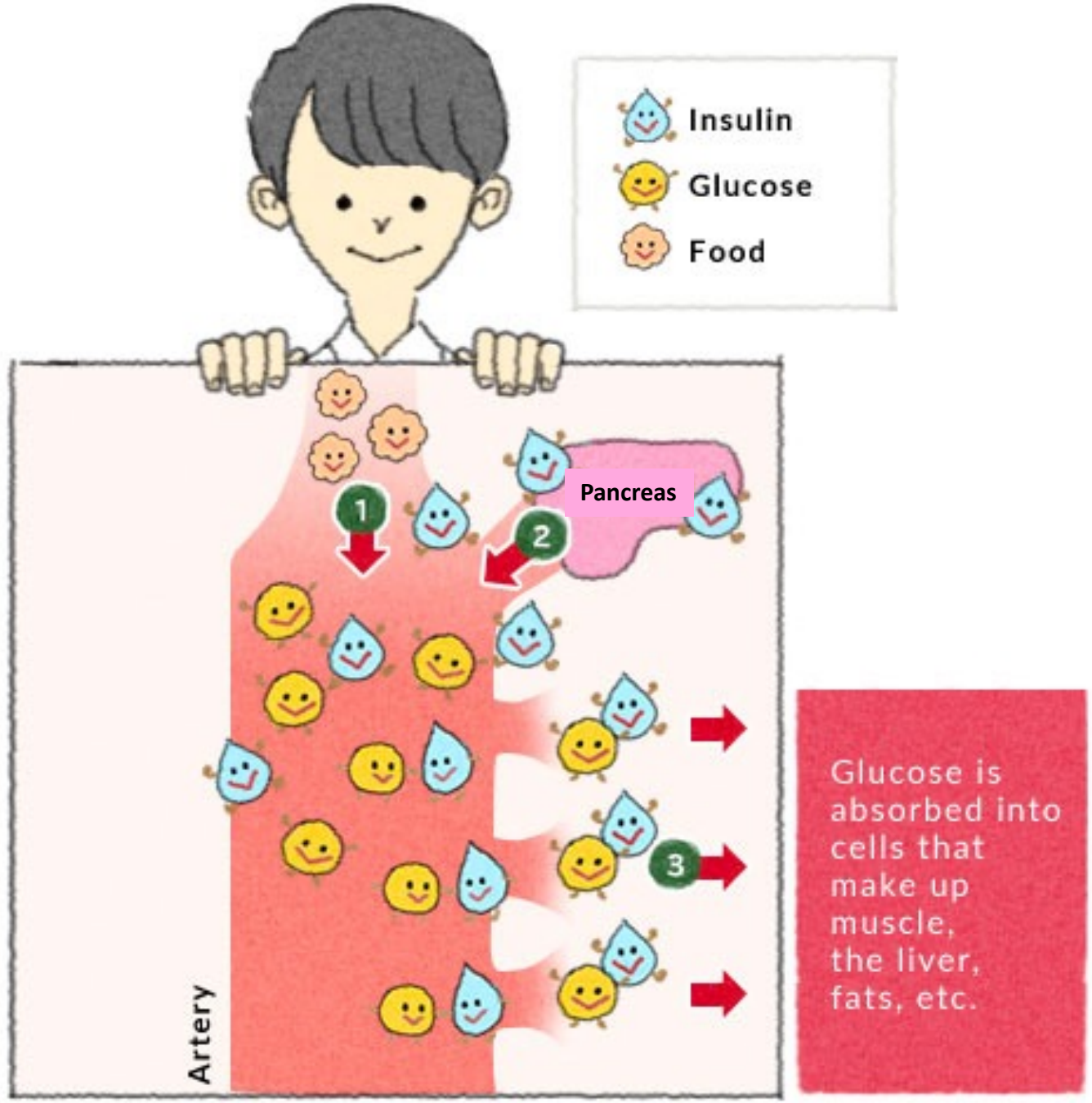
2

The pancreas releases insulin in reaction to the increase of sugar in the blood

3

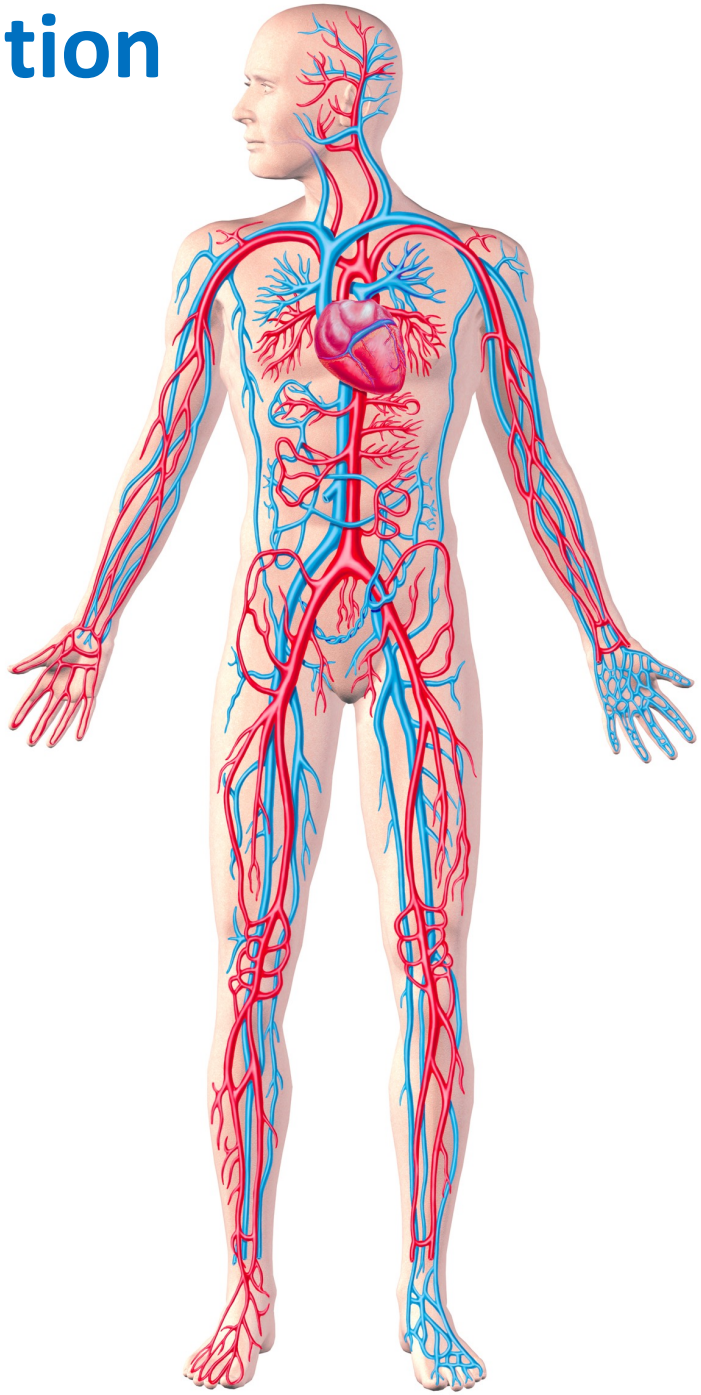
Insulin transports glucose to cells throughout the body that absorb and use it. Glucose can also be stored by insulin.

Blood sugar level then drops

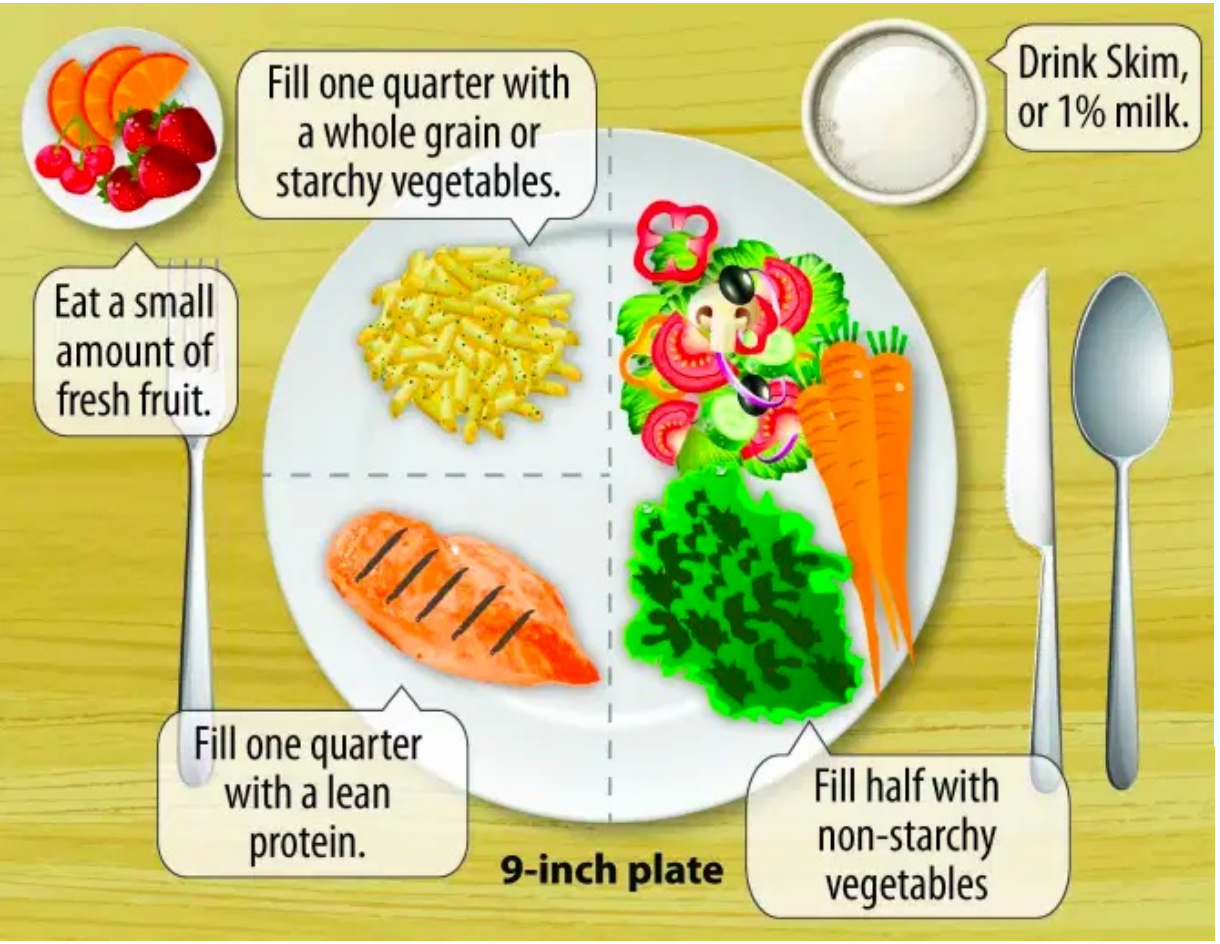


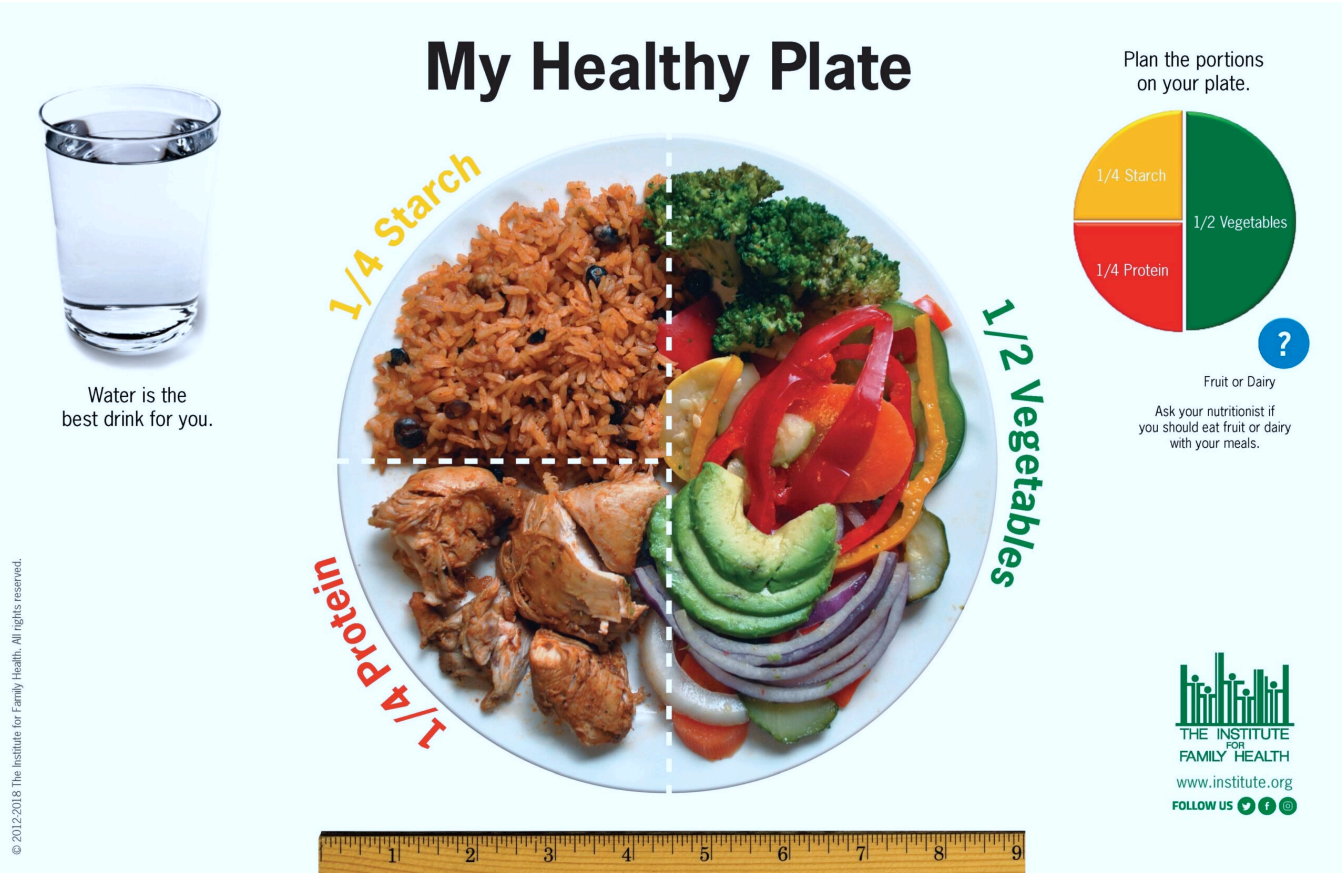
Complication risk & prevention

What part of comprehensive care & complication prevention can a variety of interprofessional team members help with?



Nutrition

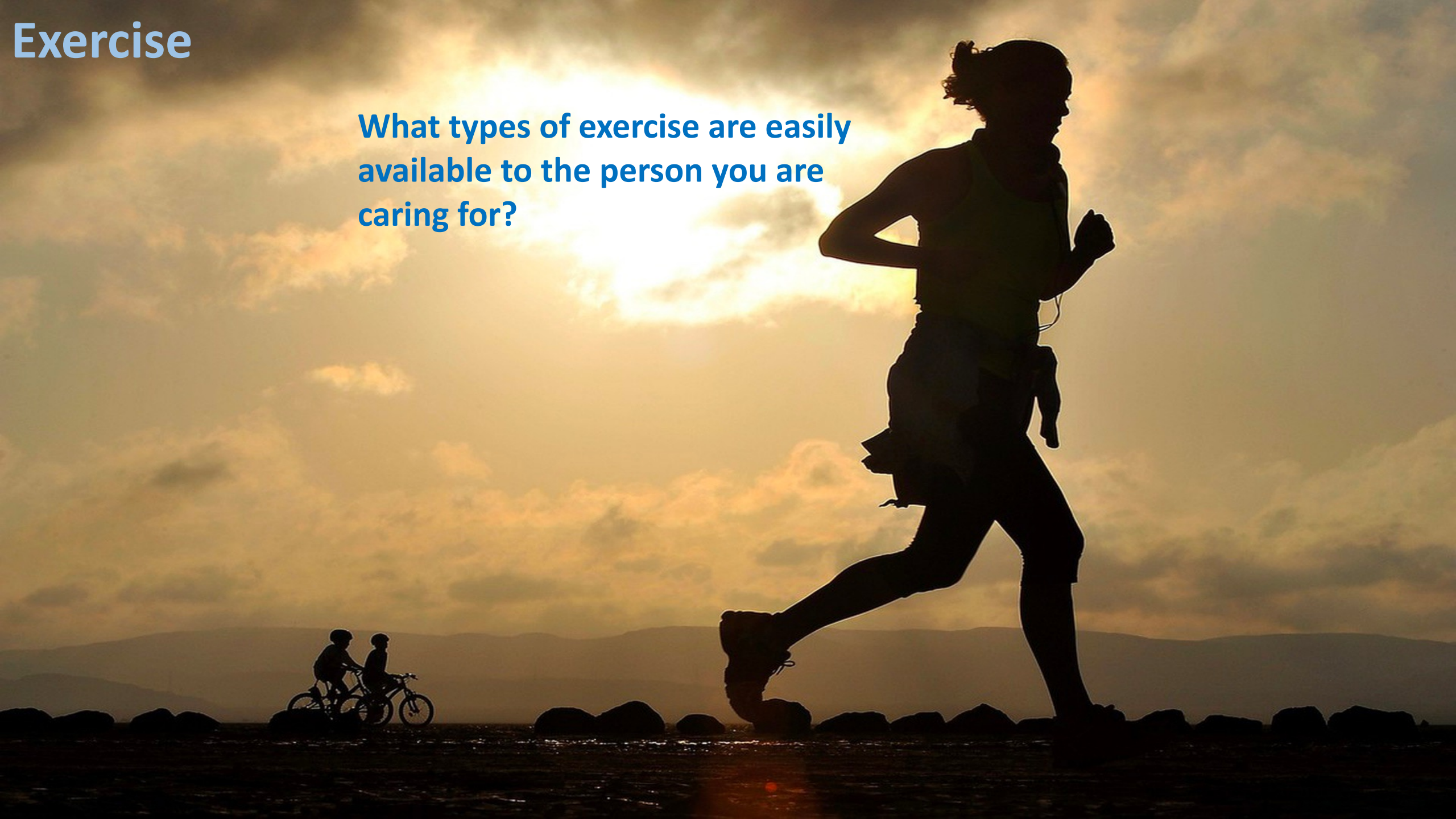




How can patients work through cost or access challenges?

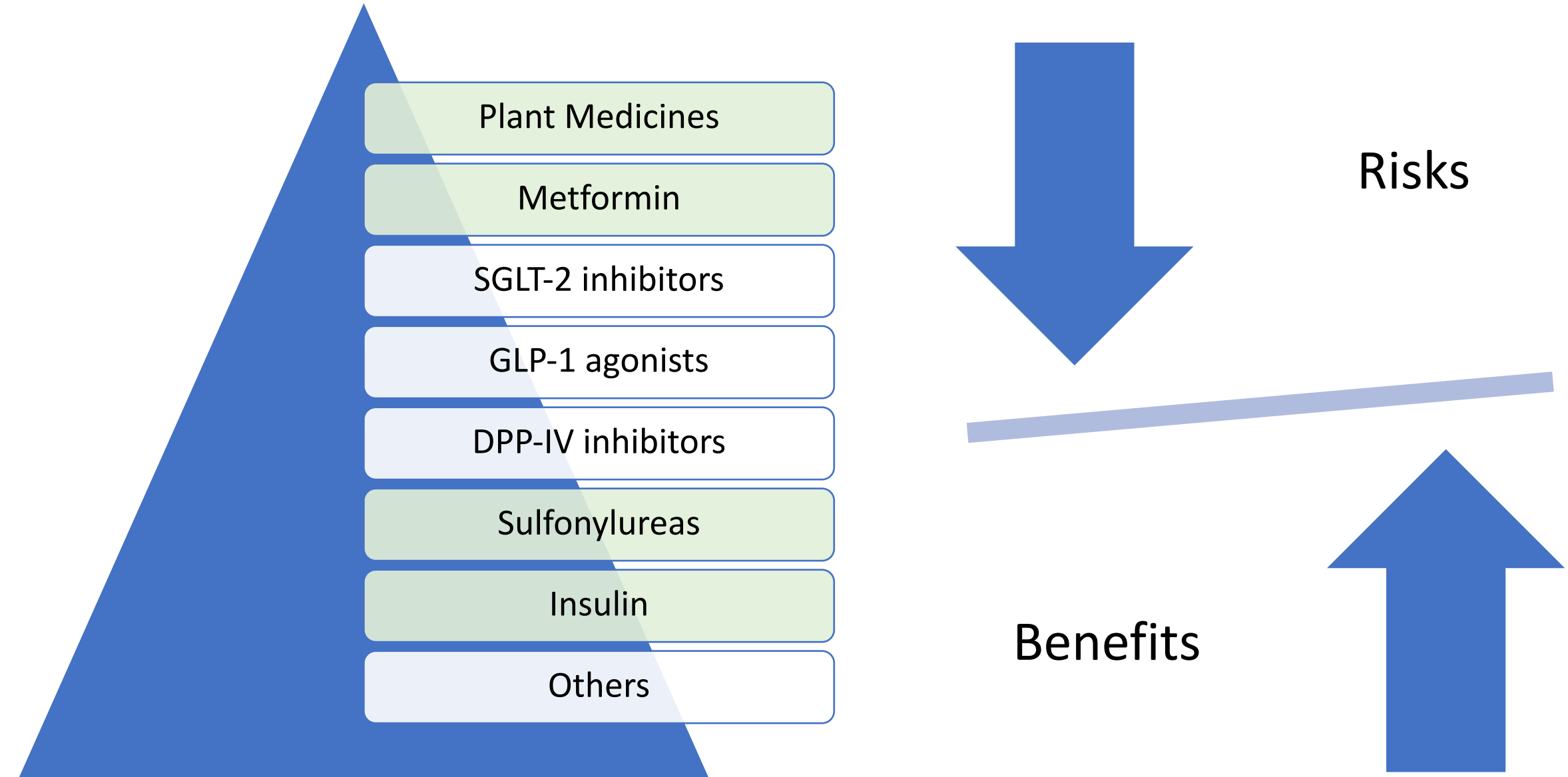
https://institute.org/health-care/services/diabetes-care/healthyplates/

Exercise



What types of exercise are easily available to the person you are caring for?

Medications


Plant Medicines
Metformin
SGLT-2 inhibitors
GLP-1 agonists
DPP-IV inhibitors
Sulfonylureas
Insulin
Others
Risks
Benefits

		Efficacy[1]	Hypoglycemia	Weight change[2]	CV effects		Renal effects		Oral/SQ	Cost	Clinical considerations
					Effect on MACE	HF	Progression of DKD	Dosing/use considerations*			
Metformin		High	No	Neutral (potential for modest loss)	Potential benefit	Neutral	Neutral	• Contraindicated with eGFR <30 mL/min per 1.73 m^2	Oral	Low	• GI side effects common; to mitigate GI side effects, consider slow dose titration, extended release formulations, and administration with food • Potential for vitamin B12 deficiency; monitor at regular intervals
Sulfonylureas (2nd generation)		High	Yes	Gain	Neutral	Neutral	Neutral	• Glyburide: generally not recommended in chronic kidney disease • Glipizide and glimepiride: initiate conservatively to avoid hypoglycemia	Oral	Low	• FDA Special Warning on increased risk of CV mortality based on studies of an older sulfonylurea (tolbutamide); glimepiride shown to be CV safe (see text) • Use with caution in persons at risk for hypoglycemia
Insulin	**Human**	High to very high	Yes	Gain	Neutral	Neutral	Neutral	• Lower insulin doses required with a decrease in eGFR; titrate per clinical response	SQ; inhaled	Low (SQ)	• Injection site reactions • Higher risk of hypoglycemia with human insulin (NPH or premixed formulations) vs. analogs
	Analogs								SQ	High	

https://diabetesjournals.org/care/article/47/Supplement_1/S158/153955/9-Pharmacologic-Approaches-to-Glycemic-Treatment

Plant Medicines

- Used by 85.7% of patients with T2DM
- Only 1 out of 30 disclose use to providers

- Benefits
  - Cultural safety
  - Locally accessible
  - Low cost

- Risks
  - Lack of disclosure
  - Unknown interactions or adverse effects

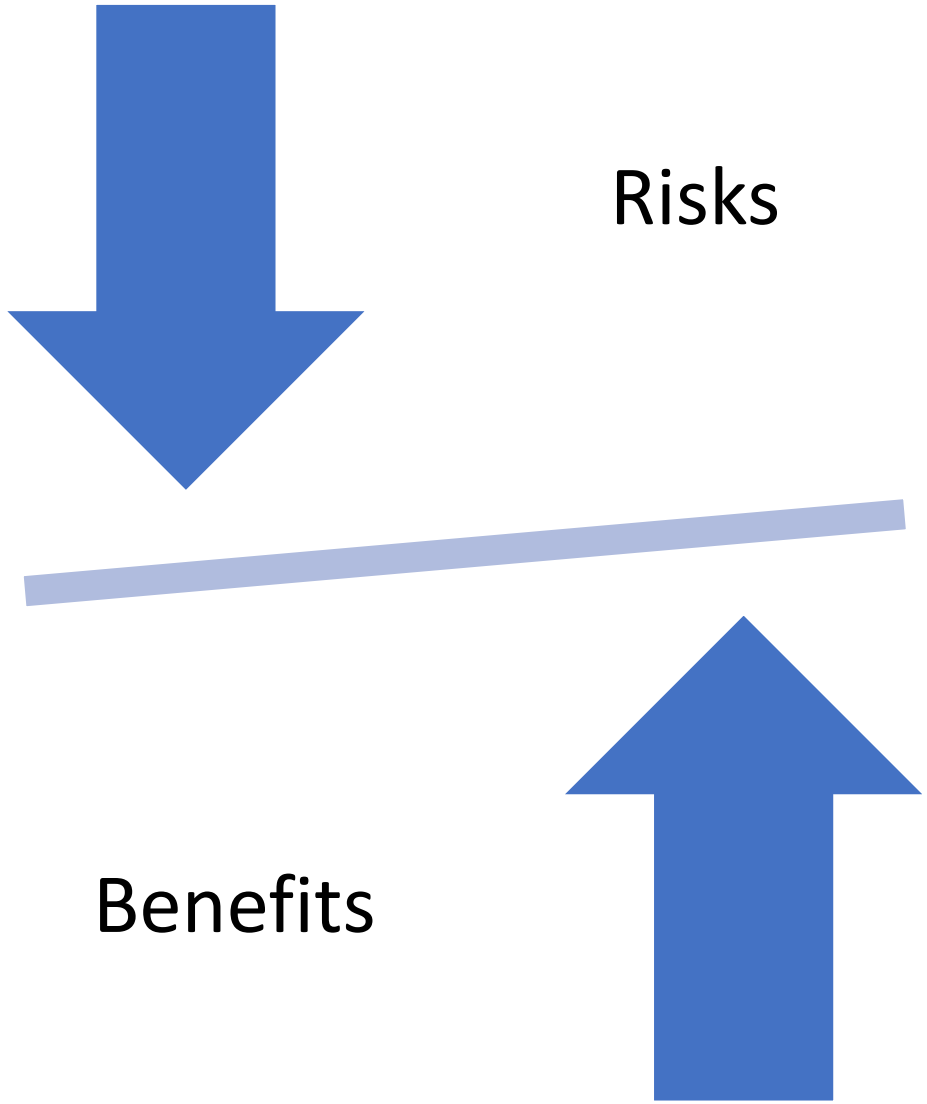


Table 2. Plants found in Belize that are used for type 2 diabetes self-management.

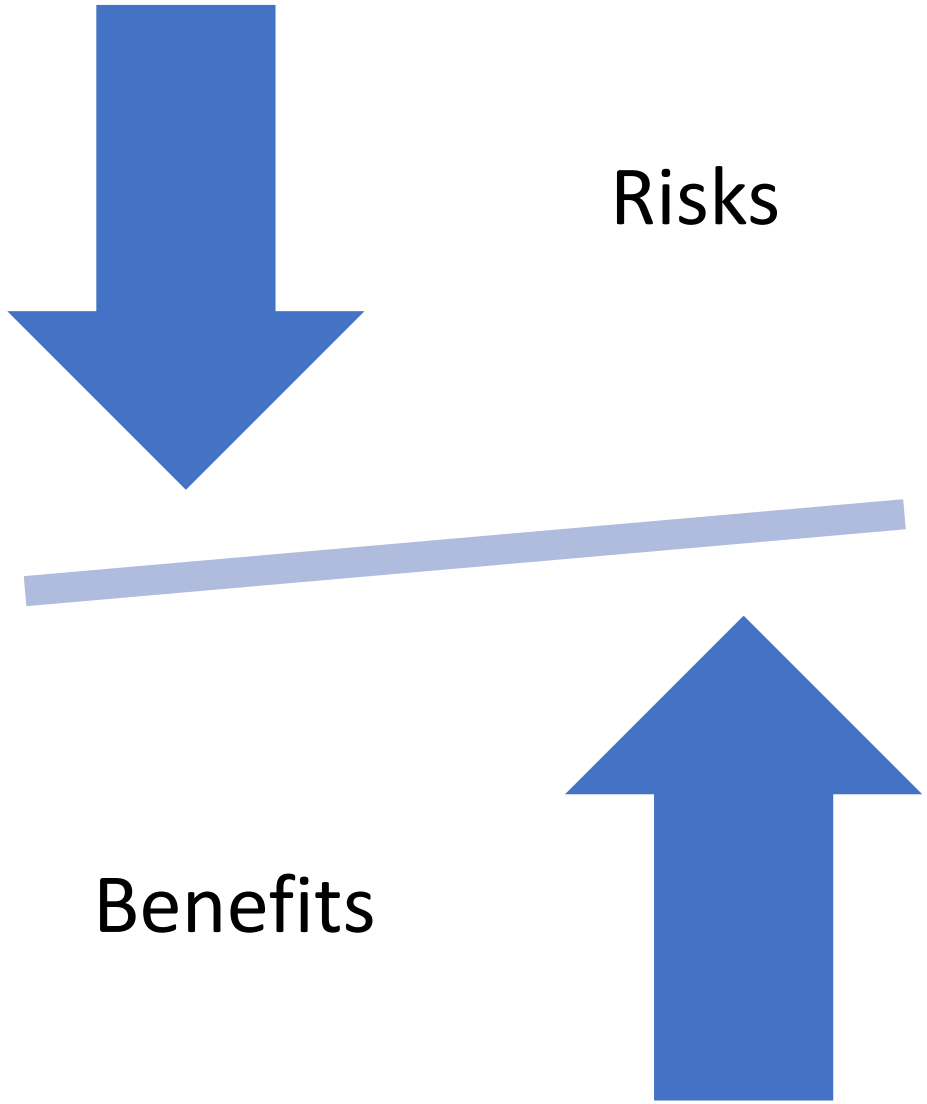
Common name	Scientific name	Part used
Aloe vera	*Aloe socotrina*	leaf
Aloe vera	*Aloe barbadensis*	leaf
Bitterbark	*Alstonia constricta*	bark
Cinnamon	*Cinnamomum zeylanicum*	bark
Coconut	*Cocos nucifera*	nut, meat, milk
Fever grass	*Cymbopogon densiflorus*	leaf
Ginger	*Zingiber officinale*	root
Gumbolimbo	*Bursera simaruba*	bark, leaf
Jackass bitters	*Neurolaena lobata*	leaf, root
Lime	*Citrus aurantifolia*	leaf, seed
Mango	*Mangifera indica*	bark, leaf
Moringa	*Moringa oleifera*	leaf
Neem	*Azadirachta indica*	bark, leaf
Noni	*Morinda citrifolia*	leaf, root
Oil nut	*Ricinus communis*	leaf, seed
Okra	*Abelmoschus esculentus*	leaf, seed
Papaya	*Carica papaya*	fruit, leaf, seed, root
Sage	*Salvia officinalis*	leaf
Sour sop	*Annona muricata*	fruit, leaf
Tumeric	*Curcuma longa*	root
Vervain	*Verbana hastat*	leaf
Vervain	*Stachytarpheta jamaicensis*	leaf

https://doi.org/10.1371/journal.pone.0289212.t002

Metformin

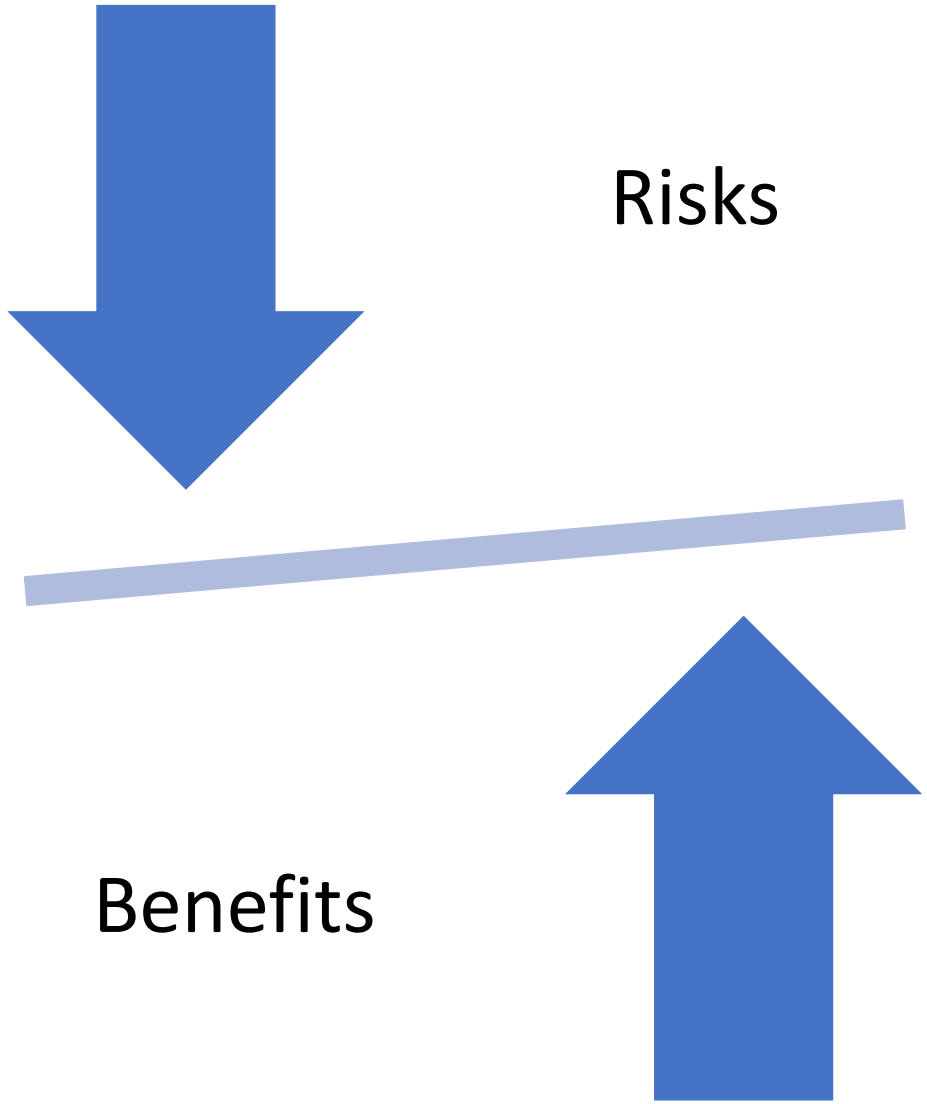
- Benefits
  - 1-2% A1c reduction
  - Morbidity/mortality benefits

- Risks
  - Gastrointestinal side effects
  - Vitamin B12 deficiency longterm
  - Contraindicated < 30 mL/min eGFR



Glibenclamide

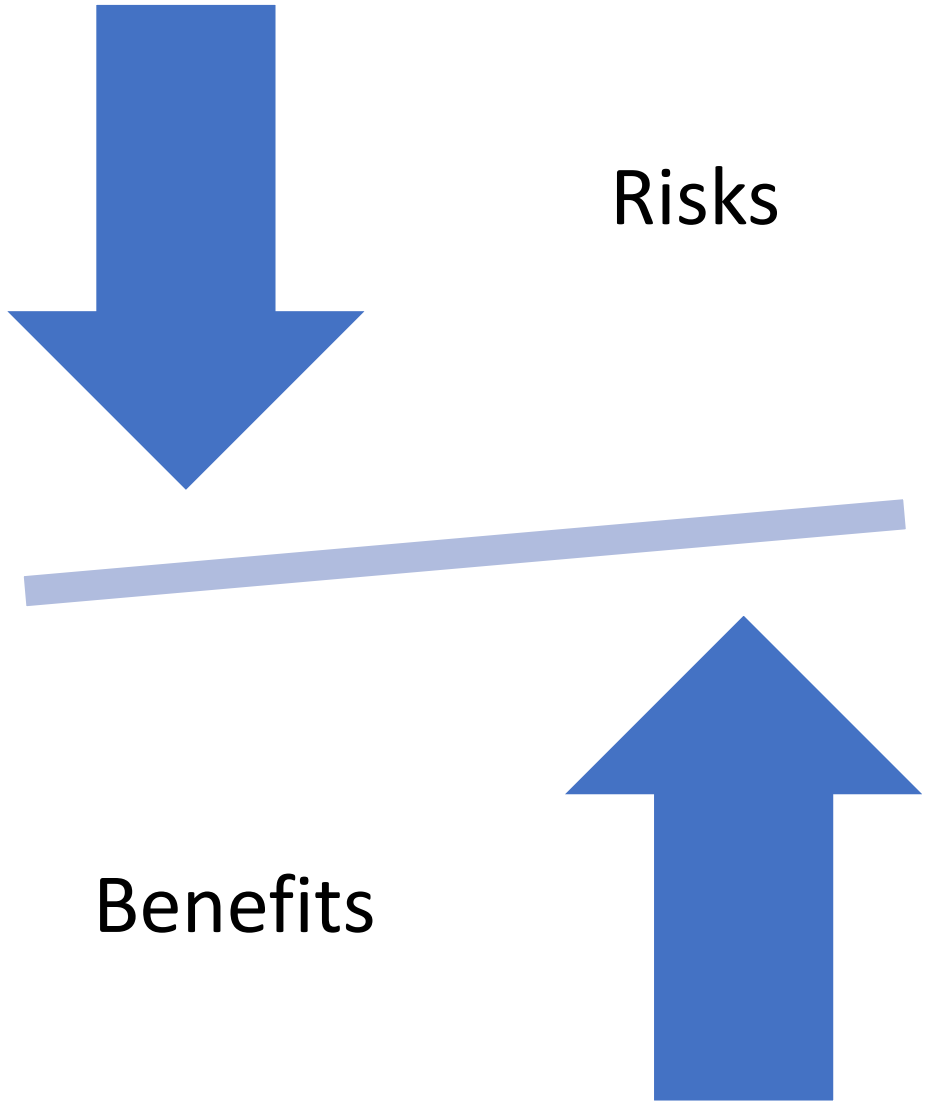
- Benefits
  - 1-2% A1c reduction
- Risks
  - Weight gain
  - Hypoglycemia
  - No morbidity/mortality
  - Secondary failure
  - Renal accumulation



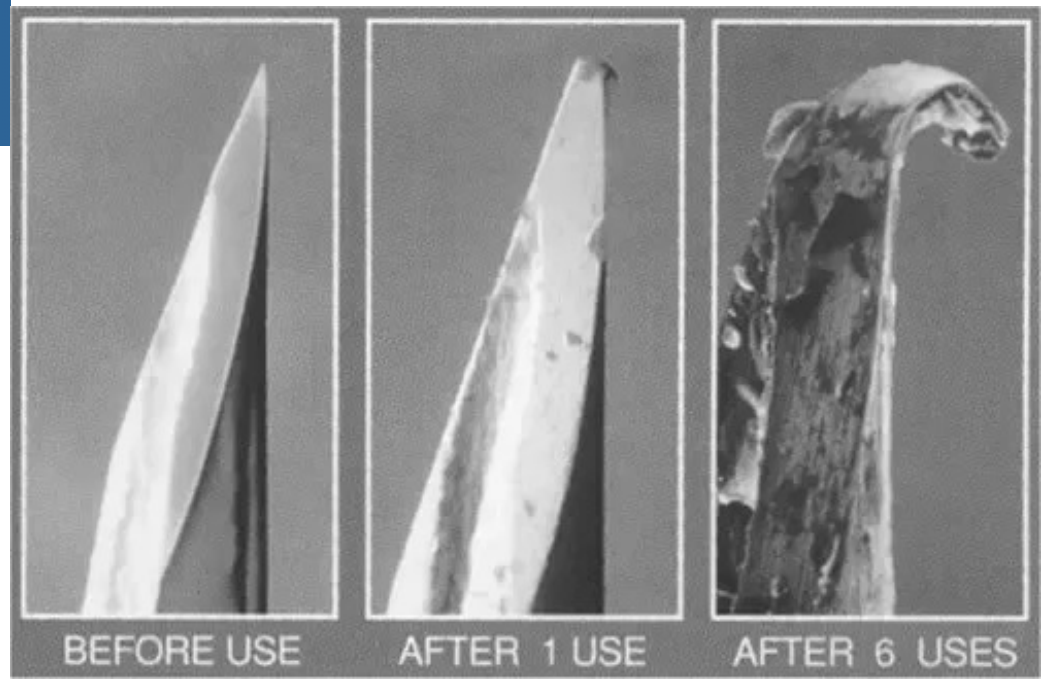
Insulin

- Benefits
  - 1-2% A1c reduction
  - Right regimen can get to goal

- Risks
  - Weight gain
  - Hypoglycemia
  - No morbidity/mortality
  - Injectable
  - Requires SMBG
  - Storage




INSULIN


BEFORE USE
AFTER 1 USE
AFTER 6 USES

Isophane

- Basal
- Cloudy

Soluble

- Bolus
- Clear

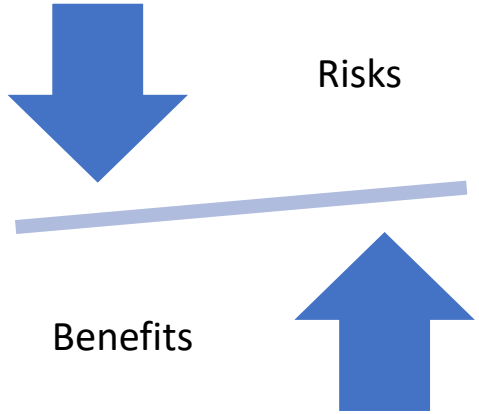
70/30

- Both
- Cloudy

Others

- Analog insulin
- SGLT2 inhibitor (Empagliflozin, etc.)
- GLP-1 receptor agonist (Dulaglutide, etc.)
- GDIP and GLP-1 RA combination (Tirzepatide, etc.)
- DPP-IV inhibitors (Sitagliptin, etc.)
- Thiazolidinediones (Pioglitazone)
- Alpha glucosidase inhibitor (Acarbose, etc.)

- Home glucose monitoring by fingerstick
- Continuous glucose monitoring (CGM)
- Continuous subcutaneous insulin infusion ("insulin pump")
- *Even more others now, historically, or to come …*



Monitoring

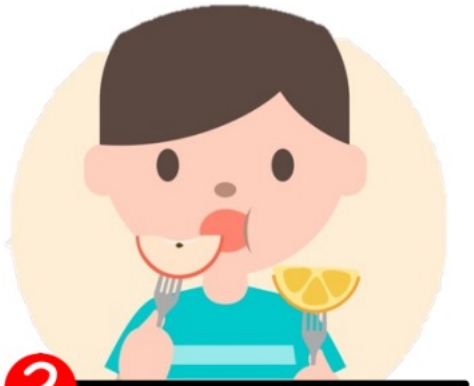
Low blood sugar management

RULE OF 15

FOR TREATING LOW BLOOD SUGAR

Your ***blood sugar may be*** **LOW** if you feel shaky, dizzy, hungry, anxious, irritable or have a fast heartbeat, blurry vision, or headache.

1. **If you feel like your blood sugar is low, check it**



2. **Blood sugar less than 70mg/dL, EAT <u>15 grams</u> of carbohydrates**

3. **WAIT <u>15 minutes</u>**

4. **CHECK blood sugar again**

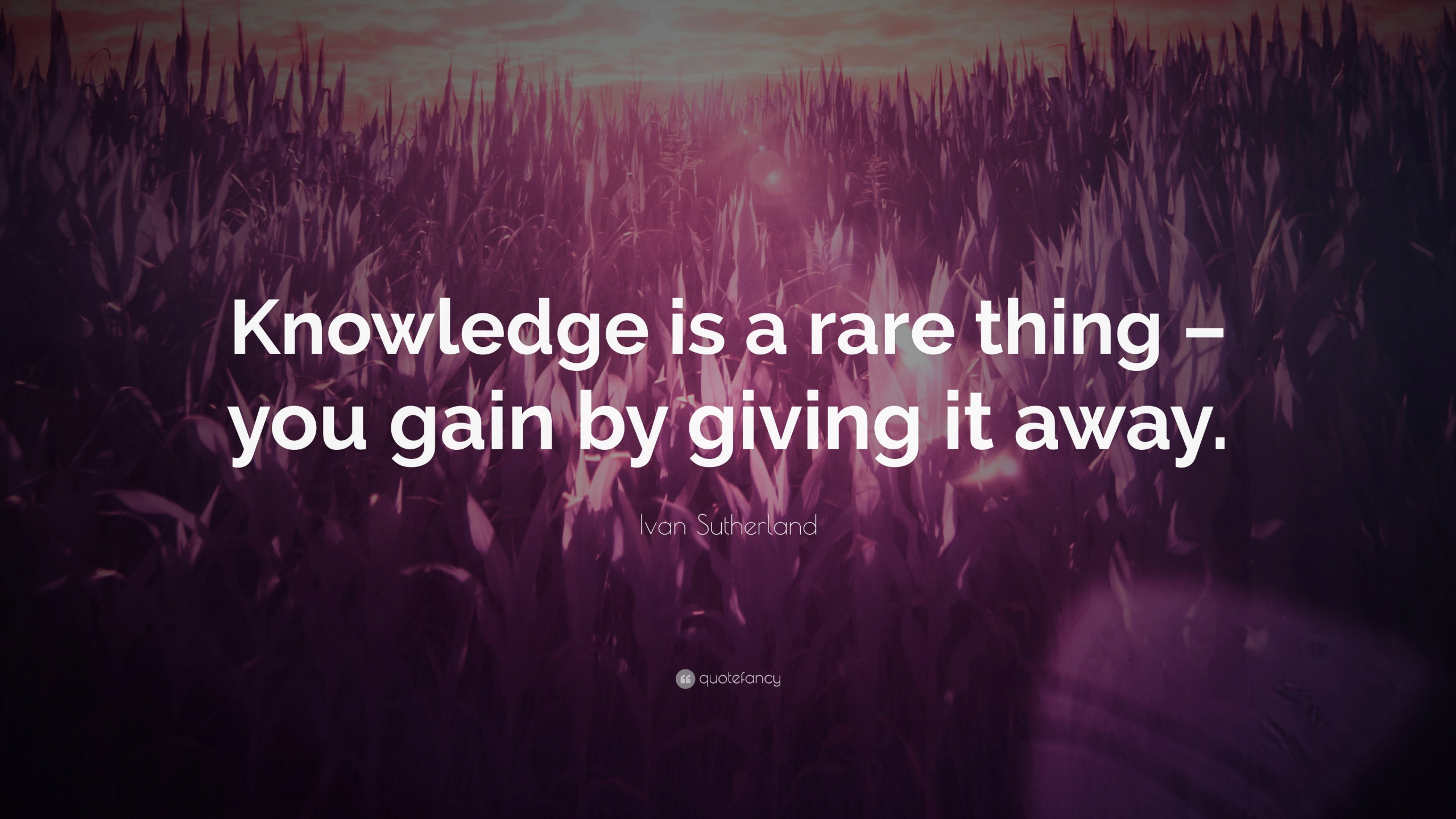
If after steps 1 2 3 4 you blood sugar reading is **STILL NOT** in NORMAL RANGE, then ***repeat*** steps 2 EAT 15 3 WAIT 15 4 CHECK.

Support


every

GOALS OF CARE

- Prevent complications
- Optimize quality of life


Knowledge is a rare thing – you gain by giving it away.
Ivan Sutherland
quotefancy

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