

Patient Version

# Personalized Post-Op Knee Recovery Protocol

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**HIP & KNEE REPLACEMENT**

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Greetings!

If you are reading this, it means you are embarking on a journey to **Regain your Mobility to Restore your Life**. No one can do this process alone, and that is why we are here for you!

Modern knee replacement requires the fine balance of expert surgical intervention, professional post-operative therapy, and a patient's devoted effort in the recovery period and beyond.

While many do well with surgery and recovery regardless of the methods used, we have collaborated on a **multi-disciplinary post-operative recovery protocol** in order to **maximize your outcome**. This guidance starts before your knee surgery during the preparatory phase, and continues into the long-term future in order to maintain a highly functional knee replacement. We have included perioperative nutrition, exercises, range of motion goals, swelling management, all in a stepwise fashion.

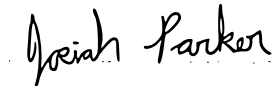
This information is based on personal experience as well as literature guidance from many leading innovators in our respective fields.

We invite you to share a copy of this with your therapist, or find printable version on the website listed below.

Remember: keep moving. Motion is life. **Motion, for life.**



Christopher Deans, MD



Josiah Parker, DPT, PT



Blake Jeffres, DPT, PT



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# Pre - Operative

## Goals – 21 Days Prior to Surgery

1. Improve strength and knee range of motion leading up to day of surgery.
2. Optimize nutrition for a safe and fast recovery.
3. Prepare body for minimizing post-operative swelling, inflammation, and pain.



### 1. Improve strength and knee range of motion.

- Perform **pre-surgical PT exercises** at home daily (see pages 2-4).
- Continue any tolerated exercises and activities.

*Especially weight training, bike, elliptical, rowing, water-based exercise, walking inclines/decline, etc.*

### 2. Optimize nutrition for a safe and fast recovery.

- Supplemental protein / essential amino acids leading up to surgery (and continued post-operatively).

*Option 1. Consume ~150mg protein per day.*

*Option 2. Consider purchase of **Enroute Complete Surgical Nutrition Program** (Attachment A).*

**\*\* special consideration for those with chronic kidney disease or other limitation to high protein consumption. Please let your provider know if this is the case for alternative options.**



### 3. Prepare body for minimizing post-operative swelling, inflammation, and pain.

- Adopt an **anti-inflammatory diet**, such as the *Mediterranean diet* leading up to surgery and continued at least 6 weeks after surgery (Attachments B, C).
- Purchase **Nature's Craft Diosmin + Hesperidin** (Attachment D).  
Take twice daily 7 days prior to surgery, 21 days after surgery.






## Clinician Notes

Modify or stop if pain occurs. Contact your physical therapist or orthopedic surgeon to help modify if needed.

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## Single Leg Knee Extension with Weight Machine

REPS: 10-15	SETS: 3	DAILY: 1	WEEKLY: 3-4
			

### Setup

Begin by sitting on the seat of the machine, placing your feet underneath the roller pad. Adjust the pin to your desired weight. Check that the seat is in the correct position. Your knees should bend right at the edge of the seat. If you can adjust the roller pad, make sure it rests just above your ankles.

### Movement



Engage the muscles in the front of your thigh to lift the roller pad up with one foot, straightening your leg, then slowly reverse the movement, and repeat.

### Tip

Make sure to keep your movements slow and controlled. Do not let your knees lock during the exercise.

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## Single Leg Press

REPS: 10-15	SETS: 3	DAILY: 1	WEEKLY: 3-4
			

### Setup

Begin by loading the machine with your desired amount of weight. Sit on the seat of the machine with your back flat against the back rest. Firmly plant both feet on the foot platform so that your feet are hip width apart or slightly wider. To unlock the machine, push up on the platform and pull the lever by your side towards you.

### Movement

Remove one leg from the foot platform. Bring your knee toward your chest to slowly lower the weight as far as you can while keeping your hips against the seat. Then press up into your foot to straighten your leg without locking your knee, and repeat.

### Tip

Make sure to keep your movements slow and controlled. Do not let your knee collapse inward or move forward past your toes during the exercise. Remember to engage the platform lock when you are finished.

## Single Leg Hamstring Curl with Weight Machine

REPS: 10-15

SETS: 3

DAILY: 1

WEEKLY: 3-4



### Setup

Begin by sitting on the seat of the machine, placing one foot between the two roller pads. Adjust the pin to your desired weight. Check that the seat is in the correct position. The lower roller pad should be resting slightly above your heel. If needed, adjust the lever at your side so that you start with your feet lifted.

### Movement

Engage the muscles in the back of your thigh to press down the bottom roller pad, curling your heel toward the floor. Slowly reverse the movement and repeat.

### Tip

Make sure to keep your movements slow and controlled. Do not let your knee lock during the exercise.

## Step Up

REPS: 10-15

SETS: 3

DAILY: 1

WEEKLY: 3-4



### Setup

Begin standing with a small step or platform in front of you.

### Movement

Step up onto the platform with one foot then follow with your other foot. Return back down to the starting position and repeat.

### Tip

Make sure to maintain good posture during the exercise and do not let your knee bend forward past your toe as you step up.

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## Forward Step Down

REPS: 10-15

SETS: 3

DAILY: 1

WEEKLY: 3-4



### Setup

Begin standing on a step with your hands on your hips.

### Movement

Balance on one leg and lower your other leg forward off the step to the floor. Lightly touch the floor with your heel then return to the starting position and repeat.

### Tip

Make sure to maintain your balance during the exercise and do not let your knee collapse inward.

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## Sidelying Hip Abduction

REPS: 10-15

SETS: 3

DAILY: 1

WEEKLY: 3-4



### Setup

Begin lying on your side with your top leg straight and your bottom leg bent.

### Movement

Lift your top leg up toward the ceiling, then slowly lower it back down and repeat.

### Tip

Make sure to keep your leg straight and do not let your hips roll backward or forward during the exercise.

## Active Straight Leg Raise with Quad Set

REPS: 10-15

SETS: 3

DAILY: 1

WEEKLY: 3-4



### Setup

Begin lying on your back with one knee bent and your other leg straight

### Movement

Squeeze the thigh muscles in your straight leg and flex your foot, then slowly lift your leg until it is parallel with your other thigh. Lower your leg back to the starting position and repeat.

### Tip

Make sure to keep your back flat against the floor during the exercise.

# 0 to 2 Weeks Post-op

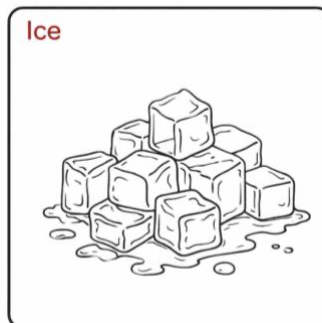
## Goals – 0 to 2 weeks:

1. Protect incision and skin.
2. Minimize swelling.
3. Gentle early work on range of motion & home therapy.
4. Continue healthy recovery choices.

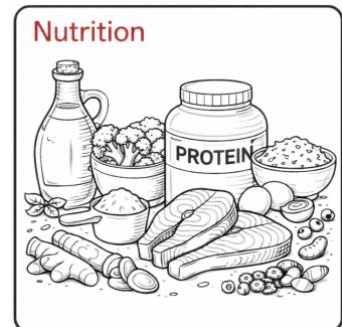
## KEY TAKE-AWAYS



**Minimum range of motion goal at 14 days:**  
full extension to 90 degrees



**Home 20/20/20 Rule:**  
20 min ice.  
20 min elevate & rest.  
20 min gentle ROM, therapy.



**Protein goal** \*150 g/day.

**Hydration** 2L water/day.

**Diosmin + Hesperidin**  
twice daily.

### 1. Protect incision & skin.

- Keep incision clean and dry.
- First post-op dressing to be removed and replaced as per discharge documentation / patient booklet.
- Soft pants or shorts to prevent irritation.

## 2. Minimize swelling.

- Apply **ice** machine 20 minutes of every waking hour during the day.
- Elevate** above the level of the heart during icing.
- Consider use of **compression stockings or compression sleeve.**
- Continue **anti-inflammatory diet**; such as mediterranean (Attachment B, C).
- Purchase **Nature's Craft Diosmin + Hesperidin** (Attachment D).  
Take twice daily 21 days after surgery.
- Continue **supplemental protein** / nutrition (see Pre-Operative page).
- Drink at least 2 liters of water per day.

## 3. Gentle early work on range of motion & home therapy.

- At home therapy.  
Home therapy exercises (See pages 8-9).
- Formal Physical Therapy exercises in "Therapist Version".

## 4. Continue healthy recovery choices.

- Proper hydration and nutrition.  
Continue anti-inflammatory diet.  
Continue 150 mg/day protein goal or **Enroute supplementation.** (Attachments A, B, C).  
Drink 2 liters of water per day.  
Abstain from alcohol, smoking, or other substances that would hurt recovery.  
Try to **sleep at least 8 hours per night.**

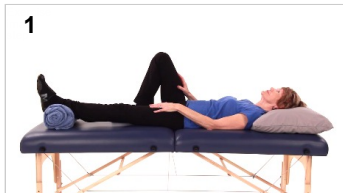
### **Tips & Helpful Reminders:**

- ➔ The first 2 weeks are the most challenging. Lean on your family, friends, or other support group members to keep you optimistic and working hard.
- ➔ Sleep is challenging during these first 2 weeks. Reach out to us or your primary care provider for suggestions.
- ➔ Follow your post-operative pain regimen closely, and reach out to us with questions.

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## Supine Knee Extension Stretch on Towel Roll

<b>SETS: 3</b>	<b>HOLD: 5 MIN</b>	<b>DAILY: 4-5</b>	<b>WEEKLY: 7</b>
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This or the seated version can be used pending patient comfort.

### Setup

Begin lying on your back with one leg bent, and your other leg straight with your heel resting on a rolled towel.

### Movement

Lay in this position with your leg relaxed and knee straight.

### Tip

Make sure to keep your back flat on the bed during the exercise.

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## Seated Knee Extension Stretch with Chair

<b>SETS: 1</b>	<b>HOLD: 5 MIN</b>	<b>DAILY: 4-5</b>	<b>WEEKLY: 7</b>
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This or the supine version can be used pending patient comfort.

### Setup

Begin sitting upright with a chair directly in front of you.

### Movement

Lift one leg off the ground and rest your foot on the chair, then begin to relax your leg, allowing your knee to straighten, and hold this position.

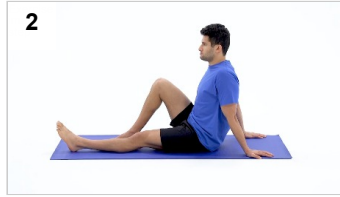
### Tip

Make sure to keep your back straight during this stretch.

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## Long Sitting Quad Set

<b>SETS: 3</b>	<b>REPS: 25</b>	<b>DAILY: 4-5</b>	<b>WEEKLY: 7</b>
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### Setup

Begin sitting upright on the floor with one leg laying straight and your other knee bent.

### Movement

Straighten your leg, pushing your knee toward the floor, and hold.

### Tip

Make sure to keep your back straight during the exercise.

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## Supine Ankle Pumps

<b>SETS: 3</b>	<b>REPS: 25</b>	<b>DAILY: 4-5</b>	<b>WEEKLY: 7</b>
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### Setup

Begin lying on your back with your legs straight.

### Movement

Slowly pump your ankles by bending and straightening them.

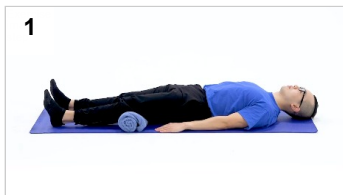
### Tip

Try to keep the rest of your legs relaxed while you move your ankles.

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## Supine Short Arc Quad

<b>SETS: 3</b>	<b>REPS: 10-15</b>	<b>DAILY: 4-5</b>	<b>WEEKLY: 7</b>
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### Setup

Begin lying on your back with a towel roll under one knee with your heel resting on the ground.

### Movement

Tighten the muscles in your upper leg to straighten your knee, hold, then return to the start and repeat.

### Tip

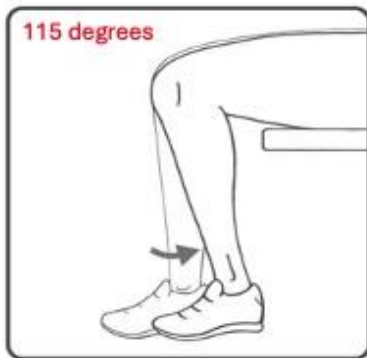
Make sure to keep your back flat against the floor as you move your leg.

# 2 to 6 Weeks Post-op

## Goals – 2 to 6 weeks:

1. Protect incision and skin.
2. Minimize swelling.
3. Push range of motion & home therapy.
4. Begin muscular strengthening and balance.
5. Continue healthy recovery choices.

## KEY TAKE-AWAYS

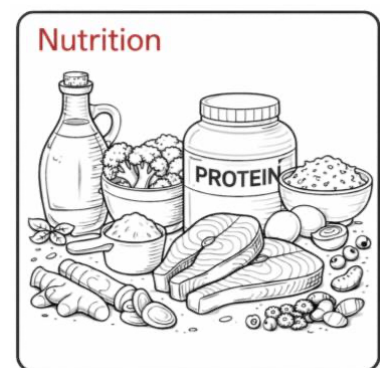


**Minimum range of motion goal at 6 weeks:**  
full extension to 115 degrees



**Ice & Elevate** 4-5 times per day, 10 minutes.

**Compression socks** most hours



**Protein goal** \*150 g/day.

**Hydration** 2L water/day..

### 1. Protect incision & skin.

- Continue covering incision for showers / hygiene.
- No kneeling.
- Follow post-op dressing plans per discharge documentation / patient booklet.
- Soft pants or shorts to prevent irritation.

## 2. Minimize swelling.

- Apply ice machine 10 minutes, 4-5 times per day (minimum).
- Elevate above the level of the heart during icing.
- Consider use of compression stockings or compression sleeve.
- Continue anti-inflammatory diet; such as mediterranean (Attachment B, C).
- Continue supplemental protein (see Pre-Operative, #2; Attachment A).

## 3. Push range of motion & therapy.

## 4. Begin muscular strengthening & balance.

- At home therapy.  
Home therapy exercises (See pages 12-16).

*Bonus: may implement stationary or recumbent bike (low resistance, longer time).*

- Formal Physical Therapy exercises in “Therapist Version”.

## 5. Continue healthy recovery choices.

### → Proper hydration and nutrition.

Continue anti-inflammatory diet.

Continue 150 mg/day protein goal or Enroute supplementation (Attachments A, B, C)

Drink 2 liters of water per day.

Abstain from alcohol, smoking, or other substances that would hurt recovery.

Try to sleep at least 8 hours per night.

### **Tips & Helpful Reminders:**

- Weeks 2 to 6 you will take big strides in your range of motion, strength, and ability to regain more normal walk.
- Your knee will not yet feel “normal”.
- It is normal to have achiness, pain, stiffness, or swelling particularly after an active day or new activities.
- Do something active each day, even if it is for a short while.

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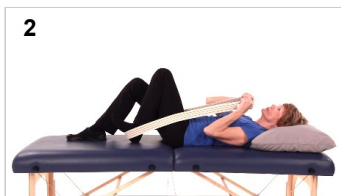
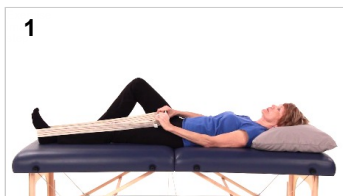
## Supine Heel Slide with Strap

SETS: 3

REPS: 15

DAILY: 2-3

WEEKLY: 7



### Setup

Begin lying on your back with your legs straight, holding the ends of a strap that is looped around the bottom of one foot.

### Movement

Pull on the strap, sliding your heel toward your buttocks, then slide your heel back to the starting position and repeat.

### Tip

Make sure you keep your back flat against the bed during the exercise.

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## Active Straight Leg Raise with Quad Set

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin lying on your back with one knee bent and your other leg straight

### Movement

Squeeze the thigh muscles in your straight leg and flex your foot, then slowly lift your leg until it is parallel with your other thigh. Lower your leg back to the starting position and repeat.

### Tip

Make sure to keep your back flat against the floor during the exercise.

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## Sidelying Hip Abduction

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin lying on your side with your top leg straight and your bottom leg bent.

### Movement

Lift your top leg up toward the ceiling, then slowly lower it back down and repeat.

### Tip

Make sure to keep your leg straight and do not let your hips roll backward or forward during the exercise.

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## Standing Heel Raise with Chair Support

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin in a standing position with your hands resting on a chair or table for support.

### Movement

Keeping your legs straight, slowly raise the your heels off the ground as far as you can, then return them to the floor and repeat.

### Tip

Make sure to keep the balls of your feet in contact with the ground and maintain your balance during the exercise.

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## Step Up

<b>SETS: 3</b>	<b>REPS: 10-15</b>	<b>DAILY: 1</b>	<b>WEEKLY: 7</b>
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### Setup

Begin standing with a small step or platform in front of you.

### Movement

Step up onto the platform with one foot then follow with your other foot. Return back down to the starting position and repeat.

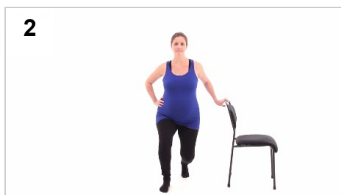
### Tip

Make sure to maintain good posture during the exercise and do not let your knee bend forward past your toe as you step up.

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## Standing Partial Lunge

<b>SETS: 3</b>	<b>REPS: 10-15</b>	<b>DAILY: 1</b>	<b>WEEKLY: 7</b>
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### Setup

Begin in a standing upright position.

### Movement

Step forward with one foot and lower your body down into a mini lunge position. Straighten your legs back to standing and repeat.

### Tip

Make sure to maintain your balance and do not let your front knee move forward past your toes.

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## Seated Long Arc Quad

<b>SETS: 3</b>	<b>REPS: 10-15</b>	<b>DAILY: 1</b>	<b>WEEKLY: 7</b>
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### Setup

Begin sitting upright in a chair.

### Movement

Slowly straighten one knee so that your leg is straight out in front of you. Hold, and then return to starting position and repeat.

### Tip

Make sure to keep your back straight during the exercise.

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## Single Leg Press

<b>SETS: 3</b>	<b>REPS: 10-15</b>	<b>DAILY: 1</b>	<b>WEEKLY: 7</b>
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### Setup

Begin by loading the machine with your desired amount of weight. Sit on the seat of the machine with your back flat against the back rest. Firmly plant both feet on the foot platform so that your feet are hip width apart or slightly wider. To unlock the machine, push up on the platform and pull the lever by your side towards you.

### Movement

Remove one leg from the foot platform. Bring your knee toward your chest to slowly lower the weight as far as you can while keeping your hips against the seat. Then press up into your foot to straighten your leg without locking your knee, and repeat.

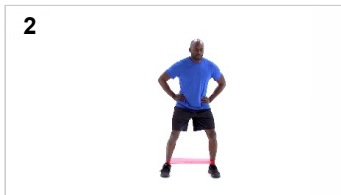
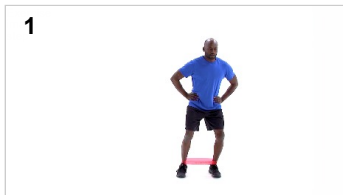
### Tip

Make sure to keep your movements slow and controlled. Do not let your knee collapse inward or move forward past your toes during the exercise. Remember to engage the platform lock when you are finished.

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## Side Stepping with Resistance at Ankles

<b>SETS: 3</b>	<b>REPS: 10-15</b>	<b>DAILY: 1</b>	<b>WEEKLY: 7</b>
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### Setup

Begin standing upright with a resistance band looped around your ankles. Bend your knees slightly so you are in a mini squat position.

### Movement

Slowly step sideways, maintaining tension in the band.

### Tip

Make sure to keep your feet pointing straight forward and do not let your knees collapse inward during the exercise.

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## Single Leg Stance

<b>SETS: 3</b>	<b>HOLD: 30 SECONDS</b>	<b>DAILY: 1</b>	<b>WEEKLY: 7</b>
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### Setup

Begin in a standing upright position with your feet together and arms resting at your sides.

### Movement

Lift one foot off the floor, balancing on your other leg. Maintain your balance in this position.

### Tip

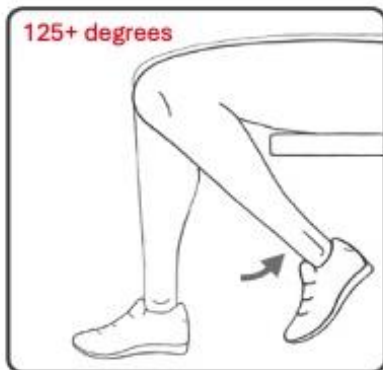
Try not to move your arms away from your body or let your weight shift from side to side.

# 6 to 12 Weeks Post-op

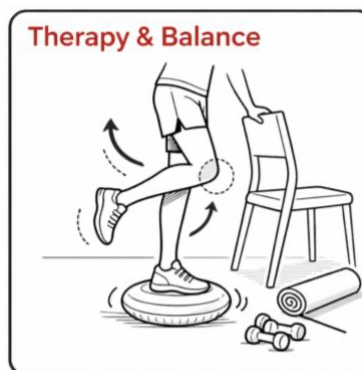
## Goals – 6 to 12 weeks:

1. Minimize swelling.
2. Continue range of motion, strengthening, and balance exercises.
3. Begin normalizing daily activities.

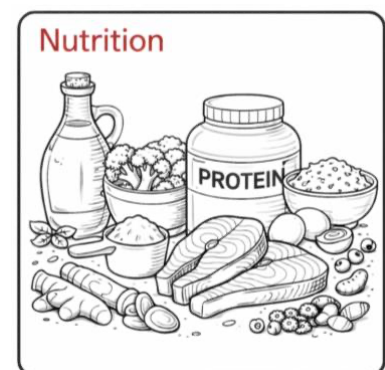
## KEY TAKE-AWAYS



**Minimum range of motion goal at 12 weeks:**  
*full extension to >125 degrees*



Work hard for **range of motion**, **balance**, and **strength** in the knee and leg.



**Healthy diet**, high in protein.  
**Hydration** 2L water/day.

### 1. Minimize swelling.

- Apply ice machine 10 minutes, every evening daily (at least).
- Consider use of compression stockings or compression sleeve as needed.
- Continue healthy diet of choice.
- Drink at least 2 liters of water per day.

**2. Continue range of motion, strengthening, and balance exercises.**

**3. Begin normalizing daily activities.**

- At home therapy.

Home therapy exercises (See pages 20-23).

*Bonus: may implement upright or recumbent bike, resistance band training, rowing, walking/hiking, etc as per patient preference.*

- Formal Physical Therapy exercises in “Therapist Version”.

*\*\* Patients with higher activity goals will begin working sport- or activity-specific rehabilitation with therapist. This commonly continues for >3 months and is based on progress and objective metrics.*

**Tips & Helpful Reminders:**

➔ Safe kneeling.

Pad under knee, if needed. It is common for kneeling to feel uncomfortable for months following total knee replacement.

➔ Risk of weight gain following TKA.

It is common after the period of recovery from total knee replacement that weight gain may occur. Research shows us that many patients gain 5% or more of their body weight within 5 years. We encourage continued monitoring, as every 1 lb of weight gain results in 5 lbs of weight seen by the knees. This is more stress and likely more pain in the replaced knee.

➔ Nutrition.

While the mediterranean diet or other anti-inflammatory diets have demonstrated positive health benefits for all people, we understand that many will want to get back to their comfortable food habits. We encourage continued healthy dietary intake with appropriate portions, and establishing positive eating habits for the years ahead.

## Tips & Helpful Reminders:

➔ Exercise, activity, and sport.

The purpose of your knee replacement is to allow you to perform the activities that are necessary for daily life, healthy living, and that provide joy to life. The ultimate goal will be for you to return to any activities you prefer. However, high-impact, repetitive activities can lead to dull pain or aches, and could risk wearing out your replaced knee quicker (i.e. running on pavement, repetitive jumping on hard surfaces, etc).

We encourage avoiding any activities that result in pain or achiness to the joint, but establishing an active lifestyle that includes exercise most or all days of the week.

➔ *At 6 weeks, knee is usually 50% recovered.*

➔ *At 12 weeks, knee is usually 75% recovered.*

➔ *It is normal for the knee not to feel “normal” for 6 to 16 months after surgery. The goal is for you to forget your knee was replaced. However, we must stay aware that a replaced knee will not necessarily feel like a healthy, 20-year-old knee.*

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## Forward Step Down Touch with Heel

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin standing at the edge of a step, holding onto a stable object for support.

### Movement

Lift one leg in front of your body and squat down until your heel touches the ground, then return to the starting position and repeat.

### Tip

Make sure to keep your back straight and upright during the exercise, and try to keep your hips level as you bend down. Maintain even breathing during this activity.

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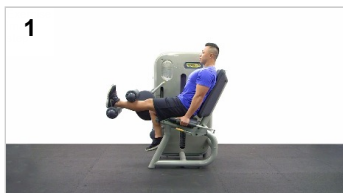
## Single Leg Hamstring Curl with Weight Machine

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin by sitting on the seat of the machine, placing one foot between the two roller pads. Adjust the pin to your desired weight. Check that the seat is in the correct position. The lower roller pad should be resting slightly above your heel. If needed, adjust the lever at your side so that you start with your feet lifted.

### Movement

Engage the muscles in the back of your thigh to press down the bottom roller pad, curling your heel toward the floor. Slowly reverse the movement and repeat.

### Tip

Make sure to keep your movements slow and controlled. Do not let your knee lock during the exercise.

## Single Leg Knee Extension with Weight Machine

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin by sitting on the seat of the machine, placing your feet underneath the roller pad. Adjust the pin to your desired weight. Check that the seat is in the correct position. Your knees should bend right at the edge of the seat. If you can adjust the roller pad, make sure it rests just above your ankles.

### Movement

Engage the muscles in the front of your thigh to lift the roller pad up with one foot, straightening your leg, then slowly reverse the movement, and repeat.

### Tip

Make sure to keep your movements slow and controlled. Do not let your knees lock during the exercise.

## Split Squat Forward Trunk with Dumbbells

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin standing, holding dumbbells in each hand. Then, step forward with one leg. Your feet should be hip width apart. There should be a slight forward lean in your trunk, hinging at the hips with spine in a neutral position.

### Movement

Lower your body down as far as tolerated, using the front leg to do most of the work. Then, driving through the midfoot on the front foot, return to the upright split-stance position. Repeat as prescribed.

### Tip

Keep front hip, knee, ankle in alignment with the knee in line with the second toe. Weight on the front leg should be centered on the midfoot throughout the exercise. On the rear leg, maintain weight on the base of your toes. Keep a slight forward trunk lean.

## Single Leg Heel Raise with Chair Support

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin in a standing upright position holding onto the back of a chair for support.

### Movement

Lift one foot off the ground to balance on your other foot. When you are balanced, slowly raise your heel off the ground, then lower it back down and repeat.

### Tip

Make sure to maintain your balance during the exercise and do not let your ankle rotate to either side.

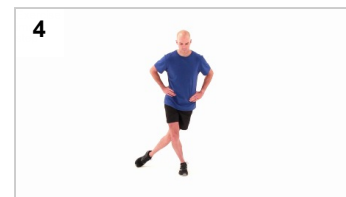
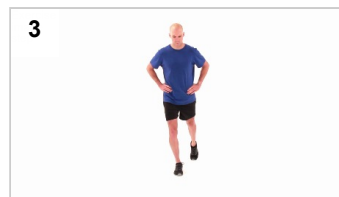
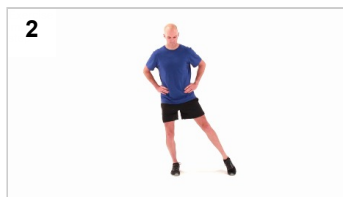
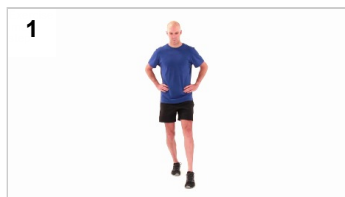
## Single Leg Balance with Clock Reach

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin in a standing upright position. Imagine you are standing in the middle of a clock.

### Movement

Bend your legs slightly, then reach forward with one foot toward 12 o'clock, then bring it back to the starting position and reach toward 3 o'clock. Continue, reaching toward 6 o'clock, then 9 o'clock, and repeat.

### Tip

Make sure to keep your hips level as you reach with your leg, and do not let your standing knee collapse inward.

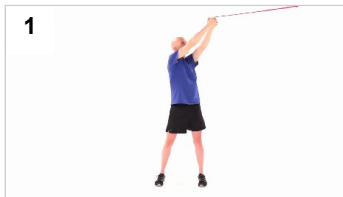
## Standing Diagonal Chop

SETS: 3

REPS: 10-15

DAILY: 1

WEEKLY: 7



### Setup

Begin in a standing upright position, holding the end of a resistance band with both hands. The band should be anchored above and to your side.

### Movement

Slowly pull the band down and across your body in a diagonal movement, rotating your trunk, then return to starting position and repeat.

### Tip

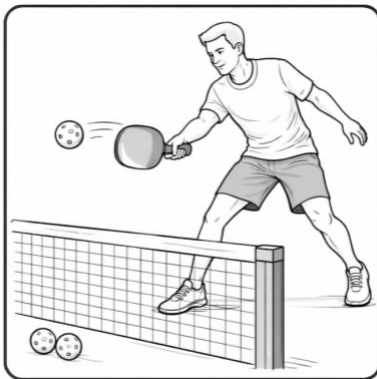
Make sure to keep your arms straight, and activate your core muscles as you rotate your trunk.

# 3 Months and Beyond Post-op

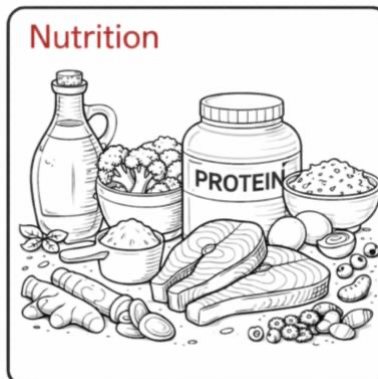
## Goals – 3 months and beyond:

1. Eliminate any remaining soft tissue swelling.
2. Restore functional and high-level activities.
3. Education, Tips, Tricks.

## KEY TAKE-AWAYS



Return to **all desired activities** and **exercise**.



**Healthy diet**, high in protein.

**Hydration** 2L water/day.



**Improvement** continues for up to **16 months**.

### 1. Eliminate any remaining soft tissue swelling.

- Ice 10 minutes at a time, as needed, when needed.
- Compression socks, as needed, when needed.

## 2. Restore functional and high-level activities.

- At home therapy.

Return to all desired daily activities or exercise modalities.

- With Your Physical Therapist:

Guided by Physical Therapist.

Any final activity-specific training for return to desired activities and sport.

*\*\* NOTE: in the event you discontinue formal physical therapy or will be discontinuing formal physical therapy soon, it is important that you leave physical therapy with a home exercise program in place to continue your progress and have available to use as needed in months to come.*

We encourage avoiding any activities that result in pain or achiness to the joint, but establishing an active lifestyle that includes exercise most or all days of the week.

*\*\* NOTE: Patients with higher activity goals will begin working sport- or activity-specific rehabilitation with therapist. This commonly continues for >3 months and is based on progress and objective metrics.*

### **Tips & Helpful Reminders:**

- ➔ Safe kneeling.

Pad under knee, if needed. It is common for kneeling to feel uncomfortable for months following total knee replacement.

- ➔ Risk of weight gain following TKA.

It is common after the period of recovery from total knee replacement that weight gain may occur. Research shows us that many patients gain 5% or more of their body weight within 5 years. We encourage continued monitoring, as every 1 lb of weight gain results in 5 lbs of weight seen by the knees. This is more stress and likely more pain in the replaced knee.

## Tips & Helpful Reminders:

### → Nutrition.

While the mediterranean diet or other anti-inflammatory diets have demonstrated positive health benefits for all people, we understand that many will want to get back to their comfortable food habits. We encourage continued healthy dietary intake with appropriate portions, and establishing positive eating habits for the years ahead.

### → Exercise, activity, and sport.

The purpose of your knee replacement is to allow you to perform the activities that are necessary for daily life, healthy living, and that provide joy to life. The ultimate goal will be for you to return to any activities you prefer. However, high-impact, repetitive activities can lead to dull pain or aches, and could risk wearing out your replaced knee quicker (i.e. running on pavement, repetitive jumping on hard surfaces, etc).

We encourage avoiding any activities that result in pain or achiness to the joint, but establishing an active lifestyle that includes exercise most or all days of the week.

**→ *It is normal for the knee not to feel “normal” for 6 to 16 months after surgery. The goal is for you to forget your knee was replaced. However, we must stay aware that a replaced knee will not necessarily feel like a healthy, 20-year-old knee.***

# Proper nutrition is crucial for a successful recovery after surgery.

Your surgeon recommends the **ENROUTE® 4-week nutrition program**, which provides science-backed support for surgical recovery.



**Maintains Muscle Mass**



**Supports Bone Health**



**Enhances Immune Function**



**Promotes Wound Healing**

## Designed for Orthopaedic Surgery

Most store-bought protein drinks lack key ingredients in sufficient amounts to support muscle recovery.

**ENROUTE® nutrition is created by experts to help support a rapid recovery.**

Available only through your surgeon

Access to dietitians

Plant-based options available

"I was pleasantly surprised by the great taste. Unlike other supplements I have tried, these drinks were genuinely enjoyable. I noticed a significant boost in my energy levels."

**Shirley F.**



"This is the best protein supplement I've had. I prefer it to other shakes since it has much less sugar with all of the good effects."

**Elaine M.**

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Complete Surgical Nutrition Program

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# Own Your Recovery

Surgery can be stressful, but getting the right nutrition doesn't need to be.

**We've got you covered for a smooth recovery.**

Take control

Feel confident

Stay energized

"I've experienced a noticeable boost in energy and my recovery time is much quicker than my previous surgeries where I didn't take the drinks."

Pat H.

## Your surgeon recommended program includes



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56 servings of  
Multi-Nutrient Formula



**ENROUTE® PREPARE**  
2 servings of Complex  
Carbohydrate Formula



**SHAKER BOTTLE**  
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**DEDICATED  
PATIENT SUPPORT**  
Access to Dietitians



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✓ Delivered to your door

✓ HSA/FSA eligible

✓ Easy returns



### Order via Phone

Access nutrition experts and dietitians to answer your questions.

**1-800-619-0783**



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1. Visit [www.getenroute.com](http://www.getenroute.com) and click **SHOP**.
2. Find your surgeon to access the program.
3. Select your protein source and flavor.
4. Get the ENROUTE® program delivered.



## Eating to Reduce Inflammation

## Attachment B

### What is inflammation?

Inflammation is one of the body's ways of protecting itself. It helps fight off infections, increases blood flow to places where healing is needed, and signals us, through pain, that something is wrong. But if inflammation levels are too high, or if a person stays in an inflamed state for too long (has chronic inflammation), it can lead to disease.

### What diseases are associated with unhealthy inflammation?

Many diseases are linked to inflammation. These are often chronic (long-lasting) diseases, which can be very hard to treat. Here are some examples:<sup>1,2</sup>

- Alzheimer's disease
- Asthma
- Autoimmune diseases (diseases where the body is attacked by its own immune system). These include rheumatoid arthritis, scleroderma, and lupus.
- Cancer
- Chronic obstructive lung disease, also called COPD (emphysema and bronchitis)
- Chronic pain (e.g. back pain, neck pain, headaches, arthritis)
- Depression
- Heart disease
- Inflammatory bowel disease (Crohn's or ulcerative colitis)
- Type 2 diabetes
- Obesity

There are many others as well. What they all have in common is that they can often be prevented or reduced if you focus on eating some foods and not eating others. This way of eating is often called the Anti-Inflammatory Diet. Unlike other diets, an anti-inflammatory diet is not meant to be a diet for losing weight. It supports your health in other ways.

### How do I eat an anti-inflammatory diet?

It is thought that over 60% of all chronic disease could be prevented if people ate a healthy diet.<sup>3</sup> What does that diet look like? Some of the most important parts of it are listed below.<sup>4</sup> Choose any one to start out. Over time, you can add others at a pace that works for you.

### The Anti-Inflammatory Diet: Top Ten Suggestions

1. **Pay attention to proteins.** If you get most of your proteins from plants like beans, whole grains, and nuts, your levels of inflammation will be lower. If you eat red meat, it is best to eat grass-fed meat or wild game rather than grain-fed beef.<sup>5</sup> Wild-caught (as opposed to farmed) fish can be a great source of protein. As journalist Michael Pollan says in his book *Food Rules*, "The fewer the feet, the better the meat."<sup>6</sup>
2. **Eat more fiber.** Fiber, which is a form of carbohydrate, lowers inflammation.<sup>7</sup> Read food labels. Different groups suggest different daily amounts, but try for the following:
  - Women 19-50 years old: 25 grams daily

- Men 19-50: 38 grams daily
- Women over 50: 21 grams daily
- Men over 50: 30 grams daily

Good sources of fiber include whole grains, oatmeal, nuts, berries, beans, vegetables, brown rice, and popcorn. Potato skins have a lot of fiber. If you don't already eat much fiber, increase your intake of these foods slowly to avoid bowel discomfort.

3. **Eat your vegetables and fruits.** When it comes to ideas for healthier eating, eating more fruits and vegetables is usually at the top of the list. In addition to their many other benefits, vegetables and fruits reduce inflammation. Berries and cherries are especially good options. Fruit juice is *not* usually a good choice because it is high in sugars and low in fiber. Making your own smoothies is a good idea. Choose dark colored produce that is many different colors. Plants get their colors from phytonutrients, helpful compounds that are anti-inflammatory. Strive for a minimum of 5 cups of vegetables and fruits per day. If you have diabetes or pre-diabetes, emphasize non-starchy vegetables over fruits.
4. **Use more anti-inflammatory herbs and spices.**<sup>8,9</sup> A 2012 study found that some of the best anti-inflammatory spices to eat, in order, are paprika, rosemary, ginger, turmeric, sage, and cumin. An earlier study looked at other chemical properties of spices and found that cloves, ground Jamaican allspice, cinnamon, sage, marjoram, and tarragon are also great choices.

*Guidelines 5-8 are related to fats. In the body, different types of fats are processed in different ways, which can either increase or decrease inflammation.*

5. **Avoid trans-fats.** *Trans-fats*, which are added to foods to increase their shelf life, can add to the body's inflammation. Avoid foods that have labels saying they have "partially hydrogenated" oils. Foods that often have trans-fats include baked goods (e.g. cakes, piecrusts, frozen pizza, and cookies) and fried foods (e.g. donuts, fries).
6. **Limit saturated fats.** Most (not all) *saturated fats* also promote inflammation. These fats mostly come from animal sources such as meats (lamb, pork, chicken with skin, fatty beef), and dairy products like milk, cheese, cream, and butter. If you eat meat, a good general rule is to try to eat white meats, fish and other seafood. Saturated fats from plants (coconut and palm kernel oils) may not be as much of a problem.
7. **Balance omega-6's and omega-3's.** You may have heard about *essential fatty acids*. These are types of *polyunsaturated fats* that your body can't make on its own. You have to get them from your diet. You need both *omega-6 and omega-3 fats* for your body to work properly, but they need to be in the right balance. The problem is that eating high amounts of omega-6 fats compared to omega-3's can increase inflammation. Unfortunately, that is exactly what most Americans do. Our ancestors ate twice as much omega-6 fat as omega-3. Nowadays, most Americans eat 14 to 25 times as much omega-6.

## Attachment B Eating to Reduce Inflammation

Omega-6's come from plant oils like corn oil, soybean oil, and sunflower oil, as well as nuts and seeds. Omega-3's are found in fatty fish like salmon, tuna, and mackerel. Try to eat at least two servings of fish (3-4 ounces each) weekly. Fish oil supplements are widely available. A usual dose is 1000-2000 mg per day. If you are taking blood thinners, talk to your doctor before you start taking fish oil. Omega 3's are also found in whole grains, walnuts, and green leafy vegetables. Eating a Mediterranean diet will give you a much healthier balance of omega-6's and omega 3's than the average American diet. For more information, reference the Whole Health handout "[How to Eat a Mediterranean Diet.](#)"

- 8. Eat monounsaturated fats.** There are also *monounsaturated fats*. One of these, olive oil, is known to reduce inflammation, blood pressure, bad cholesterol, and blood sugar levels. Other sources of this type of fat are canola, peanut, safflower, and sesame oils. Avocados are another good source.

Some experts suggest you get  $\frac{1}{4}$  of your fat from saturated fats,  $\frac{1}{4}$  from polyunsaturated, and  $\frac{1}{2}$  from monounsaturated. Many diets recommend that total fats add up to about  $\frac{1}{3}$  of all the calories you eat.<sup>10</sup> You have to explore what works best for you.

- 9. Eat some dark chocolate.**<sup>11</sup> Most people like this suggestion. To help with inflammation, dark chocolate should be at least 70% cocoa mass. The cocoa percentage will be on the label. One and a half ounces daily decreases inflammation and also lowers blood pressure.
- 10. If you choose to drink alcohol, choose red wine.** Red wine is known to decrease inflammation.<sup>12</sup> Of course, don't take up drinking to get this benefit. One study found that drinking white wine and cooking with olive oil worked together to lower inflammation as well.<sup>13</sup> Other beverages, like grape juice,<sup>14</sup> have been found to have some benefits, too, though we need more studies to see how different beverages compare. Remember, though, that even one drink of alcohol a day can increase risk of breast cancer.<sup>15</sup>

### Can anything besides what I eat lower inflammation?

In addition to watching what you eat and drink, focusing on other areas of self-care can also help lower inflammation. For example:

- Working the body reduces chronic inflammation.<sup>16,17</sup>
- Stress raises inflammation in the body,<sup>18</sup> so do your best to keep your stress at a healthy level. There are many ways to manage stress, such as breathing exercises and meditation. These are outlined in the Power of Mind handouts.
- Depression is linked to more inflammation too.<sup>19</sup> Explore ways to support good mental and emotional health.
- Getting enough sleep helps to keep inflammation under control.<sup>20</sup>
- Some studies show that having healthy relationships with others lowers inflammation.<sup>21</sup>
- Being a spiritual/religious person also seems to be linked to less inflammation.<sup>22</sup>

**A Quick Guide to Eating and Inflammation****INCREASE****Fruits & Vegetables**

- ☑ Red: berries, cherries, peppers
- ☑ Orange-Yellow: Sweet potato, pineapple, yellow pepper, squash, peaches
- ☑ Green: Dark leafy greens, broccoli, cabbage, green beans, Brussels sprouts
- ☑ Blue/Purple/Black: blueberries, blackberries, grapes, eggplant, olives, plums, purple cabbage

**Fiber**

- ☑ Whole grains, oatmeal, bran cereal, nuts, berries, beans, brown rice, popcorn, potato skins
- ☑ Vegetables
- ☑ Fruits

**Proteins**

- ☑ Plant-based (beans, grains, nuts, seeds)
- ☑ Grass-fed or wild meat and fish

**Herbs & Spices**

- ☑ Paprika, rosemary, ginger, turmeric, sage, cumin, cloves, Jamaican allspice, cinnamon, marjoram, tarragon, green and black tea

**Omega-3's**

- ☑ Fatty fish (salmon, tuna, mackerel)
- ☑ Fish oil
- ☑ Whole grains, walnuts, green vegetables
- ☑ *Eat more Omega-3's than Omega-6's*

**Monounsaturated Fats**

- ☑ Oils (olive, canola, peanut, safflower, sesame)
- ☑ Avocados

**Desserts /Snacks**

- ☑ Dark chocolate (70% of cocoa or more)

**DECREASE****Proteins**

- ☑ Grain-fed beef
- ☑ Processed meats (lunch/deli meats, hot dogs, bacon, sausage)

**Trans-fats**

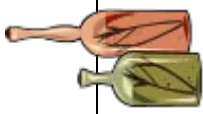
- ☑ Partially hydrogenated oils
- ☑ Baked goods (cakes, pie crusts, frozen pizza, cookies)
- ☑ Fried foods (donuts, fries)

**Saturated Fats**

- ☑ Meats (lamb, pork, fatty beef, chicken with skin)
- ☑ Dairy products (milk, cheese, cream, butter)
- ☑ Fruit juice

## Mediterranean Diet

Choosing a diet similar to one eaten by people living around the Mediterranean Sea may lower the risk of cardiovascular disease and have additional health benefits. The diet is mostly plant-based with high amounts of fresh vegetables, fruits, nuts, dried beans, olive oil, and fish. Follow these tips to eat the Mediterranean way!

Food/Food Group	Recommended Intake*	Tips
Vegetables	4 or more servings each day (one portion each day should be raw vegetables)	A serving is 1 cup raw or ½ cup cooked vegetables. Eat a variety of colors and textures.
Fruits	3 or more servings each day	Make fruit your dessert
Grains	4 or more servings each day	Choose mostly whole grains. 1 serving = 1 slice bread or ½ cup cooked oatmeal
Fats/Oils	Olive Oil: 4 Tablespoons or more each day 	Choose extra virgin olive oil (EVOO) and use in salad dressings and cooking; choose avocado or natural peanut butter instead of butter or margarine
Dried Beans/Nuts/Seeds	Nuts/Seeds: 3 or more servings each week Beans/Legumes: 3 or more servings each week	1 ounce or 1 serving = 23 almonds or 14 walnut halves; 1 serving of beans = ½ cup
Fish and Seafood	2-3 times each week	Choose salmon, sardines, and tuna which are rich in Omega-3 fatty acids
Herbs and Spices	Use daily	Season foods with herbs, garlic, onions and spices instead of salt
Yogurt/Cheese/Egg Poultry	Choose daily to weekly	Choose low-fat yogurt and cheeses; choose skinless chicken or turkey in place of red meat
Alcohol/Wine	Men: 1-2 glasses each day Women: 1 glass each day	Always ask your medical team if alcohol is ok for you to consume.

**\*Serving sizes should be individualized to meet energy and nutrient needs.**

- ❖ Red meats, processed meats, and sweets should be limited

**Attachment C**

**Mediterranean Diet Pyramid**  
*A contemporary approach to delicious, healthy eating*

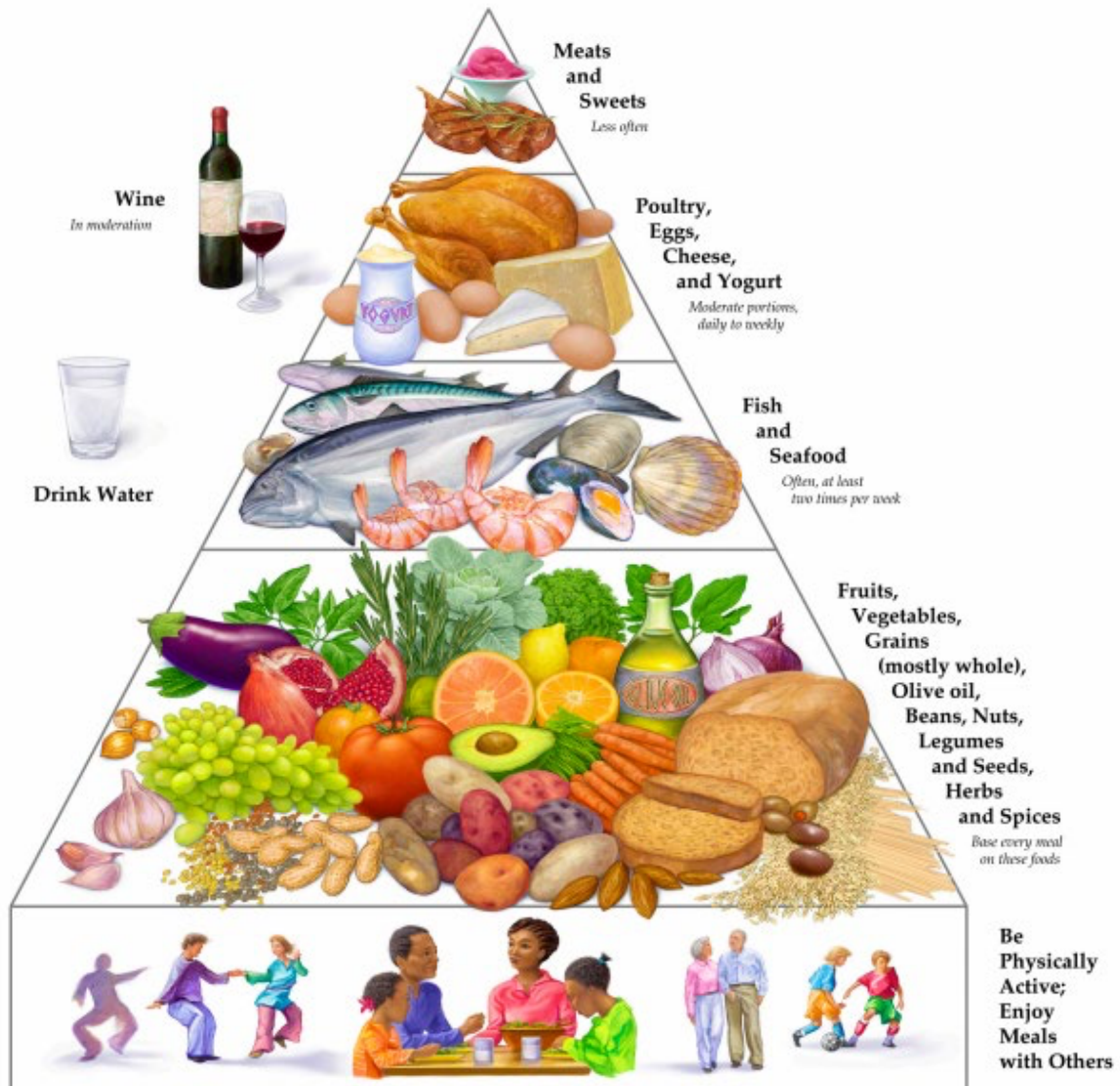


Illustration by George Middleton

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Figure 1. Oldways Mediterranean Diet Pyramid.<sup>13</sup> Reprinted with permission from Oldways Preservation & Exchange Trust. <https://www.oldwayspt.org/traditional-diets/mediterranean-diet>

# Attachment D

Health & Household › Vitamins, Minerals & Supplements › Blended Vitamin & Mineral Supplements



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