Do you know that stroke survivors are at risk for:

- **Being physically inactive.**
  More than 50% of survivors do not reach recommended physical activity levels for health and well-being and may spend over 75% of their day sitting or lying. Inactivity increases the risk of suboptimal brain repair after stroke and the risk of another stroke.

- **Falling and fracturing a hip.**
  Survivors fall more than twice as often and are four times more likely to fracture their hip compared to the general population. Falls typically occur in the home and soon after discharge from a hospital or rehabilitation facility.

- **Losing upper limb function.**
  More than 70% of survivors experience upper limb paresis and have difficulty with basic activities of daily living (i.e., dressing, personal hygiene, cooking, writing).

- **Re-hospitalization.**
  Survivors who are discharged home after stroke and do not receive any or receive limited rehabilitation therapy are at risk for re-hospitalization. Currently, only 32.5% of Medicare patients discharged to home receive PT/OT in first 30 days.

And that MOVEMENT MATTERS for recovering:

- **Fitness and Health**
- **Upper Extremity Dexterity and Function**
- **Safe Mobility and Independence in Home and Community**

**Movement in the form of physical activity and structured and progressive exercise:**
- Reduces the risk for subsequent cardiovascular events, promotes safety and independence in activities of daily living (ADLs) and physical mobility, and improves quality of life.
- Must be initiated early after stroke and be individually tailored to stroke-specific deficits for safety and for successful self-management.
**Movement Matters Activity Program (MMAP):**

**Prescribes:**
- An evidence-based combination of different modes of *structured and progressive* exercise – muscle strength, balance/coordination, flexibility, and aerobic exercise
- Physical activity as often as possible in the home and/or community (outside the structured exercise sessions)
- Self-directed exercise that incorporates functional rehabilitative tasks into activities of daily living

*Foster fitness and health and safe and independent mobility.*

**Key Principles:**

**Build the base:**
- A base of strength, balance, and coordination must be present to walk safely and for longer continuous periods. Thus, strength, balance, and coordination domains serve as building blocks for overall endurance, fitness, and independent and safe mobility.
  - As shown to the right, in low functional levels, the majority of rehabilitation is spent on building a base of strength, balance, and coordination. As function improves, concentration shifts to more continuous physical activity and aerobic exercise.

*Inform your client:* Movement matters for recovery of fitness and health.
Movement Matters Activity Program (MMAP):

Start low, progress consistently:

- The recommended amount of physical activity for all adults is **150 minutes/week**.
- Stroke survivors will likely not be able to perform the recommended amount soon after hospital discharge. Therefore, progress the amount of physical activity your client is engaged in consistently over time. As shown to the right, minutes of physical activity is increased consistently over multiple weeks.
- Shorter time intervals performed multiple times/day count toward total activity minutes.
- Start by promoting and maintaining movement within the home environment and introduce functional activities and exercise.

Reduce fall risk:

- Balance and strength exercises are essential components of intervention regimens to reduce falls in the elderly.
- Avoid brisk walking in high fall risk individuals.
- Recommend safe footwear.
- Use a gait belt for higher risk individuals.
- Be aware of potential medication side effects that can impact safe mobility (e.g., postural hypotension).

Early and consistent intervention is critical.

- The ability of the brain to repair is greatest in the first three (3) months after stroke.
- An activity must be practiced frequently and consistently for neural pathways to repair appropriately.

Inform your client: Recovery is a process that can take years and the potential for gains do not cease, as long as you continue to move and strive to increase your physical activity.
Movement Matters
Provider Handout

I. MMAP - Fitness and Health

**Muscle strength:**
- Include all the major muscle groups (legs, hips, back, abdomen, chest, shoulders, arms)
- Consider circuit training or functional mobility exercises (e.g., sit to stand, step-ups)
- 2-3 days/week
- 1-3 sets with 10-15 repetitions/set
- Rate of Perceived Exertion (RPE) should range between 13-16 (6-20 scale)

**Balance and Coordination:**
- Balance and coordination activities (e.g., reaching forward/backward; start-stop walking, accelerated/decelerated gait, braided gait)
- 2-3 days/week
- Coordination activities, if continuous, count toward total aerobic minutes

**Flexibility:**
- Static stretching (trunk, upper and lower extremities)
- Hold 10-30 second/stretch
- 2-3 days/week (before of after aerobic or strength activities)

**Aerobic:**
- Large muscle activities (e.g., walking, stationary cycling, arm ergometry)
- 5 days/week
- Progress minutes/day consistently over time and work toward 30 minutes of activity/day
- Moderate intensity (RPE 11-14)
- Multiple bouts/day of shorter time intervals count toward total minutes
- Shorter intervals should include at least 10 minutes of continuous activity

For more information see:
- [http://stroke.ahajournals.org/content/45/8/2532.abstract](http://stroke.ahajournals.org/content/45/8/2532.abstract)
- [http://www.cdc.gov/physicalactivity/basics/adults/](http://www.cdc.gov/physicalactivity/basics/adults/)

**NOTE:** If your client has lower levels of function, work on building the base of strength, balance, and coordination first before concentrating on aerobic fitness. Start by promoting and maintaining movement with the home environment and introduce functional activities and exercise into their daily activity.

**Inform your client:** Just 10 minutes of continuous physical activity at a time is beneficial to your health.
II. MMAP – Upper Extremity (UE) Dexterity and Function

GRASP (Graded Repetitive Arm Supplementary Program)

- A home-based structured and progressive self-directed UE exercise program (outside formal therapy time) to improve arm and hand function after stroke.

- Daily exercises are incorporated into functional tasks.

- Incorporates range of motion, strengthening, weight-bearing activities and functional activities:
  - Controlled weight-bearing through the hand increases UE muscle activation and aides in reducing known bone loss that occurs early after stroke.
  - Forced use of the UE during functional tasks improves arm and hand use after stroke.
  - Repetitive bilateral training improves arm and hand fine motor task performance.

- Family and caregiver engagement is key to success.

- Manual, participant guide, and suggested supplies and activities are available online:
  - www.neurorehab.med.ubc.ca - Click on GRASP

NOTE: Participants who do not have active shoulder shrug and wrist extension movements and/or have significant muscle stiffness of the hand and/or arm should be referred to PT or OT for stretching, ADL management, and exercise instruction and progression.

Inform your client: Physical inactivity is as bad for your health as smoking.
III. MMAP - Safe Mobility and Independence

OTAGO Exercise Program

- Series of 17 strength and balance exercises that reduces falls in frail older adults living at home.
- Program description: [http://www.med.unc.edu/aging/cgec/exercise-program](http://www.med.unc.edu/aging/cgec/exercise-program)

LiFE (Lifestyle-integrated Functional Exercise) Program

- Program aimed at reducing falls and improving function by embedding balance and strength activities into regular daily routines and tasks. For example, unloading the dishwasher becomes an opportunity to improve strength.

Ask your client: During the day, can you limit your daytime sitting and sleeping to no more than three (3) hours at a time?
Identifying the Appropriate Service for your Client

- Use of services to facilitate stroke recovery will vary based on the needs, resources, and preferences of the survivor and any caregiver.
- Some survivors may progress through all settings (Home Health, Outpatient Rehabilitation, community-based exercise programs) while others may skip settings or start somewhere along the continuum.
- Some survivors will be candidates for community-based programs or self-management following hospital discharge while others may benefit from formal therapy in the home and/or outpatient setting.
- Clients should be provided with the most suitable services to maximize the potential for recovery and achieve the ultimate goal of self-management of physical activity and exercise.

**STROKE RECOVERY**

**GOAL**
Self-management of physical activity and exercise to promote:
- Fitness and health
- Independent daily function
- Safe mobility
- Community Engagement

**PATIENT & CAREGIVER NEEDS, RESOURCES, AND PREFERENCES**

Homebound
Able to leave home and safe with mobility

Inform your client: Just 10 minutes of continuous physical activity at a time is beneficial to your health.
Service Referrals and Transitions

See algorithm below for aligning your client’s physical impairments with the appropriate service point and for key indicators of when transition to the next service point is appropriate along the continuum of stroke recovery.

<table>
<thead>
<tr>
<th>STROKE RECOVERY AFTER HOSPITAL DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HOME HEALTH</strong></td>
</tr>
<tr>
<td>• ↓ Strength arm &amp; leg</td>
</tr>
<tr>
<td>• Impaired Mobility</td>
</tr>
<tr>
<td>• Impaired Balance</td>
</tr>
<tr>
<td>• ↓ Coordination</td>
</tr>
<tr>
<td>• ↑ spasticity</td>
</tr>
<tr>
<td>• Impaired ADL’s/IADL’s</td>
</tr>
<tr>
<td>• Cognitive deficits</td>
</tr>
<tr>
<td>• Speech/swallowing deficits</td>
</tr>
<tr>
<td><strong>OUTPATIENT</strong></td>
</tr>
<tr>
<td>• ↓ Strength arm &amp; leg</td>
</tr>
<tr>
<td>• Impaired Mobility</td>
</tr>
<tr>
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<tr>
<td>• Speech/swallowing deficits</td>
</tr>
<tr>
<td><strong>COMMUNITY PROGRAMS</strong></td>
</tr>
<tr>
<td>• Fall Risk</td>
</tr>
<tr>
<td>• Impaired cardiovascular fitness</td>
</tr>
<tr>
<td>• Residual strength &amp; balance deficits</td>
</tr>
<tr>
<td>• Not in need of therapy services</td>
</tr>
<tr>
<td>• Lack the resources for therapy services</td>
</tr>
<tr>
<td><strong>SELF-MANAGEMENT</strong></td>
</tr>
<tr>
<td>• Maintain balance to prevent falls</td>
</tr>
<tr>
<td>• Maintain cardiovascular fitness to prevent secondary stroke</td>
</tr>
<tr>
<td>• Maintain physical activity &amp; exercise for health and well-being</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPAIRMENTS</th>
<th>REFERRAL &amp; ACCESS ISSUES</th>
<th>TRANSITION TO NEXT SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOME HEALTH</td>
<td>• Meets homebound criteria</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MD referral needed (PT, OT, ST)</td>
<td></td>
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<tr>
<td></td>
<td>• Has payer or self-pay</td>
<td></td>
</tr>
<tr>
<td>OUTPATIENT</td>
<td>• MD referral needed for most insurance (PT, OT, ST)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Has payer or self-pay</td>
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<tr>
<td></td>
<td>• Reliable transportation</td>
<td></td>
</tr>
<tr>
<td>COMMUNITY PROGRAMS</td>
<td>• Patient/caregivers are independent with home exercise programs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Maximized progress with formal therapy goals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Short Physical Performance Battery ≥10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gait Speed ≥ 0.6 m/sec for safety in community</td>
<td></td>
</tr>
<tr>
<td>SELF-MANAGEMENT</td>
<td>• Maximized progress in program</td>
<td></td>
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<tr>
<td></td>
<td>• Patient prefers self-management</td>
<td></td>
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<tr>
<td></td>
<td>• Patient needs a safe place to exercise at home or the gym</td>
<td></td>
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<tr>
<td></td>
<td>• Patient needs to demonstrate safety awareness</td>
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</tbody>
</table>

Visit the COMPASS Resource Directory to find Home Health, Outpatient Rehabilitation, and community-based programs in your area. https://www.nccompass-study.org/

Inform your client: Movement matters for recovery of fitness and health.
Community-Based Resources

❖ Community-Based Exercise Programs

- Support a stroke survivor by:
  - Encouraging physical activity and exercise
  - Providing social engagement
- Are offered in a variety of settings: fitness center, recreation center, senior center, or a hospital-based wellness program.
- The YMCA and YWCA are especially supportive of survivors, since they tend to offer classes geared toward seniors and those with physical limitations and provide opportunities for social engagement.

Visit the COMPASS Community Resource Directory to find a community-based exercise facility in your area: [https://www.nccompass-study.org/patients-and-caregivers/](https://www.nccompass-study.org/patients-and-caregivers/)

❖ Senior Fitness Programs and Benefits

- Senior fitness programs such as SilverSneakers® and Silver&Fit® are health benefits that are covered by many Medicare plans. This benefit can cover the cost of a gym membership or fitness classes at a participating location. Encourage survivors with Medicare to check on if their plan provides this benefit.
- Programs are generally taught by fitness coaches trained to address and be sensitive to the unique fitness needs of older adults. These classes feature modifications of exercises so that those with physical limitations can still be actively involved in the fitness class. Although geared toward seniors, classes are open to all adults and can be helpful for younger survivors with reduced functional level.

For information on benefits and participating locations, visit:
SilverSneakers®: [https://www.silversneakers.com](https://www.silversneakers.com)  Silver&Fit® [https://www.silverandfit.com](https://www.silverandfit.com)

❖ Falls Prevention Programs

- Offer evidence-based exercises and/or strategies to help prevent falls. Programs like A Matter of Balance or Moving for Better Balance® are evidence-based exercise programs that provide individuals with strategies for improving balance and preventing falls.
- Are taught by certified instructors in various locations (recreation centers, community centers, or senior centers) across the state.

Visit the COMPASS Community Resource Directory to find an evidence-based falls prevention program in your area: [https://www.nccompass-study.org/patients-and-caregivers/](https://www.nccompass-study.org/patients-and-caregivers/)

Or visit the North Carolina Falls Prevention website for more information about Falls Prevention Programs across the state: [http://www.injuryfreenc.ncdhhs.gov/resources/FallsCoalition.htm](http://www.injuryfreenc.ncdhhs.gov/resources/FallsCoalition.htm)

Inform your client: Recovery is a process that can take years and the potential for gains do not cease, as long as you continue to move and strive to increase your physical activity.