FOUNDATIONS OF

OCCUPATION-BASED STROKE REHABILITATION

A CLINICAL DECISION GUIDE

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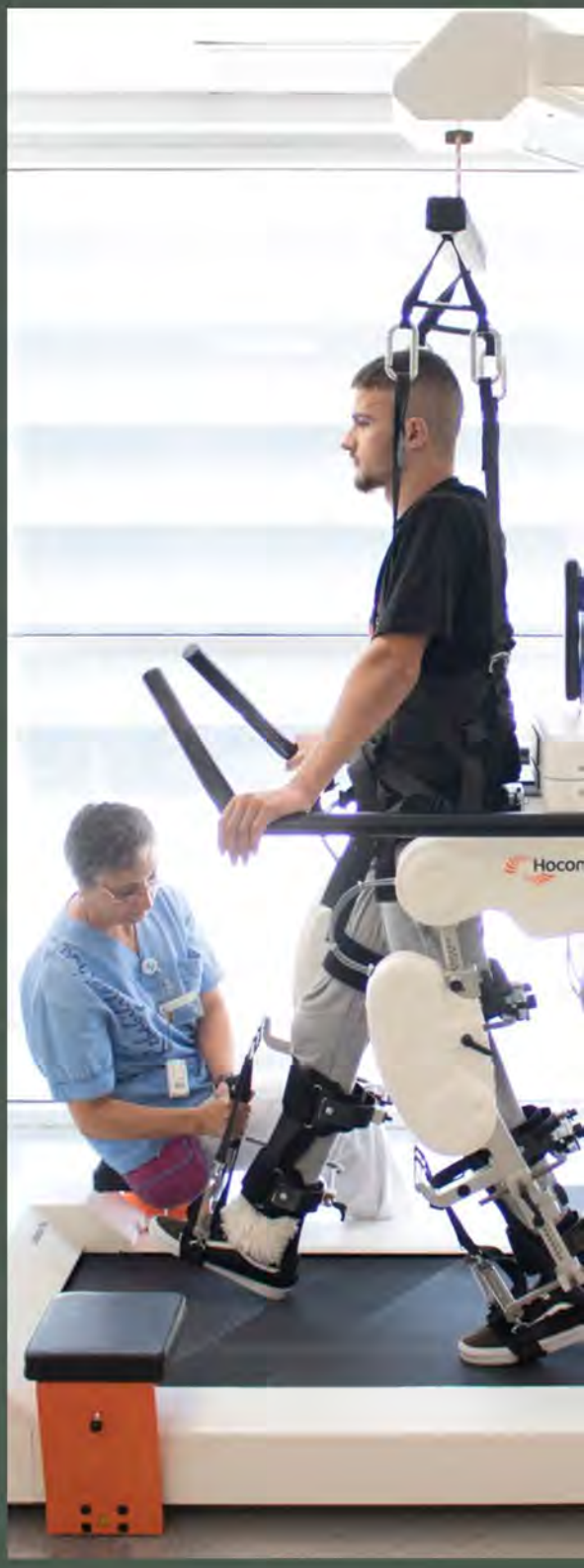
PURPOSE & EMPHASIS

The primary purpose of this manual is to serve as a decision-support and reference resource for occupational therapy practitioners working with individuals post-stroke. Rather than providing typical protocols, while still undoubtedly effective, the manual presents frameworks, guiding principles, and adaptable intervention strategies designed to facilitate evidence-based clinical decision-making abilities. Through the integration of theoretical principles, clinical reasoning frameworks, and practical examples, the manual looks to assist emerging practitioners in selecting, grading, and adapting interventions. These have the potential to be tailored towards individual or group goals, environmental contexts, and functional needs while still aligning with the best-practice standards within occupational therapy.



Again, this manual is intended for supplemental use in clinical planning, supervising, and/or fieldwork education. Practitioners are encouraged to utilize the content to generate intervention ideas, support treatment plan discussions, and reflect on the clinical reasoning processes. As the nature of stroke recovery is inherently complex and individualized, the manual emphasizes the importance of clinical judgement. Readers should evaluate each intervention example and framework, adapt the strategies to client goals, and assess the environmental contexts of their individual clients before integrating them. The manual is not a replacement for professional training or supervision. It is a tool to assist decision making, enhance professional confidence, and support safe and occupation-based outcomes.

HOW TO USE THIS MANUAL

This manual is intended for new graduates and emerging occupational therapy practitioners (OTPs) seeking to develop competence and confidence in the occupation-based intervention planning for individuals recovering from a stroke. It is specifically tailored to support clinicians who possess foundational knowledge of stroke-related impairments but are refining their ability to translate these impairments into occupation-based and client-centered interventions.

The manual recognizes the variability that exists within post-stroke presentations and recovery timelines. Materials within the manual are intended for practitioners navigating complex cases across diverse practice settings such as acute care, inpatient rehabilitation, subacute/extended recovery units, outpatient, home health and community-based options. Its structure supports emerging clinicians in cultivating effective clinical reasoning while still promoting safe, functional, and meaningful outcomes for the clients.



SCOPE & LIMITATIONS

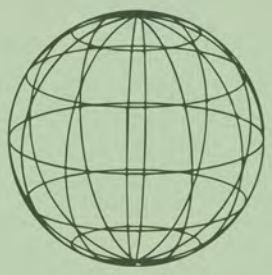
This manual is designed to support occupational therapy practice with the adult populations recovering from stroke. The primary emphasis is on facilitating functional participation, independence, and meaningful engagement for clients in their daily lives. The content focuses on occupation-based stroke recovery with interventions that integrate client-centered goals, everyday routines, and occupations rather than solely targeting impairments alone. By centering therapy services on occupations, practitioners are encouraged to foster real-world functional gains and promote engagement in roles, routines, and habits that are personal to each client.

While the manual emphasizes the application of occupation-based principles across the continuum of stroke care, particular attention is given to the chronic (over six months post-stroke) and subacute (between three to six months post-stroke) stroke considerations (Grefkes & Fink, 2020). Clients in these stages often demonstrate varying recovery processes, persistent impairments, and unique recovery priorities. Due to this, interventions must be adaptive by addressing not only residual impairments but also environmental challenges, psychosocial needs, and the client's long-term goals (Bayazeed et al., 2024). The manual acknowledges that recovery beyond six months is often nonlinear and requires practitioners to use clinical reasoning that prioritizes, modifies, and progresses activities to align with clients' contextual demands

The manual also notes the variability that is present across clinical settings, client presentations, and available resources. This variability promotes the need for flexibility, creativity, and effective reasoning when translating the manual's guidance into clinical practice. It is also important to note that this manual is not intended to be a protocol that is followed to the exact step. Instead, it will provide frameworks, decision-making tools, and adaptable intervention examples to guide emerging practitioners in applying evidence-based and occupation-based strategies.

The examples presented are illustrative and meant to be adapted based on the practitioner's clinical judgement, the client's individual goals, and the relevant contexts of the practice setting. Practitioners are encouraged to critically evaluate each suggested intervention and protocol to determine the alignment to their clients' preferences, capacities, and occupational outcomes.

Finally, practitioners are encouraged to integrate facility policies, supervision, and evidence-based practice when applying strategies from this manual. All interventions should align with the respective institution's guidelines, safety standards, and expectations of supervising clinicians. By combining the guidance in this manual with strong mentorship, peer consultation, and current evidence, emerging practitioners can enhance both the efficacy and safety of their interventions while promoting meaningful participation for clients recovering from a stroke.



SECTION I:

THEORETICAL FRAMEWORKS & PRINCIPLES OF STROKE REHABILITATION



WHY USE THEORIES?

Occupational therapy practice is grounded in theory that guides practitioners' clinical reasoning, evaluation, and intervention planning during the rehabilitation process. This manual is guided by these well-established, occupation-based frameworks that provide structure to support individuals recovering from a stroke. These frameworks emphasize the integration of meaningful activity, client-centered goal setting, and functional participation, allowing emerging practitioners to translate the theoretical principles into practical interventions. The following models are the most integral in the creation of this manual

Guiding Questions:

Step 1: Identify Occupational Goal

What meaningful activity is the client struggling to perform?

- What occupations are most important?
- Which roles, routines, or habits are disrupted?
- What does the client want to return to?

Step 2: Identify Primary Participaton Barrier

Determine the **type** of problem that is limiting occupational performance.

- Does the client have the physical capacity to complete the task?
- Can the client understand/ organize steps of the task?
- Does the client believe they can perform the task?
- Does the environment support/ hinder the occupation?

Step 3: Select the Model- "Why"

Conceptual structure for understanding client challenges & guide intervention focus

- What is the interaction between the person, environment, and occupation?
- Which occupations/strategies are meaningful to the client?
- How to client goals/motivations/ contexts shape ther perpestive?

Step 4: Select the Frame of Reference- "How"

Practical strategies to target impairments, skills, & participation limitations

- Restorative, adaptive, or compenatory?
- How are movement, cognitive, or psychosocial skills structured?
- Grading, adaptation, and assistive technology needed

OT MODELS

Occupational therapy practice is grounded in theory that guides practitioners' clinical reasoning, evaluation, and intervention planning during the rehabilitation process. This manual is guided by these well-established, occupation-based frameworks that provide structure to support individuals recovering from a stroke. These frameworks emphasize the integration of meaningful activity, client-centered goal setting, and functional participation, allowing emerging practitioners to translate the theoretical principles into practical interventions. The following models are the most integral in the creation of this manual



OCCUPATION-BASED MODELS GUIDING STROKE RECOVERY

	CO-OP	MOHO	PEOP
Primary Focus	Occupational performance → cognitive strategy use	Occupational Identity, roles, habits, & lived experiences	Fit between person, environment, occupation, and performance
Clinical Lens	Strategy-based skill attainment	Volition, habituation, performance capacity	Ecological and systems-based analysis
Impairment Perspective	Addressed within task performance via strategy use	Integrated into performance capacity (objective & subjective)	One intrinsic factor interacting with contextual demands
Goal Development	Client-selected, measurable, functional goals	Goals shaped by values, identity, and routine reconstruction	Participation-driven goals within real-world contexts
Intervention Approach	Guided discovery, repetition, transferrable	Habit rebuilding, role re-engagement, graded participation	Modify person, task, or environment to optimize performance fit
Stroke Application	Subacute/Chronic phases, emphasize self-management & generalization	Across continuum, especially for psychosocial adjustment	Across continuum, especially for discharge and community reintegration

Cognitive Orientation to Daily Occupational Performance

OT MODELS

The CO-OP model provides a strong theoretical framework for an occupation-based stroke recovery process due to the explicit focus on meaningful activities, client-centered goals, and the development of clinical reasoning skills (Kiriakou & Psychouli, 2024). Occupational performance is prioritized in this model rather than an explicit focus on impairments, aligning directly with the purpose of this manual to support decision-making skills. One of the primary strengths of the CO-OP model is the emphasis on client-selected goals and individualized problem solving (Valera-Gran et al., 2024).

Stroke recovery varies for each individual as they can present with diverse combinations of motor, cognitive, perceptual, and psychosocial factors that impact their daily occupational performance. The CO-OP model acknowledges this variability by encouraging adaptable strategies throughout recovery that fit the client's personal and environmental contexts (Valera-Gran et al., 2024).

This model also aligns with best practice in OT through the emphasis on clinically meaningful change in occupational performance. Research examining CO-OP interventions in adult stroke populations has demonstrated that improvements in engagement are perceived as meaningful for clients, even if standardized significance is not consistent (Kiriakou & Psychouli, 2024). This distinction between standardized outcomes and clinical significance reinforces the value of occupation-centered approaches that prioritize the client's functional independence, participation, and quality of life.

Another key feature of the CO-OP model is the focus on skill transfer and generalization beyond trained tasks. The model's specific emphasis on cognitive strategy use and problem-solving strategies supports carryover of skills into daily routines with the repetition during practice (Kiriakou & Psychouli, 2024). For emerging practitioners, clinical decision making in client experience and real-world performance is increasingly important rather than solely standardized outcomes in stroke recovery.

Finally, the CO-OP model is particularly well suited for individuals in the subacute and chronic phase of stroke recovery. During these phases, long-term adaptation, self-management, and participation are central therapeutic goals and priorities for those recovering from a stroke (Grefkes & Fink, 2020). As clients continue to transition further from intensive rehabilitation services, the model emphasizes guided discovery and strategy creation to support autonomy and continued engagement in meaningful occupations (Valera-Gran et al., 2024).

For practitioners, the development of clinical reasoning skills is supported significantly by the CO-OP model. It encourages reflection on client progress, hypothesis testing, and adaptive strategies that fosters confidence in navigating complex cases (Kiriakou & Psychouli, 2024). Rather than offering a standardized solution, the CO-OP model complements this manual's purpose as an adaptable, evidence-based guide to support occupation-based clinical decision making for stroke recovery.

Model of Human Occupation (MOHO)

OT MODELS

The Model of Human Occupation (MOHO) provides a comprehensive and occupation-based framework that strongly supports this manual. It emphasizes dynamic interaction between the individual, their occupations, and the environment which directly correlates with the complex stroke recovery process (Cheung & Fung, 2020). This model guides practitioners to move beyond any impairment-focused treatment and consider how volition, habituation, performance capacity, and environmental context influences occupational engagement following a stroke. Volition is important within this model because it takes into consideration the values, personal causation, and interests that are typically disrupted after a stroke (Cheung & Fung, 2020).

The selection of meaningful occupations that target specific motivation for the individual client is crucial for the recovery process, which is embedded deeply in the MOHO model. Habituation contributes to the many changes that an individual faces when engaging in their daily routines when comparing their previous patterns. By supporting the reconstruction of clients' habits and roles, practitioners can focus on long-term adaptations and participation in occupations (Cheung & Fung, 2020).

In addition, performance capacity within MOHO encompasses both the objective performance skills of the client and the subjective experience of those skills. This focus contributes to the complexity of stroke recovery since observable motor or cognitive impairments may not capture the individual's perceived confidence in their engagement (Cheung & Fung, 2020).

By addressing both aspects of performance capacity, MOHO supports the advanced clinical reasoning needed to grade activities that is utilized throughout the manual. Finally, environmental factors play a critical role in MOHO and contribute to the diverse setting that stroke survivors are seen in, including inpatient, outpatient, home-based, and community environments. MOHO emphasizes that occupational performance is shaped by the physical, social, cultural, and institutional contexts of an individual's life (Cheung & Fung, 2020). This perspective reinforces the manual's diversity in resources to take into account the various facility policies and practice expectations of the settings that it could be implemented in.

Overall, MOHO supports the use of structured observation, client-reported measures, and reflective clinical reasoning to guide the evaluation and planning of interventions. The outcome measures utilized within this model help to inform decision-making skills and monitor meaningful changes in a client's recovery process (Bosch & St. Germain, 2018).

Assessments and observational frameworks can be integrated along other occupation-based measures as well to emphasize the holistic perspective of client progress. For emerging practitioners, MOHO offers a clear structure to organize clinical reasoning skills in a manner that respects the complexity of stroke recovery, making it an appropriate theoretical foundation for this manual.

Person-Environment-Occupation-Performance (PEOP)

OT MODELS

The Person-Environment-Occupation-Performance (PEOP) model provides a detailed framework to support occupation-based stroke rehabilitation by emphasizing the dynamic interaction between personal factors, environmental contexts, and meaningful occupations (Ystaas & Raymond, 2019). Stroke events frequently result in changes to physical, cognitive, emotional, and social factors that alter an individual's ability to engage in previously valued roles and routines.

The PEOP model encourages practitioners to analyze occupational performance as a product of the interaction between the individual and the environment, not solely on their impairments (Lee et al., 2017). This perspective aligns directly with the purpose of this manual that promotes flexible, context-sensitive clinical reasoning rather than protocol-driven interventions.

Within the PEOP framework, intrinsic factors like motor control, cognition, psychosocial resilience, and motivation are considered alongside the extrinsic factors like physical space, social support, and institutional policies (Ystaas & Raymond, 2019). This dual focus is particularly relevant in subacute and chronic stroke recovery where long-term engagement is influenced by the addressing of impairments in addition to the environmental accessibility, caregiver support, and role identification (Lee et al., 2017).

This manual's emphasis on adaptive strategies, assistive technology, and graded occupational engagement reflects the PEOP model's recognition that modifying environmental demands can be equally as therapeutic and meaningful for clients recovering from a stroke.

Importantly, PEOP reinforces OT's distinct focus on participation and quality of life during the rehabilitation process. By centering performance on the meaningful occupations the client values as the overall outcome, the model supports this manual's prioritization of client-selected goals, contextual relevance, and sustainable engagement in occupations across various settings.

For emerging practitioners, PEOP offers a clear structure for organizing assessments and interventions while remaining aware of the diversity within an individual's recovery process (Ystaas & Raymond, 2019). In this way, the model strengthens the manual's role as a decision-support guide that is grounded in holistic, occupation-centered practice.

OT FRAMES OF REFERENCE

Occupational therapy frames of reference (FORs) provide practical guidance that allows practitioners to translate the previously discussed theories into assessment and intervention strategies (Kielhofner, 1997). While theoretical models describe the overarching principles, FORs offer structured approaches to address specific impairments, skills, and functional limitations (Kielhofner, 1997). This manual incorporates several evidence-based FORs commonly applied in stroke rehabilitation. The following support emerging practitioners to implement occupation-based interventions safely and effectively with clients



OT FRAMES OF REFERENCE GUIDING STROKE RECOVERY

	NDT	Motor Learning	Cognitive-Behavioral	Bio-mechanical
Primary Target	Postural control, tone regulation, movement quality	Skill acquisition/ retention through task-specific practice	Thoughts, emotions, beliefs, & regulation influencing participation	Strength, ROM, endurance, structural capacity
Theoretical Basis	Neuro-plasticity& sensorimoto r integration	Motor control theory, neuroplasticity, practice conditions	Cognitive restructuring, behavioral activation, self-efficacy theory	Musculo-skeletal and kinesiological principles
Intervention Style	Guided handling, alignment, facilitation within a task	Repetition, variability, feedback, modulation, error based learning	Guided discovery, graded exposure, reflective processing	Graded resistance, endurance training, activity tolerance progression
Role in Occupation-Based Practice	Optimizes movement efficiency during functional tasks	Structure client's practice conditions to promote generalization	Addresses psychosocial barriers limiting engagement	Builds physical capacity required for meaningful occupations
Stroke Application	Acute to subacute phases; movement pattern retraining	Across continuum, especially for carryover into daily routines	Subacute and chronic for identity, confidence, & adaptation	Across continuum, foundational for ADL/IADL tolerance

Neurodevelopmental Treatment (NDT) FOR

OT FRAMES OF REFERENCE

Neurodevelopmental Treatment (NDT) is a frame of reference (FOR) most commonly applied in stroke rehabilitation to address impairments in postural control, tone regulation, and movement coordination through guided handling, facilitation, and task-specific alignment strategies (Pathak et al., 2021). This FOR is rooted in principles of neuroplasticity and sensorimotor integration by emphasizing the quality of movements, trunk control, and overall proximal stability to support distal mobility (Pathak et al., 2021). In adults post-stroke, abnormal tone, learned nonuse, and compensatory movement patterns may limit functional recovery; however, NDT-informed approaches aim to optimize the alignment and efficiency of movement to improve participation in meaningful activities (Studnicki et al., 2025).

Currently, rehabilitation guidelines emphasize active engagement, repetition, and functional relevance as key factors to support neuroplasticity, reinforcing the need to embed NDT principles into occupation-based tasks (Studnicki et al., 2025). Although recent literature suggests that NDT should not be implemented as a sole approach, there is evidence that supports the integration of task-specific, goal-directed movement practice with strategies for postural facilitation (Studnicki et al., 2025).

This aligns with the manual's emphasis on functional protocols that prioritize meaningful activity while still addressing the biomechanical and neurorehabilitation foundations. Within the manual, NDT principles inform the intervention planning related to trunk activation during seated ADLs, weight shifting during tasks, and graded upper extremity use within relevant occupations for clients.

Instead of identifying specific handling techniques, this manual will encourage practitioners to apply NDT-informed reasoning when analyzing movement patterns. This facilitates more efficient motor patterns during real world activities and allows NDT to function within occupation-based interventions to maximize functional independence (Pathak et al., 2021).

Motor Learning FOR

OT FRAMES OF REFERENCE

Motor learning principles are foundational to stroke rehabilitation and are strongly supported throughout neurorehabilitation literature. This approach emphasizes task-specific practice, repetition, feedback modulation, and the conditions where these skills can be retained (Koch et al., 2026). Following a stroke, recovery of functional movement is influenced by intensity, variability of practice, and opportunities for problem-solving within the task (Koch et al., 2026).

Motor learning theory reinforces that durable skill acquisition occurs when individuals actively engage in meaningful tasks rather than being passively facilitated. Evidence also suggests that distributed practice, contextual variability, and reduced reliance on external feedback enhance skill retention and transference (Koch et al., 2026). This is particularly relevant in the chronic phase of stroke recovery where generalization beyond the structured therapy setting is a primary goal.

When applying these, motor learning principles guide how interventions are structured within the manual's sample protocols. The manual integrates these by encouraging graded repetition within the occupation-based examples, structured progression of task demands, and intentional fading of cues to promote independence. For example, repetition within meaningful instrumental activities of daily living (IADLs), varied environmental contexts, and opportunities for error detection are intentionally embedded into the sample interventions.

Rather than focusing on only task completion, practitioners are encouraged to consider how practice conditions influence long-term performance. As a result, motor learning provides the backbone of intervention design within the manual that ensures that occupation-based activities are structured to maximize neuroplasticity and skill carryover.

Cognitive-Behavioral FOR

OT FRAMES OF REFERENCE

The Cognitive-Behavioral FOR addresses the interaction between thoughts, emotions, behaviors, and occupational engagement (Moursey et al., 2025). After a stroke, individuals commonly experience decreased self-efficacy, fear of falling, anxiety related to their performance, depression, or maladaptive beliefs about their recovery potential. These psychosocial and cognitive factors can significantly influence their participation outcomes outside of their motor performance (Moursey et al., 2025).

Cognitive-behavioral principles support the identification and restructuring of maladaptive beliefs while still promoting adaptive coping strategies and behavioral activation (Moursey et al., 2025). Evidence in stroke rehabilitation supports interventions that enhance self-efficacy, problem-solving skills, and emotional regulation as main factors to improve confidence and quality of life (Moursey et al., 2025). Approaches such as guided discovery, graded exposure, and structured reflection all align with occupation-based practice and promote engagement in meaningful activities.

Addressing psychosocial barriers to participation is particularly important in chronic stroke recovery as long-term adaptation and identity reconstruction are central to therapeutic progress for the client. Within this manual, cognitive-behavioral principles are integrated into goal development, reflective prompts, and case-based clinical reasoning sections (Moursey et al., 2025).

Practitioners are encouraged to consider how anxiety, avoidance, or reduced confidence may influence occupational performance. Additionally, incorporating supportive strategies into intervention planning allows for practitioners to further address their clients' needs. By addressing both physical and cognitive-emotional dimensions of recovery, this FOR strengthens the manual's holistic and participation-centered approach.

Biomechanical FOR

OT FRAMES OF REFERENCE

The Biomechanical FOR focuses on improving strength, range of motion, endurance, and structural alignment to support functional performance (Tsiakiri et al., 2024). Following a stroke, impairments such as muscle weakness, decreased joint mobility, reduced activity tolerance, and postural instability directly limits occupational engagement. Biomechanical principles support graded activity, positioning strategies, and endurance-building interventions that enhance the physical capacity required for meaningful tasks (Tsiakiri et al., 2024).

While the sole use of biomechanical interventions may not address the complexity of stroke recovery, evidence supports incorporating strengthening and endurance training with task-oriented practice to improve activity of daily living (ADL) performance (Montoya et al., 2022). The research of neurorehabilitation emphasizes that strengthening is most effective when embedded within functional activities rather than isolated muscle targeting and practice (Montoya et al., 2022).

This reinforces the manual's consistent emphasis on occupation-based implementation rather than sole remediation of motor capabilities. The biomechanical principles guide the grading of physical demands within its sample protocols, including the modification to tasks, resistance, duration, and repetition (Montoya et al., 2022).

These principles also inform safety considerations, energy conservation strategies, and progressive muscle loading during IADLs and leisure activities. By integrating biomechanical reasoning into occupation-centered interventions, practitioners can address physical capacity while maintaining the meaningful and client-directed focus that defines this guide.

TOP-DOWN VS. BOTTOM-UP DECISION MAKING

Identify meaningful occupations and participation goals

- What does the client want or need to do?
- What roles or daily routines are affected?

⬇

Analyze occupational performance limitations

- Where is participation breaking down?
- Which parts of the activity are difficult?

⬇

Determine contributing performance factors

- Motor control
- Strength/endurance
- Tone or coordination
- Cognition or attention
- Sensory processing

Are underlying impairments limiting occupational performance?

YES

⬇

Integrate Bottom-Up Strategies

- Address underlying performance components such as:
  - UE strengthening
  - Motor control training
  - Cognitive strategy training
  - Endurance or coordination practice

⬇

Link impairment intervention back to occupation

- Example: Strengthening UE leads to improved meal preparation

⬇

Reassess occupational performance

⬇

Adjust intervention using both approaches

NO

⬇

Continue Top-Down Occupation-Based Intervention

- Examples: Task-specific training, Practice meaningful ADLs/IADLs, Context-based activity training

⬇

Monitor participation outcomes

GRADING VS ADAPTATION VS COMPENSATION IN PRACTICE:

- The overall clinical objective is to select intervention strategies that align with recovery potential, safety, fatigue level, and client priorities, and continue to analyze these throughout the intervention process (Hildebrand et al., 2023).
    - *Grading: Restorative Emphasis*
        - When the client is demonstrating emerging voluntary movement, when motor control is inconsistent but present, or when there is potential for increased motor output with repetition and feedback.
        - How to grade: modify base of support (sitting vs. standing), adjust object characteristics (size, weight, resistance, etc.), decrease physical or verbal cueing, etc. within that session/activity
    - *Adaptation: Participation Emphasis*
        - When the client experiences increased pain, fatigue, or endurance, the goal of intervention is immediate occupational participation, or that task completion prioritizes movement patterns in that session.
        - What adaptations look like: environmental setup changes, task simplification, or external supports to reduce motor demand over long-term performance and engagement
            - Adaptation should increase independence without eliminating active effort from the client.

GRADING VS. ADAPTATION VS. COMPENSATION

Identify the occupational goal

What activity does the client want or need to do?

⬇

Determine the therapeutic priority

- Skill restoration
- Improving performance during activity
- Promoting independence despite persistent impairment

⬇

Decision Point

Is the goal to improve underlying skill or motor learning?

⬋ ⬊

YES

⬇

Use Grading

- Modify task demands to support progressive challenge
- Examples: Change level of assistance, Adjust resistance or weight, Increase or decrease task complexity, Modify cognitive load, Adjust duration or repetitions, Reduce or increase environmental distractions

⬇

Goal: Promote skill acquisition and neuroplasticity

NO

⬇

Decision Point

Is the client unlikely to regain previous levels of performance?

YES

⬇

Use Compensation

- Introduce alternative strategies or assistive methods
- Examples: One-handed techniques, Assistive devices or adaptive equipment, Energy conservation strategies, Task substitution

ENVIRONMENTAL VS. TASK VS. CLIENT MODIFICATIONS

Identify the occupational goal

- What activity does the client want or need to perform?
- What participation outcome is meaningful to the client?

⬇

Observe occupational performance

- Where is the activity breaking down?
- At what step does the difficulty occur?

⬇

Analyze barriers across three domains

- Client factors
- Task demands
- Environmental contexts

⬇

Decision Point

Are client factors primarily limiting performance?

- Examples of barriers: Strength deficits, Tone or coordination issues, Reduced endurance, Cognitive processing difficulties, Motivation or emotional factors

↙ ↘

YES

⬇

Implement Client-Level Interventions

- Examples: Strengthening exercises, Cognitive strategy training, Tone management, Endurance building, Motor control practice

⬇

Goal: Improve intrinsic abilities supporting occupational performance

⬇

Reassess task performance

NO

⬇

Decision Point

Is the environment creating barriers to participation?

- Examples of barriers: Unsafe physical layout, Poor lighting or visual clutter, Lack of assistive devices, Limited caregiver support

YES

⬇

Implement Environmental Modifications

- Examples: Rearrange furniture for safer mobility, Improve lighting, Reduce environmental distractions or clutter, Provide caregiver education, Introduce assistive devices

⬇

Goal: Improve safety and participation through contextual support

⬇

Reassess occupational performance

SECTION II:

FOUNDATIONS OF STROKE RECOVERY ACROSS THE CONTINUUM



DEFINITIONS

The following definitions are provided to clarify how key terms are used within this manual. While terminology in stroke rehabilitation may vary depending on location and setting, these definitions are intended to promote more consistent interpretation and application of the concepts presented throughout the manual.

01 OCCUPATIONS

Meaningful, goal-directed activities that individuals engage in as part of their daily lives. These activities are embedded within personal, social, cultural and environmental contexts and contribute to an individual's roles and participation. Within this manual, occupation refers to activities that hold personal relevance and support engagement in roles following a stroke. (AOTA, 2020)

02 OCCUPATIONAL PERFORMANCE

Refers to observable engagement in meaningful occupations within a specific context. It reflects the dynamic interaction between client factors, task demands, and environmental influences. In this manual, occupational performance is considered one of the primary outcomes of interventions and emphasizes functional participation. (AOTA, 2020)

03 PARTICIPATION

Involvement in daily tasks including roles, routines, and valued activities that extends beyond simply completing tasks. It encompasses quality of life, autonomy, and meaningful engagement within one's environment. In stroke rehabilitation, participation outcomes may include discharging to the home environment, community mobility, and leisure engagement. (AOTA, 2020; WHO, 2008)

04 ACUTE STROKE

Early phase post-stroke that occurs between 72 hours to three months after the event. This period is characterized by medical stabilization, rapid neurological changes, and early stages of rehabilitation interventions. (Grefkes & Fink, 2020)

DEFINITIONS (CONT.)

05 CHRONIC STROKE

The period of stroke recovery spanning starting at six months and continuing through the individual's life. While this definition aligns with common clinical conventions, recovery is recognized as non-linear and ongoing, justifying the large timeframe of this phase. Neuroplasticity adaptations and meaningful functional improvements remain possible well beyond the start of this phase. (Grefkes & Fink, 2020)

06 NEUROPLASTICITY

The brain's capacity to reorganize and form new neural connections in response to repetition and environmental demands. In stroke rehabilitation, neuroplasticity is influenced by intensity of the interventions, task specificity, and active engagement. (Puderbaugh & Emmady, 2023)

07 NEUROREHABILITATION

Therapeutic interventions designed specifically to support recovery, adaptation and participation following a neurological injury. In the context of stroke, neurorehabilitation integrates motor, cognitive, psychosocial, and environmental considerations to promote functional engagement. (Maier et al., 2019)



OVERVIEW OF STROKE RECOVERY ACROSS THE CONTINUUM

Stroke is classified into two primary types: ischemic and hemorrhagic.

- **Ischemic stroke:** when a cerebral arterial occlusion restricts blood flow to brain tissue
- **Hemorrhagic stroke:** blood vessel ruptures, leading to bleeding and intracranial pressure (Grefkes & Fink, 2020).
    - Both can result in motor, sensory, cognitive, perceptual, and psychosocial impairments that influence occupational performance (Grefkes & Fink, 2020).

Recovery is commonly described across three phases: (Grefkes & Fink, 2020)

- **Acute phase**: three days to three months post-stroke; focuses on medical stabilization, prevention of secondary complications, and early mobilization.
- **Subacute phase:** between three to six months post-stroke; intense rehabilitation due to the increased neuroplasticity potential.
- **Chronic phase**: 6 months and beyond; emphasizes continued functional independence, adaptation, and long-term participation in meaningful occupations.

Rehabilitation goals evolve constantly across the continuum in response to changing clinical needs:

- **Acute phase**: intervention priorities include positioning, prevention of contractures and skin breakdown, and initial functional assessments to gauge recovery potential (Maier et al., 2019).
- **Subacute phase:** restoration of motor control, cognitive retraining, & increased independence in ADLs through task-specific practice (Maier et al., 2019).
- **Chronic Phase**: community reintegration, environmental modification, and sustained self-management (Maier et al., 2019).

Across all phases, interdisciplinary collaboration among physicians, therapists, and support staff ensures the continuity of care & propels the client through their recovery (Hildebrand et al., 2023).

- OT plays a distinct role in translating impairment-level recovery into meaningful occupational engagement by supporting client roles, routines, and participation that are specific to the individual (Hildebrand et al., 2023).

ACUTE & SUBACUTE PHASE CONSIDERATIONS

Acute and subacute stroke phases generally encompass the period immediately following the cerebrovascular event through the first several months of recovery.

- Rehabilitation efforts focus on medical stability, prevention of secondary complications, and the gradual reintroduction of functional activity as the individual's tolerance improves.

OT practitioners play a critical role by evaluating early functional abilities, identifying safety concerns, & initiating participation in basic ADLs (Powers et al., 2019).

- Early engagement in rehabilitation = improved functional outcomes, reduced hospital length of stay, and increased independence during later stages of recovery (Langhorne et al., 2011).
- As clients progress through the subacute phase, therapy intensity often increases as individuals transition to inpatient rehabilitation, skilled nursing facilities, outpatient therapy, or home-based services.

Neurological recovery is influenced by spontaneous biological recovery & experience-based neuroplasticity.

- Early improvements may occur as cerebral edema decreases & neural pathways begin reorganizing following the initial injury (Puderbaugh & Emmady, 2023).
- Interventions: early mobilization, safe positioning, & prevention of secondary impairments (joint subluxation, contractures, pressure injuries, etc.)

Recovery progresses = shift toward more structured, task-specific practice to support motor learning and functional independence (Hatem et al., 2016).

- Clients may present with diverse impairments: motor deficits, altered sensation, cognitive/perceptual challenges, reduced endurance, & decreased safety awareness
- Clients & family members adjusting to the sudden changes associated with stroke
    - Makes education, caregiver training, & collaborative discharge planning essential

Addressing these factors early in the recovery process helps establish a strong foundation for continued rehabilitation and supports long-term participation across the continuum of care.

CHRONIC STROKE CONSIDERATIONS

Chronic stroke: the period beyond six months post-stroke

- Historically, rehabilitation efforts were concentrated before the six month mark based on the assumption that a majority of recovery occurs before this
  - BUT emerging evidence demonstrates meaningful gains occurring after this (Bayazeed et al., 2024).

Functional recovery: less focused on spontaneous recovery & more about structured motor learning, behavioral adaptation, & participation-based practice (Bayazeed et al., 2024).

- Many individuals report: long-term physical, social & occupational challenges → reduced community engagement, loss of valued roles, & disruption of daily routines (Boissoneault et al., 2020).
- Establishing specific routines & strategies into the client's occupations → identity reconstruction post-stroke, self-efficacy, and overall quality of life (Boissoneault et al., 2020).

Neuropolasticity = central mechanism to recovery.

- Rate of spontaneous recovery through neural reorganization may decrease over time, but the brain still retains the capacity for experience-based plasticity (Puderbaugh & Emmady, 2023).
- Motor learning theory also supports the use of graded challenges, problem-solving approaches, & client-centered goal setting
  - Optimizes learning opportunities that are meaningful, motivating, & embedded in real-world contexts (Hatem et al., 2016).

Despite this potential, there are several barriers that limit continued recovery.

- Post-stroke fatigue: one of the most frequently reported symptoms
  - contributes to learned nonuse (avoid using the affected limb due to early difficulties) & reinforces asymmetrical movement patterns (Li, 2023).
- Financial constraints, transportation limitations, caregiver burden, & psychosocial factors further complicate barriers (Li, 2023).

Chronic stroke should be conceptualized as an active process rather than a plateau phase to address the complexities specific to this phase across the lifespan.

ROLE OF OCCUPATIONAL THERAPY IN STROKE REHABILITATION

Occupational therapy addresses stroke recovery by integrating meaningful activities, environmental supports, habit formation, and self-management strategies tailored to the individual client. Intervention occurs across the continuum of care, with priorities shifting by setting while maintaining consistent occupation-based goals (Murrell et al., 2021).

STROKE REHAB ACROSS CARE SETTINGS

1. Acute Care:
    a. **Clinical goal**: Establish a foundation for recovery & safe transition of care
        i. Early mobilization, basic ADLs, prevent secondary complications
2. Inpatient Rehabilitation
    a. **Clinical goal:** increase functional independence & occupational performance
        i. Restoring ADL independence, motor recovery, task-specific practice
3. Outpatient & Home Health:
    a. **Clinical goal:** support participation in daily routines & home environments
        i. improving efficiency & safety, environmental modifications, return to roles
4. Community-Based Programs
    a. **Clinical goal:** Promote continued participation & long-term recovery
        i. health & wellness promotion, social participation, habit/ routine development

MAINTAINING CONTINUITY ACROSS CARE SETTINGS

Continuity of occupation-based goals is essential

OTs support this by:

- maintaining client-centered goals
- Linking interventions to meaningful daily activities
- Facilitating a smooth transition between care settings
- Promoting long-term participation

COMMUNICATING THE VALUE OF OT

Practitioners should emphasize that:

- engagement in meaningful occupations supports recovery
- occupation-based interventions promote long-term participation
- Client-centered care strengthens motivation & rehabilitation outcomes

Practitioners can deliver high-quality, occupation-centered care with structured tools & support



SECTION III:

COMMON IMPAIRMENTS & PARTICIPATION BARRIERS FOLLOWING STROKE



MOTOR IMPAIRMENTS

Motor impairments following stroke include hemiparesis, altered muscle tone, decreased coordination, reduced endurance, and impaired postural control (Fong et al., 2019). Upper extremity involvement is particularly impactful, as it directly affects dressing, grooming, meal preparation, work tasks, and community engagement (Hatem et al, 2016).

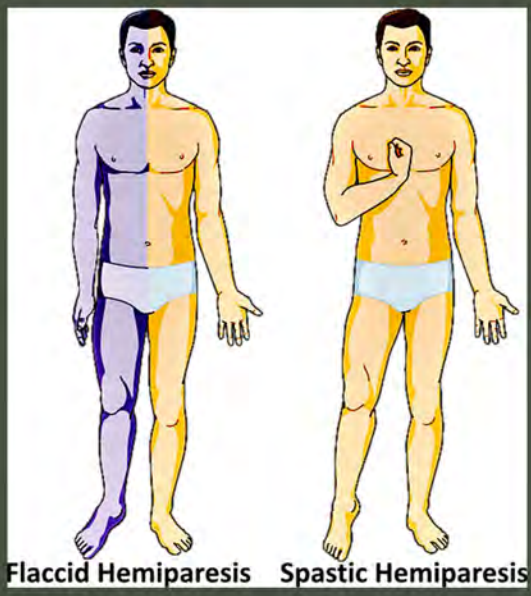


Changes in tone may range from flaccidity to spasticity in various phases of recovery, influencing movement quality and joint integrity (Fong et al, 2019). Decreased coordination and impaired motor planning can limit bilateral integration and fine motor precision, further affecting occupational performance in these categories (Fong et al., 2019).



Additionally, trunk control is foundational for postural stability, balance, and upper extremity function. It impacts reaching, ADL performance, & safety during transfers, and may present as poor midline orientation, decreased weight shifting, or compensatory trunk movements (Hatem et al, 2016).

The limitations that affect motor planning and engagement directly impact the daily routines of the clients recovering from a stroke.



See Appendix A for instructions and a template for a resting hand split.
See Appendix B for further information on trunk control assessment and interventions.

COGNITIVE, PERCEPTUAL & VISUAL CHANGES

Cognitive impairments are highly prevalent following stroke and may affect attention, sequencing, memory, processing speed, and executive function (Hildebrand et al., 2023). Sustained and divided attention limitations can interfere with task completion and safety, particularly in dynamic environments like kitchens and community settings.

Executive dysfunction may manifest as difficulty planning, problem solving, initiation, or self-monitoring, significantly impacting independent living (Hildebrand et al., 2023). These changes may not always be immediately apparent but can profoundly impact occupational performance and safety. OT assessment and intervention should integrate cognitive demands into real-world tasks rather than addressing them solely through exercises alone.





Similarly, perceptual and visual impairments like unilateral neglect, visual field cuts, impaired depth perception, and difficulties with spatial relations are common and underrecognized barriers to participation (Hildebrand et al. 2023). Individuals with unilateral spatial neglect may fail to attend to one side of their environment or body, increasing fall risk and reducing independence in self-care (Esposito et al., 2021).

Visual field cuts, such as homonymous hemianopsia, can interfere with reading, navigation, and community mobility. Impairments like these frequently require both restorative approaches and compensatory strategies, including environmental modification and scanning training (Esposito et al., 2021). Integrating perceptual retraining within meaningful occupations enhances generalization and functional carryover.

COMMUNICATION CONSIDERATIONS

Communication limitations are common following stroke and may significantly affect an individual's ability to participate in daily activities, social interactions, and healthcare decision making.

These impairments often arise from damage to language-processing regions of the brain and can manifest in several forms, including: aphasia, dysarthria, or apraxia of speech (Lanyon et al., 2024).

- **Aphasia**: ability to understand or produce language; may impact speaking, reading, writing, & comprehension.
- **Dysarthria**: weakness or incoordination of the muscles used for speech which often leads to slurred or slowed verbal output.
- **Apraxia** of speech: difficulty planning & sequencing motor movements for speech production

These communication challenges can significantly influence occupational performance by limiting the individual's ability to express needs, participate in conversations, and engage in meaningful social roles (Lanyon et al., 2024).

Communication impairments can also contribute to frustration, social withdrawal, and reduced participation in community activities if appropriate supports are not implemented (Lanyon et al., 2024).



OT practitioners frequently collaborate with speech-language pathologists to address communication-related barriers that influence participation in everyday activities (Dubach & Tripathi, 2023).

OT practitioners may incorporate: (Lanyon et al., 2024)

- simplifying verbal instructions
- using visual supports or written cues
- allowing additional response time
- encouraging alternative communication methods.

By recognizing the functional implications of communication impairments and integrating supportive strategies, practitioners can help clients maintain autonomy, improve social engagement, and support overall participation in meaningful activities.

PSYCHOSOCIAL, FATIGUE, AND SAFETY CONSIDERATIONS

Stroke frequently affects emotional regulation, identity, and overall psychological well-being.

- Depression, anxiety, reduced self-efficacy, and adjustment difficulties are common as many experience a disruption in valued roles and routines → decreased motivation and participation.(Campos et al., 2019)

- Emotional changes: insight, judgement, & willingness to attempt complex tasks

- Post-stroke fatigue: reduces endurance, impairs attention, and limits sustained participation (Chen et al., 2023)

- Impaired safety awareness, reduced insight, or decreased judgement can increase fall risks & influence tolerance, independence, and quality of life (Grefkes & Fink, 2020).





OT intervention

- address through energy conservation strategies, pacing education, environmental adaptation, graded activity engagement, and support for role reconstruction (Ahn et al., 2017).

Meaningful occupation can serve as both a therapeutic tool and a protective factor, supporting emotional adjustment and sustained participation. Recognizing the dynamic interaction between psychosocial health, fatigue, pain, and safety is essential for designing interventions that are client-centered and sustainable.

FAMILY DYNAMICS

Following a stroke, changes in physical, cognitive, and emotional functioning often affect not only the client, but those around them as well. When family members are involved in a stroke survivor's recovery, they frequently assume new caregiver responsibilities while simultaneously adjusting to changes in roles, routines, and expectations. These shifts can influence rehabilitation participation, access, and long-term community reintegration. OT practitioners should consider family dynamics as an important contextual factor that can either support or hinder occupational performance and stroke recovery.

Common Challenges in Family Roles: (Cejalvo et al., 2021)

- After a stroke, established family roles may shift unexpectedly, including:
  - Significant others assuming primary caregiving responsibilities
  - Adult children managing finances or medical decisions
  - Redistribution of household tasks
  - Changes in employment of caregiving schedules
- These changes can create stress, uncertainty, and role strain for both the client and their family members.

Clinical Considerations: Clients may struggle with loss of independence or identity when family members begin performing tasks that they previously completed independently. Psychosocial strategies may be helpful in addressing these struggles.

Over-Assisting vs. Under-Supportive Environments: (Jellema et al., 2017)

- Over-assistance: Family members may complete tasks for the client in an effort to help, which can sometimes lead to:
  - Limited opportunities for skill recovery in a functional context
  - Reduced client confidence in attempting past skills
  - Decreased independence for clients in daily activities and routines
- Under-support: In some situations, families may underestimate the level of assistance required, which can increase:
  - Safety risks, falls, medication errors, frustration for the client & their family



Clinical Considerations: OT practitioners play an important role in guiding families toward appropriate levels of assistance and support through handouts, education, and training sessions.

FAMILY DYNAMICS (CONT.)

Emotional and Psychosocial Impact (Jellema et al., 2017)

- Stroke recovery can create a significant amount of emotional adjustment for both the client and their family. They may experience:
  - Anxiety about safety and future health events that could occur
  - Grief related to changes in the stroke survivor's personality or abilities
  - Frustration related to cognitive or behavioral changes in their loved one
  - Uncertainty about long-term outcomes and their future routines

Clinical Considerations: Open communication and education about stroke recovery can help families to better understand expected changes and support the rehabilitation process.

When considering family dynamics, practitioners may ask the following questions:

1. Who will be the primary caregiver after discharge?
   a. *Many times, it is beneficial to identify a primary caregiver early on in the rehabilitation process not only as the point of contact but to mentally prepare themselves for the role before discharge.*
2. What expectations do family members have regarding recovery?
   a. *Family members may expect either very rapid recovery or very limited improvement from their loved ones. Understanding expectations allows practitioners to provide realistic education and align rehabilitation goals with the family's understanding.*
3. Are caregivers physically and emotionally prepared for their role?
   a. *Caregiving after a stroke may involve physical assistance, supervision, and emotional support. Assessing readiness helps identify risk for caregiver strain and determines whether additional services or supports are needed.*
4. Does the home environment support safe independence?
   a. *Environmental factors such as stairs, narrow spaces, bathroom setup, and lighting can significantly alter safety and independence. These factors can be identified through standardized assessments or simple interviews.*
5. What education or training would help the family feel more confident?
   a. *Family members often feel uncertain and hesitate to ask questions about how to help safely. Identifying their needs allows therapists to provide targeted caregiver training, safety strategies, and home program guidance.*

SECTION IV:

OCCUPATION-CENTERED INTERVENTION PLANNING



TRANSLATING EVALUATION TO OCCUPATION-BASED GOALS

The following assessment tools are a small selection of many that give context to a client's initial and future performance to help guide goal creation:

Quality of Life - Stroke Impact Scale (SIS):

- This assessment provides a client-centered measure of perceived health, participation, and quality of life across physical, emotional, cognitive, and social function. (Richardson et al., 2016)

Fine Motor- Fugl-Meyer Assessment of Motor Recovery after Stroke (FMA):

- The FMA is a standardized assessment that targets motor function, coordination, and dexterity of the upper extremities following a stroke. (de Blas-Zamorano et al., 2025)

Gross Motor- Modified Ashworth Scale:

- This assessment measures the muscle tone and spasticity in the upper and lower extremities which is essential for creating safe and relevant interventions. (Vidmar et al., 2023)

Cognitive- Mini-Mental State Examination:

- The Mini-Mental State Examination assesses global cognitive function, including orientation, attention, memory, and language, which are essential for safe and effective engagement in meaningful occupations (Gallegos et al., 2022).

Visual-Perceptual- Trail Making Test (TMT) Parts A & B:

- The TMT evaluates visual scanning, attention, cognitive flexibility, and processing speed to evaluate safety and efficiency in daily activities (Varjacic et al., 2018).

Please visit Stroke Engine for more information on these assessments and an extensive list of other relevant assessments!

TRANSLATING EVALUATION TO OCCUPATION-BASED GOALS

Writing participation-level goals:

- The use of client-centered goals that appropriately gauge the process that will be made is considered best practice. OTs can prioritize the expressed needs of the client while providing realistic insight to balance the expectations of the client with the attainable goals (Leonardi & Fheodoroff, 2021).
    - Additionally, ensure that the outcomes set for the client align with their environmental context and rehabilitation goals. If a client cannot appropriately express their rehabilitation goals, collaboration with family members, caregivers, and the interdisciplinary team is crucial in understanding the needs of the client (Leonardi & Fheodoroff, 2021).
    - Frequent reassessment of goals created during evaluation is necessary, especially early in stroke recovery, to ensure that the long-term goals match the performance and engagement that the client is expected to reach at discharge.

Selecting meaningful occupations:

- Link your biomechanical findings to the client's priorities and valued roles. For example, if a client experiences decreased shoulder flexion, find various, realistic tasks to replicate during OT that require this movement.
    - Utilize activity analysis to connect the client's valued occupations to the specific limitations they present with during the evaluation (Gomes et al., 2025).

CHOOSING INTERVENTIONS

Ongoing Decision Making Prompts:

1. Am I targeting recovery or participation?

   YES / NO

2. Does this client have potential for further motor restoration?

   YES / NO

3. Is fatigue limiting their movement patterns?

   YES / NO

4. What outcomes matter most to the client today?

STRUCTURING INTERVENTIONS

Balancing Repetition and Engagement:

- **The overall clinical goal of repetition**
  - To reinforce neuroplasticity through functional activities and emphasize continuous motivation during interventions (de Sousa et al., 2018).
    - Motor recovery requires high-volume, task-specific repetition, but repetition without meaning reduces engagement and carryover of skills
- **In Practice:**
  - Identify the primary movement component limiting the client's functional participation (ex. Shoulder flexion, trunk rotation, fine motor grasps)
  - Utilize occupations that naturally require the targeted movement.
  - Structure the session so that the client performs that movement 20-50+ times within the task (de Sousa et al., 2018).
  - Vary the context of the task and environmental demands while still maintaining the motor objective.
- **When to Adjust:**
  - *When engagement in an activity decreases* → increase task meaning or novelty for further motivation (ex.: prepare a meaningful meal, add social components, etc,)
  - *When quality of movement decreases* → decrease task complexity or environmental demand (ex.: pre-cut ingredients, decrease distractions, etc.))
  - *When compensatory patterns begin to dominate* → slow the task and reinforce proximal stability (ex.: support shoulder during reaching, reposition trunk, etc.)

Safety, energy conservation, and clinical judgment:

- The overall clinical objective is to provide sufficient challenges to promote change while still preventing injury, excessive fatigue, or maladaptive compensation during sessions.
- Monitor continuously for: decline in postural control, increase in tone with functional movement, reduced attention or sequencing, emotional frustration, and compensatory trunk movements to replace distal control
- Energy Conservation Considerations:
  - Teach pacing explicitly
  - Encourage strategic rest before fatigue peaks
  - Structure tasks in clusters
  - Consider cardiovascular tolerance in chronic condition populations

STRUCTURING INTERVENTIONS

Group vs. Individual Interventions Chart

	Individual Intervention	Group Intervention
Best for:	- early recovery stages - high physical assistance needs - significant cognitive or safety concerns - precise motor retraining	- increasing repetition volume - enhancing movement and accountability - facilitating social participation - promoting generalization of skills
Strengths:	- targeted facilitation - immediate correction of compensatory movement - tight control over task grading	- peer modeling - natural problem-solving - increased occupational authenticity
Limitations:	- lower repetition volume - reduced natural context - higher risk of therapist dependence - resource intensive	- reduced precision of motor facilitation - safety variability - uneven cognitive demands - less individualized grading
Clinician Reasoning Note:	If movement quality is your primary goal, individual sessions may be necessary	If endurance, participation, or psychosocial engagement is your focus, group formats can enhance outcomes for clients

Decision-Making Questions:

1. Does this client require continuous hands-on facilitation?
2. Would peer presence enhance or distract from occupational engagement?
3. Is the primary target motor refinement or participation volume?
4. Can safety be efficiently maintained in a group context?

ASSISTIVE TECHNOLOGY DECISION CYCLE



SECTION V:

OCCUPATION-BASED INTERVENTIONS AND SAMPLE GROUP PROTOCOLS

CHRONIC STROKE



The following charts are examples of individual interventions that can be implemented with stroke survivors to address each of the areas of occupation. Feel free to adapt the set up, materials, etc. to match your specific setting or client needs. Here is the overall protocol for a structured gardening group for those in the chronic phase post-stroke:

Group Title:	Embracing the Green Thumb: A gardening program for chronic stroke.
Demographics:	*Target Population:* Clients in the chronic phase over 6 months post-stroke.
	Intended Group Size: 4-6 participants
Focus of Intervention:	*Purpose*: The overall purpose of the group is to increase functional independence within this population through the engagement in meaningful tasks. The population being served through this program are clients in chronic phase post stroke (> six months) who are experiencing residual motor deficits. Although progress significantly slows after the six month mark, many clients still require continued interventions for functional independence past the typical continuum of care (Grefkes & Fink, 2020). When clients are presented with tasks that are more functional in nature, their retention of the skills required for their daily routines is more consistently maintained (Campos et al., 2019). This program will utilize this generalization to assist chronic stroke participants in improving their overall motor skills to more effectively participate in their daily lives.
	Review of Evidence: After thorough research, individuals over six months post-stroke are not receiving consistent and effective services due to insurance coverage impacted by slowed progress seen during the recovery process. The existing literature first demonstrated the need for the project through increased efficacy of the use of repetitive task practice even after the typical six-month timeframe. When adding a functional piece to the repetitive tasks, clients have a higher motivation level and tend to demonstrate increased functional independence (Page & Levine, 2021). Multiple studies have documented the importance of continued integration of services during activities of daily living (ADLs), mobility, and valued occupations in order for participants to strengthen these skills outside of interventions (Wassenius et al., 2020; Wurzinger et al., 2021). In addition, clients have experienced increased functional independence when provided with more opportunities for autonomy. After six months of recovery, impairments are still common post-stroke and participants may feel their participation in occupations is not balanced in their routine (Ahn et al., 2017). However, providing them with autonomy over their routines and recovery process could increase their volition and confidence to gain the functional independence necessary to participate. Finally, there is documented evidence of the use of gardening with the chronic stroke population. When incorporating movement that is purposeful and can produce a tactical result, such as a completed project or activity, it increases both the volition and the performance of the clients involved, as seen through a program run with clients averaging two years post-stroke (Lee et al., 2018). As the individuals in this project's groups begin the sessions, this project will be personalized to what will provide each participant with the most benefit in both physical and emotional factors influencing their engagement post-stroke.

Model:	The Canadian Model of Occupational Performance and Engagement (CMOP-E) is the most influential model for this program to run on. CMOP-E emphasizes the dynamic interaction between the person, their occupations, and the environment that influences engagement in their everyday occupations (Chagnon et al., 2023). This model encourages clients to participate in occupations that are meaningful, promoting motivation for individuals to consistently engage in routines (Chagnon et al., 2023). In this program, the foundations of this model will be applied to support participants' engagement in various gardening activities that promote purposeful opportunities to develop motor skills and strategies in a meaningful context. By utilizing CMOP-E, participants will be empowered to actively participate in diverse tasks that contribute to their occupational performance and quality of life overall.
Frame of Reference:	The Neurodevelopmental Technique (NDT) frame of reference will be used throughout the program to address motor impairments commonly experienced by individuals in the chronic phase post-stroke. NDT focuses on identifying and facilitating limited motor patterns through skilled handling at key points of control, enabling clients to improve motor control and functional movement with therapist assistance (Pathak et al., 2021). The use of progression logs is an integral component of NDT as it supports the generalization of carryover into meaningful activities throughout their routines (Marques et al., 2024). Participants in this program will engage in occupation-based gardening activities with guidance from the capstone student to promote motor improvement, bilateral integration, and safe participation in meaningful daily routines following a stroke..
Group Goals:	1. The program will provide opportunities for individuals to increase participation in meaningful leisure and ADL activities that support engagement in daily routines and long-term recovery.
	2. The program will contribute to participants' strategies for pacing, adapting, and sustaining engagement in health-promoting routines through gardening-related activities.
	3. The program will enhance social participation and emotional well-being through collaborative gardening activities and group-based problem-solving.
Outcome Criteria & Outcome Measures:	1. By the end of the program, at least 75% of participants will demonstrate an improvement of ≥ 2 points in performance and/or satisfaction scores on the COPM, reflecting increased engagement in meaningful occupations through gardening activities.
	2. At the end of the program, participants will demonstrate increased functional use of the affected upper extremity, as evidenced by therapist observation during gardening tasks and self-reported progress in weekly journaling entries.

Methods:	Each group will run for 1.5 hours with specific topics each week with a continuous goal to work towards developing a community garden. Specific papers will be distributed each week based on activity. Papers will be used to maintain knowledge of techniques learned during sessions and used as a knowledge check. The topics of each week are as follows: 1. Introduction to tools, resources and seeds 2. Occupation #1: Education 3. Occupation #2: Leisure 4. Occupation #3: Play 5. Occupation #4: IADLs 6. Occupation #5: Social Participation 7. Occupation #6: Sleep/Rest 8. Occupation #7: Health Management 9. Occupation #8: ADLs 10. Occupation #9: Work
Format of Group Sessions:	*Time:* 3:30-5:00pm, 10 weeks
	Place: Outdoor patio and indoor classroom
Supplies & Cost:	Art Supplies: • scissors, pencils, garden pots, paint/brushes, paper towels, wooden signs, markers, table cloths Classroom Supplies: • computer, projector, tables, rolling chairs, website with game, magnetic board, magnets, binders, paper, white board markers, white board Garden Supplies: • pictures of tools and herbs, plants, pruners, smocks, shovels, benches/kneeling cushions, potting soil, fertilizer, gloves, adaptive equipment, large mixing bowls Other Supplies: • Standardized assessments, outcome measures, snacks, drinks
References:	See Reference Page

Introductory Group Session #1

Title:	How to Bloom Your Skills: Group Overview	
Session Goals:	Participants will receive information on program structure and identify appropriate gardening items that they resonate with.	
Necessary Supplies:	computer, projector, tables, rolling chairs, pictures of tools, pictures of plants, bucket, worksheet, pencils	
Detailed Plan:	*Introduction:* 10 minutes	Participants will meet in the designated classroom and be asked to share their name and an interesting fact about them. Each participant will be asked to share, if comfortable, before moving onto activity.
	Activity #1: 20 minutes	A presentation of the outline of the group will be presented to the participants (See Appendix A). It will include the outline of the sessions, overall goals/outcomes, possible activities that could be completed, and the purpose of the outcome measures completed at baseline and at final evaluations.
	Activity #2: 25 minutes	Participants will sit in a circle facing each other with the group leader at the beginning. The group leader will take one packet of seeds/picture of a tool/quote related to gardening from a bucket then pass it around to each participant. Once they pick their item, they will be presented with a small worksheet (See Appendix B) that prompts questions such as: 1. What made you pick this item? 2. Is there a specific memory you associate with this item? 3. How do you feel about using this item after your stroke? 4. What would you like to do with this item in this group?
	Sharing: 15 minutes	Participants will be prompted to ask questions that may arise during the presentation. They will also be asked to share each answer to their question, one at a time, to increase group dynamics and create a safe space for sharing vulnerable information.
	Processing, Generalizing, Application: 10 minutes	Participants will contribute to an overall conversation regarding group participation and benefits that program can have on performance. The progression of skills required from the activity will be addressed and put into context of functional activities at home.
	Summarizing: 5 minutes	The group leader will summarize information presented to participants, their responses to the activities, and wrap up group.

Occupation: Education
Individual Session

Goal Focus	The client will sustain attention for at least one minute while learning one new planting method from the therapist.
Primary Therapeutic Targets	Cognitive endurance, sustained attention, note-taking strategies, sequencing, multi-tasking
Materials	Gardening guidebook, notebook, pencil
Set-Up	1. The client will be seated in a quiet learning space prior to outdoor implementation of the skill. 2. The client will receive a (visual/verbal/hands-on) demonstration of a new skill by the therapist. 3. The client will be able to take notes throughout the demonstration, then will write out steps to complete the skill on their own. 4. After the therapist confirms that the steps are appropriate, the client will be able to use these instructions to engage in the task themselves.
Grading Options	Downgrade: shorter video clip of instructions, partially filled-in steps written out Upgrade: multi-step written instructions to learn from
Adaptation Strategies	Highlight/bold key steps or sections, visual diagrams
Assistive Technology Options	Speech-to-text notes app, adapted pencil grasp
Safety Considerations	Avoid cognitive overload prior to physical task
Carryover Ideas	Apply newly learned technique during following planting sessions

Occupation: Education
Group Session #2

Title:	Roots of Wisdom	
Session Goals:	Participants will demonstrate knowledge of education through Jeopardy-type games in teams with other group members.	
Necessary Supplies:	computer, projector, white board, markers, website with Jeopardy game (See Appendix C)	
Detailed Plan:	*Introduction:* 10 minutes	Participants will meet in the designated classroom and be asked to share what their favorite plant, herb, vegetable, or fruit is as a warm up by passing around a bowl.
	Activity: 45 minutes (10 minute break halfway through)	Participants will be instructed to get into 2 groups for a Jeopardy game. Categories will include types of plants, benefits of herbs, planting techniques, bugs in the garden, and garden tools. Participants will answer at least one question each by raising up an object with their affected side.
	Sharing: 10 *minutes*	Participants will share one fact that they did not know before beginning the game and the difficulty of raising the object up to answer.
	Processing: 5 *minutes*	The group leader will ask participants for their experience while answering questions at the same time as raising their affected side.
	Generalizing/ Application: 5 *minutes*	Group members will be asked to find similarities between experiences when answering questions and learning together. Participants will discuss the situations that each topic could be used for.
	Summarizing: 5 *minutes*	Group leaders will summarize information learned and dismiss group members.

Occupation: Leisure
Individual Session

Goal Focus	The client will engage in a 20-minute flower planting activity with graded independence during functional reach, grasp, and mobility.
Primary Therapeutic Targets	Dynamic standing/sitting balance, UE reach, fine motor grasp, endurance, volition
Materials	Raised bed planter, soil, flower plants, lightweight trowel/shovel, gloves, watering can/hose
Set-Up	1. The client will stand at the raised garden bed with flowers set up on a nearby surface within a safe reach zone. 2. An option for seated gardening will be provided for rest breaks or for continued seated gardening. 3. The client will prep the soil by spreading it, planning where each plant will go, and digging a small hole in each spot. 4. The client will manipulate the flower plants to place into designated spots and fill in holes with dirt. 5. The client will identify when the task is done and initiate cleanup once confirmed.
Grading Options	Downgrade: Tabletop planting while seated, picture of flower set-up to match, labeled tools, split into multiple sessions Upgrade: Ground-level planting to facilitate weight shifting, place flowers in specific order by color/size/shape
Adaptation Strategies	Pacing schedule for endurance, long-handled tools
Assistive Technology Options	Ergonomic grip tools, gardening kneeling bench with handles, lightweight tools
Safety Considerations	Hydration, sun protection, balance, changes in positioning
Carryover Ideas	Daily watering and plant-check routine once planted

Occupation: Leisure
Group Session #3

Title:	Grow Through What You Go Through	
Session Goals:	Participants will complete two motivational crafts using bilateral integration with the assistance of the volunteers/group leader.	
Necessary Supplies:	terracotta pots, paint, brushes, paper towels, wooden signs, markers, pencils, adaptive equipment/list	
Detailed Plan:	*Introduction:* 15 *minutes*	Participants will meet in the designated classroom and be asked "What has been one source of motivation that has been helpful throughout your recovery". They will be asked to write it on a strip of paper that the group leader will assemble later.
	Activity: 50 *minutes*	Participants will be instructed to pick a terracotta pot or wooden sign to paint motivational phrases on. Adaptive equipment that is available for use will be presented and explained. Participants will receive assistance from group leader to efficiently hold utensils for writing/painting and adaptive equipment will be provided for those who need it. Participants will be encouraged to write as many motivational phrases and images on the signs and pots as they can using their affected hand to engage. If time allows, participants will switch and complete the other medium.
	Sharing: 5 *minutes*	Participants will be invited to share one phrase they used for motivation and meaning behind the phrase if comfortable.
	Processing: 5 *minutes*	The group leader will ask participants to reflect on: "How did it feel to use your affected side during this task?", "What helped you persist when it was difficult?", and "What role did other group members play in supporting you?".
	Generalizing: 5 *minutes*	Group members will be asked to connect experiences through the prompts: "What common motivational themes do we notice across our crafts?" and "How are these messages similar to strategies you've used in daily life?"
	Application: 5 *minutes*	Group members will be asked to share a task or occupation that they engage in where these fine-motor skills will be helpful that they had difficulty with in the past. The group leader will then present an assembled motivational chain from the introduction activity to connect to previous ideas.
	Summarizing: 5 *minutes*	The group leader will summarize the main themes that the participants produced during their discussion.

Occupation: Play
Individual Session

Goal Focus	The client will engage in a sensory-based herb planting activity by identifying at least one herb in the garden for each sense.
Primary Therapeutic Targets	Tactile tolerance, fine motor control, sensory input, attention, identification/matching
Materials	Herb plants, soil, organized chart for each sense (sight, sound, touch, smell, taste), pencil
Set-Up	1. The client will be presented with an herb garden with at least 5 different types of labelled plants present. 2. The client will be given time to analyze each plant. 3. The client will be provided with a piece of paper/worksheet to name at least one different plant for each of the senses. 4. The client will present each plant back to the therapist with which sense they associated the plant with.
Grading Options	Downgrade: Therapist-guided analysis of each plant and cues for texture, smell, etc. Upgrade: Client lists different senses and names other plants they can think of for each sense outside of what's in the garden.
Adaptation Strategies	High-contrast labels with large print
Assistive Technology Options	Magnifying glass, stabilizing mat for plants, adapted grip for pencil
Safety Considerations	Skin integrity, allergies, sensory overstimulation
Carryover Ideas	Client-created sensory garden plan based on preferred herbs and smells/textures

Occupation: Play
Group Session #4

Title:	Dig a Little Deeper	
Session Goals:	Participants will utilize their affected upper extremity to participate in play activities/games within the group.	
Necessary Supplies:	pots from previous group, table cloths, potting soil, fertilizer, gloves, adaptive gardening equipment, large bowls, scissors	
Detailed Plan:	*Introduction: 10 minutes*	Participants will meet in the designated classroom and complete a small activity of taking gloves on and off with the affected extremity as a brief warm up. If desired, a competition can be implemented for who does it the fastest, with an incentive to pick the first activity.
	Activity: 60 minutes	- Participants will be completing multiple group games related to gardening. **1**: Bag Opening (10 min)- Participants will walk other participants through the steps to use scissors or adaptive openers to cut open soil/fertilizer bags. **2**: Mixing (25 min)- In teams or pairs, participants will mix soil and fertilizer in large bowls using both hands. The group leader will encourage stirring, squeezing clumps, breaking apart the dirt to add the play element and bilateral integration. If interested, the group leader can add a mini game of who can make the "fluffiest soil" or "most even mix"? **3**: Scooping & Filling Pots (25 min)- Participants scoop measured amounts of dirt into their terracotta pots. They will be asked to alternate hands, stabilize with affected hands, or use adaptive scoops. The group leader can add "relay" style scooping (passing scoop from bowl to the pot using a different hand each round), then use spray bottles to moisten the soil. - Participants will fill at least 3-5 pots to prepare to put seeds into.
	Sharing: 5 minutes	Participants will share one strategy that they found helpful for each game within the activity.
	Processing & Generalizing: 10 minutes	The group leader will ask participants to share their experience using the affected extremity during the functional task: "How did it feel to use your affected arm during this?" and "What strategies did you notice from others that you would try in the future?".
	Application & Summary: 5 minutes	Group members will apply strategies discussed during previous steps to functional tasks within their ADL/IADL routines. The group leader will summarize the main points of the session & functional applications.

Occupation: IADLs
Individual Session

Goal Focus	The client will plan and prepare a simple salad using garden produce.
Primary Therapeutic Targets	Executive functioning, sitting/standing tolerance, UE functional use, sequencing, fine motor manipulation, grip strength
Materials	Meal plan sheet/blank paper, pencil, table, harvested vegetables, cutting board, adapted kitchen utensils
Set-Up	1. Client will be prompted to list the ingredients in their garden that would be appropriate to include in a salad. 2. Once the list is created and confirmed, the client can go out into the garden (or simulated garden/store) and gather plants. 3. The client will organize their work station with the tools and ingredients they will need to prepare the salad. 4. The client will wash and chop all ingredients to an appropriate level to integrate into the salad.
Grading Options	Downgrade: provide the list, pre-washed produce, set up environment Upgrade: time limits to create salad, decreased cueing, plan for certain number of people to feed
Adaptation Strategies	One handed cutting techniques, adaptive cutting board/knives, task segmentation
Assistive Technology Options	Rocker knife, one-hand cutting board, dycem, weighted tools, large-handle tools
Safety Considerations	Utensil safety (sharps), energy conservation, kitchen safety
Carryover Ideas	Weekly "garden-to-table" meal routine using different garden products

Occupation: IADLs
Group Session #5

Title:	Pick Your Worries Away	
Session Goals:	Participants will complete repetitive fine motor tasks to apply to IADL area of occupation with assistance from leaders.	
Necessary Supplies:	gloves, cushion, adaptive equipment, small plants, simulated garden activity	
Detailed Plan:	*Introduction: 5 minutes*	Participants will meet in the designated classroom and share an activity in their home, for their family, or within the community that they would like to improve their performance in.
	Activity: 60 minutes	**Outside:** Participants will travel together to the back patio and garden area as a group. They will use gloves, reachers, long-handled tools, and benches/kneeling cushions to help pick weeds in garden beds and in designated spots. (Competition can be implemented to see who fills one bag of weeds first). Participants will separate their plants picked into roots in one pile and leaves in another pile. They will then toss weeds into a "leaves" bucket or "roots" bucket utilizing both arms together. **Inside:** Participants will be provided with velcro boards and pictures of plants and garden items. They will utilize bilateral integration to hold the board while organizing the velcro items. Once each group organizes their board, they will work in pairs to disassemble thera-putty with beads and small objects hidden inside. Participants will organize their small items by color and place them into the appropriate containers using both arms.
	Sharing: 10 minutes	Participants will present each area and the amount of weeds that they picked, or their containers of beads.
	Processing & Generalizing: 10 minutes	The group leader will ask participants to share their experience using the affected extremity during the functional task: "How did it feel to use your affected arm during this?" and "What strategies did you notice from others that you would try in the future?".
	Application & Summarizing: 5 minutes	Group members will be asked to apply this activity to similar IADLs they engage/d in. The group leader will summarize the main points of the session and complete the clean-up with group members.

Occupation: Social Participation
Individual Session

Goal Focus	The client will initiate and sustain a conversation with at least two individuals about their experience during the group gardening session.
Primary Therapeutic Targets	Social confidence, communication, initiation, multi-tasking tolerance, divided attention
Materials	Structured discussion prompts, gardening materials
Set-Up	1. The client will attend a meeting of any local community garden group that is looking for volunteers. 2. The client will choose at least two different participants to initiate a conversation with. 3. The client will contribute to a productive conversation stating how they feel about the gardening tasks or how they feel they are doing in the group (or any other topics that are relevant)
Grading Options	Downgrade: one-to-one private conversation Upgrade: small group interaction
Adaptation Strategies	Conversation cue cards in pocket/nearby
Assistive Technology Options	Communication device/app if appropriate
Safety Considerations	Monitoring anxiety and overstimulation
Carryover Ideas	Weekly participation in community garden/meet-ups

Occupation: Social Participation
Group Session #6

Title:	Be-Leaf in Each Other	
Session Goals:	Participants will work in pairs when adjusting themed magnets on board to complete garden layout using affected extremity.	
Necessary Supplies:	partner, magnetic board, magnets with names of plants (See Appendix D)	
Detailed Plan:	*Introduction:* 5 *minutes*	Participants will be asked to choose a partner that they do not know well and ask what their favorite part of the program has been and one plant they would like to see in a garden. Each participant will share the information that their partner told them.
	Activity: 50 *minutes*	Motor Activity: Participants will be provided with a board and magnets with various names of plants, fruits, and vegetables on them. Partners will work together to plan a garden on a whiteboard using previous knowledge acquired in the program. Pairs will arrange their magnets into a garden layout on the board. Each partner must place magnets using their affected extremity. Groups will then swap boards and magnets and redesign a new garden with a different set. Social Support: Participants will watch a video from Ruth Rathblott about the "Power of Unhiding".
	Sharing: 20 *minutes*	Partners will be asked to share their garden with the entire group by placing magnets on the whiteboard for everyone to see. Participants will then be asked the following questions about the video they watched: "What part of Ruth's story stood out to you?" "Have you ever felt pressure to 'hide' parts of your stroke recovery?" "How does 'unhiding' connect with working together in this group?".
	Processing: 5 *minutes*	Participants will individually be asked how it felt to share their story while working with others. Participants will also be asked about the connection between hiding their post-stroke impairments and social participation.
	Generalizing: 5 *minutes*	Participants will be asked to determine how the concept of "unhiding" can affect their everyday occupations and routines.
	Application & Summarizing: 5 *minutes*	Group leaders will connect the impact of hiding current function on their independence. The group leader will summarize other main points of the session and complete the clean-up with group members.

Occupation: Rest & Sleep
Individual Session

Goal Focus	The client will independently implement structured rest breaks during a client-chosen activity to prevent post-activity fatigue.
Primary Therapeutic Targets	Energy conservation, self-awareness, pacing, self-monitoring
Materials	Client-chosen activity, activity log, timer
Set-Up	1. The client will engage in any preferred activity within the garden with therapist observation. 2. The client will verbally identify signs of fatigue as they appear to the therapist and be prompted to determine their needs. 3. The client will implement the needed rest break each time they begin to feel fatigued at appropriate intervals.
Grading Options	Downgrade: therapist-guided breaks if the client is not able to identify fatigue, structured guidance to choose less strenuous activity Upgrade: independent pacing without cues from therapist after first example
Adaptation Strategies	Pre-planned task segmentation
Assistive Technology Options	Wearable reminder device, activity-based adaptive equipment
Safety Considerations	Delayed fatigue, hydration, cognitive demands
Carryover Ideas	Apply pacing strategy to all outdoor tasks

Occupation: Rest & Sleep
Group Session #7

Title:	Restful Restoration	
Session Goals:	Participants will determine appropriate frequency of routine to maintain the garden using adaptive equipment.	
Necessary Supplies:	Magnetic pictures of tools (See Appendix E), whiteboard, marker	
Detailed Plan:	*Introduction:* 5 *minutes*	Participants will be asked to share one part of their morning/night routine that helps them wake up/wind down that they value. "Just like plants need regular care, so do our bodies"
	Activity: 60 *minutes*	The group leader will discuss the importance of sleep hygiene through consistent routine at night and in the morning with a small powerpoint (See Appendix F). Participants will then be presented with pictures of adaptive equipment on board used for both self-care and gardening. Purposes of tools will be presented in shuffled order. Participants will be asked to come up individually and draw lines on the whiteboard from picture to purpose. <u>Additional Activity:</u> Participants will work in groups to place steps (See Appendix G) of a self-care and a one-day garden maintenance routine in the appropriate order.
	Sharing: 5 *minutes*	Participants will be asked which part of the self-care or gardening routine they were not aware of and/or want to try in the future.
	Processing: 10 *minutes*	Participants will share their experience using their affected hand during the activities. The group leader will also ask participants what they noticed about how other members sequenced their routines.
	Generalizing: 5 *minutes*	Participants will be asked how the routines and tools seen today relate to their own routines at home.
	Application & Summarizing: 5 *minutes*	The group leader will emphasize the connection of consistently caring for our bodies like they consistently care for a garden.

Goal Focus	The client will independently manage their medication schedule using plant-watering routine as a cue to engage.
Primary Therapeutic Targets	Habit formation, executive function, routine building, memory
Materials	Pill organizer, medication (actual pills/tic tacs/beads), visual schedule/cue for medication, plant care schedule
Set-Up	1. The client will fill out their visual schedule of when each medication should be taken on laminated schedule & place in a clear spot near plants. 2. The client will put "medications" into the pill organizer in appropriate spots and confirm with OT. 3. The client will create a plant care schedule for each of the timeframes that their medications must be taken (ex.: pick off dead leaves in AM, water in afternoon, check soil in PM) 4. The client will integrate both taking medications and caring for plants into daily routine.
Grading Options	Downgrade: Once/day medication matching to plant-care Upgrade: Multiple timed medications, match plant stickers to certain medications that need care at certain times of the day
Adaptation Strategies	Visual checklist attached to watering can and pill organizer
Assistive Technology Options	Phone reminders synced with watering/medication times, large pill organizer, pre-packaged pill organizer from pharmacy
Safety Considerations	Possible missed/double doses, cognitive overload when pairing tasks
Carryover Ideas	Pair medication intake with daily plant care ritual

Occupation: Health Management
Group Session #8

Title:	Herb Your Enthusiasm!	
Session Goals:	Participants will demonstrate effective techniques of pruning herbs to use to increase health management.	
Necessary Supplies:	pictures of herbs, herb plants, pruners, gloves, table cloths	
Detailed Plan:	*Introduction:* 5 *minutes*	Participants will pick a card representing an herb out of a hat and share the herb they chose (if they have used it, smelled it/tasted it, or have used it in non-food related ways).
	Activity: 60 *minutes*	The group leader will present the benefits of popular herbs & how they are used. They will then demonstrate safe pruning techniques for herbs. Participants will rotate through the following activities for 15 minutes: 1. Real Pruning: Participants will be given an herb plant with instructions to prune a certain number of leaves/stalks. They will transfer these herbs into their appropriate basket once cut. 2. Sensory Herbs: Participants will be presented with a worksheet (See Appendix H) that has each herb listed. They will then be instructed to smell, feel, and taste (optional) the herbs and write what sensations come up. 3. Pipe Cleaner Pruning: Participants will be given pre-made pipe-cleaner plants that they can practice pruning skills on. 4. Herb-to-Health Match (See Appendix I): Participants will be given cards with herb names on it and cards with the previously discussed benefits on it and be instructed to match them independently. Participants will have an opportunity to write the meanings down in their binders.
	Sharing: 10 *minutes*	Participants will be asked to show the herbs that they pruned and one health benefit that they remember about their specific herb.
	Processing & Generalizing: 10 *minutes*	The group leader will ask questions such as "How did using your affected arm/hand feel during this?", "How is pruning like other tasks you do at home?", and "What differences did you notice between herbs (size, resistance, smell)?"
	Application & Summarizing: 5 *minutes*	Participants will be asked to choose if they would like to include herbs in the community garden that they will be forming and which ones.

Occupation: ADLs
Individual Session

Goal Focus	The client will independently remove gardening gloves to wash hands using affected UE as stabilizer on sink.
Primary Therapeutic Targets	Bilateral coordination, grip release, trunk control, weight bearing, sequencing
Materials	Gardening gloves, sink, soap, dirt (optional)
Set-Up	1. Client will pull up a w/c or sturdy chair up to sink for task start/end and during rest breaks 2. Client will doff gloves seated in the chair before standing at the sink. 3. Client will stand up at the sink with the affected side stabilized on the sink towards the faucet. 4. Client will complete hand hygiene routine at sink using faucet, soap, and hand towel
Grading Options	Downgrade: Remain seated at the sink, use a pump soap dispenser Upgrade: Use bar soap, manage long sleeves during glove removal
Adaptation Strategies	Backward chaining for glove removal, Visual cue card for steps
Assistive Technology Options	Lever-style faucet handle/extenders, automatic soap dispensers
Safety Considerations	Fall risk at sink, fatigue after preparatory activities, temperature sensitivities/sensory impairments
Carryover Ideas	Integrate hygiene routine immediately after gardening sessions

Occupation: ADLs
Group Session #9

Title:	Activities of Daily Gardening	
Session Goals:	Participants will utilize foundational gardening and bilateral integration skills learned in past sessions in a functional context to contribute to the community garden.	
Necessary Supplies:	outdoor garden beds, gloves, smocks, cushions, adaptive tools, dirt, magnetic board/magnets, buckets	
Detailed Plan:	*Introduction:* 10 minutes	Participants will meet in the designated classroom to prepare to go outside to work on the garden. Participants will be asked to identify an achievement that they are most proud of from the group so far. The group will then move outside to work on the beds.
	Activity: 60 minutes (10 min break)	Participants will work in designated areas of the community garden to prepare the beds for new plants. Participants will take turns in stationed activities while working in pairs/groups to prepare garden beds. 1. Each participant will take dirt out of bed while standing/supported and their partner will hold/support a bucket to put the old dirt in. 2. Participants will sit at the tables to mix fertilizer into the dirt in large bags/mixing bowls while their partner supports the bowl. 3. Participants will use adaptive tools to transfer dirt and mulch into the garden beds and pack it down slightly. 4. Participants will spread out plants on a magnetic board (scaled to garden beds) while seated at a table as a group to determine plants to use.
	Sharing: 5 minutes	Participants will share one task they completed well, and one task that they observed a group member doing well.
	Processing/ Generalizing/ Application: 10 minutes	Group leader will propose the following prompts: "What strategies did you use with your affected arm for each task?" "Which task felt the most like an activity you complete in your everyday routine?" "How can you apply these skills outside of the garden?"
	Summarizing: 5 minutes	Group leader will summarize main points of session and complete clean-up with group members

Occupation: Work
Individual Session

Goal Focus	The client will sustain engagement in a 30-minute simulated greenhouse task with appropriately spaced rest breaks as needed.
Primary Therapeutic Targets	Task endurance, postural control, fine motor coordination, executive functioning, sequencing, self-awareness
Materials	Seed trays, labeling materials, soil, watering can
Set-Up	1. The client will gather all materials for seed labelling & planting activity in the greenhouse. 2. The client will label all spaces in the seed tray with seeds that have been provided depending on the number of seed packets per tray. (2 seed packets = 2 trays, etc.) 3. The client will fill each tray with dirt and place the seeds in the appropriate labelled tray. 4. The client will water each individual slot to an appropriate level using a watering can.
Grading Options	Downgrade: seated labelling task & greenhouse work, pre-labelled trays, pre-filled trays Upgrade: provided with list of instructions as only cue, alternating standing and reaching tasks in greenhouse
Adaptation Strategies	Work-rest scheduling, task segmentation
Assistive Technology Options	Adaptive grip for tools, wheeled plant cart
Safety Considerations	Fatigue, orthostatic tolerance, heat
Carryover Ideas	Gradual shift to volunteer hours in local community garden/project

Occupation: Work
Group Session #10

Title:	Reap the Benefits	
Session Goals:	Participants will engage in higher level gardening tasks that mimic work tasks with bilateral motor integration, problem-solving, and social participation.	
Necessary Supplies:	outdoor garden beds, gloves, smocks, cushions, adaptive tools, plants, watering cans	
Detailed Plan:	*Introduction:* 5 *minutes*	Participants will meet in the designated classroom to prepare to go outside to work on the garden and be asked "What is one gardening skill you feel confident in now?"
	Activity: 60 *minutes*	Participants will work in designated areas of the community garden to plant the seedlings in stations: 1. Participants will work in 2 groups to match the previously assembled garden layouts to the plants in the garden beds. 2. Participants will each dig at least one hole for the plants while their group member places the fertilizer in the hole. Another participant will place the plant in the hole, and all will take turns covering and condensing the dirt. 3. Participants will assist their partner in using the watering can to hydrate each garden. One partner will fill the can inside the home health lab while the other supports the can. 4. Participants will form a line to take a picture with their accomplishments.
	Sharing: 10 *minutes*	Participants will share which part of gardening they felt most successful in during the session. They will then be asked to share their proudest moment from any of the previous sessions.
	Processing & Generalizing: 10 *minutes*	Group leaders will present the following prompts: "Which tasks have been the easiest/hardest for you during the program?" "What strategies have you utilized to complete the tasks?" "Which activities had the biggest impact on your motivation and confidence?"
	Application & Summarizing: 5 *minutes*	Participants will identify 2-3 gardening skills or strategies that they took from the program and will use in their daily lives. The group leader will utilize a powerpoint (See Appendix J) to summarize the areas of occupation, the social aspect of recovery, the CO-OP experience, and the group's achievements. Participants will be presented with a scrapbook of their time in the program at the end of the session.

The QR code below contains the handouts and appendices noted in the group protocols.



Additionally, see Appendix C for home exercise programs that contribute to these interventions



SECTION VI:

CASE-BASED CLINICAL REASONING SCENARIOS



CASE STUDY #1

JENNIFER (FRONTAL LOBE CVA)

Name: Jennifer A.	**DOB: 3/14/1983**	**ID: 938573**
Dx: CVA, 2-mo. post-stroke	PMH: Frontal Lobe CVA, High BP, Anxiety/Depression	
PLOF: independent in all ADLs/IADLs, managed finances independently, licensed driver, employed full time as a dental hygienist		
Reported Status: • Contact guard assistance for mobility due to impulsivity • Independent motor function and engagement in ADLs • Full score achieved on Mini-Mental State Examination (MMSE) (status evaluation assessment for setting) • Performed adequately on KELS (OT administered for further look into cognition) • Driver's license revoked • Family reports significant impulsive spending and phone-use with unsound decision-making present in both cases		

Clinical Interpretation:

- MMSE lacked sensitivity to executive dysfunction
- KELS measures functional knowledge and provides insight, but may not detect real-time impulsivity or judgement errors
- Frontal lobe lesions often present with: (Barrash et al., 2022)
  - Impaired inhibition, reduced self-monitoring, poor financial judgement, diminished risk appraisal

Documentation Justification Example:

- Client presents with preserved motor abilities WNL but demonstrates executive dysfunction secondary to frontal lobe CVA. Despite passing brief cognitive screenings, performance-based tasks reveal impulsive decision-making, reduced inhibitory control, and impaired financial judgement. Family reports significant change from prior independent financial management. Skilled OT is recommended to address executive functioning, safety awareness, and compensatory strategy development to reduce risk of financial harm and support safe community reintegration.

CASE STUDY #1

JENNIFER (FRONTAL LOBE CVA)

Key barriers to participation:

1. Executive Dysfunction
   a. Impaired planning and organization, reduced foresight, difficulty delaying gratification, inconsistent task completion
2. Impulse Control
   a. Online purchases without reason/budgeting, poor risk-benefit analysis, rapid decision-making without evaluation
3. Safety Awareness
   a. Difficulty identifying environmental hazards, underestimating risks, limited anticipatory problem solving
4. Role Disruption (psychosocial)
   a. Unable to drive, not currently working -> loss of professional identity as dental hygienist, difficulty processing that cognitive impairments limit her more than physical deficits post-stroke -> depression

"What Would You Do Next?" Clinical Prompts

1. Would you rely on MMSE results to justify discharge?
2. Which performance-based executive assessment would you administer next?
3. How would you assess financial decision-making capacity?
4. Would you recommend temporary financial oversight? Who is the best person on the interdisciplinary team to consult with for this?
5. How would you approach return-to-work for a client working in a healthcare role?

CASE STUDY #1

JENNIFER (FRONTAL LOBE CVA)

Intervention Pathway #1: Executive Function in Context

1. Goal: Improve real-time executive control during multi-step tasks
2. Example Intervention: Garden Planning & Budgeting Task
    a. Jennifer will be tasked with planning a small seasonal garden, researching plant costs, creating a supply list, staying within a $75 budget, and sequencing planting steps
3. Therapeutic Targets: inhibitory control, budget tracking, task sequencing, error detection, delayed gratification
4. Techniques: guided discovery, "Stop-Think-Plan-Do-Check", written prediction before task initiation, post-task reflective analysis
5. Clinical Rationale: gardening simulates financial planning, tool safety, sequencing, delayed outcome reward, & mirrors executive demands required for independent living

"Intervention Pathway #2: Financial Capacity & Risk Mitigation (Jones et al., 2025)

1. Assessment considerations: Financial capacity interview, real bill-pay simulation, online purchasing scenario analysis, impulse trigger identification
2. Compensatory Options: spending limits on debit/credit cards, dual-signature requirement for large purchases, automatic bill pay, budgeting app with alerts, family oversight/Power of Attorney temporarily
3. Clinical Reasoning: frontal injuries increase vulnerability to scams and impulsive spending. Early intervention reduces long-term financial harm.

Intervention Pathway #3: Return to Work Feasibility Analysis

1. As a dental hygienist, Jennifer previously required:
    a. Sustained attention, sequencing, infection control adherence, procedural consistency, professional judgement
2. Questions to explore:
    a. Can she follow multistep infection protocols without deviation?
    b. Can she manage appointment timing?
    c. Can she inhibit impulsive comments or actions?
    d. Can she recognize safety breaches?
3. Interventions:
    a. Simulated procedural sequencing tasks, timed multistep activity performance, dual-task scenarios, error awareness training

CASE STUDY #2

MARCUS (RIGHT HEMISPHERE CVA)

Name: Marcus P.	DOB: 7/27/1969	ID: 038673
Dx: CVA, 3 weeks. post-stroke	PMH: Right Hemisphere CVA → significant motor & perceptual impairment	
PLOF: independent in all ADLs/IADLs, drove independently, worked full-time in landscaping business, primary income earner for wife and two teenage children		
Reported Status: • Motor: left hemiplegia, limited proximal activation & absent distal movement, decreased postural control, moderate assistance for transfers • Sensory: decreased light touch and proprioception of LUE, impaired stereognosis, poor limb awareness, occasional unrecognized limb positioning • Perceptual/Cognitive: left neglect, decreased midline orientation, impaired visual scanning, impulsivity during mobility		

Clinical Interpretation:

- Client presents with significant motor, sensory, and perceptual impairments limiting ADL participation
- Left neglect significantly impacts: safety, environmental awareness, functional independence
- Flaccidity increases risk for: subluxation, learned nonuse
- Requires highly structured, multimodal intervention approach
- Good candidate for early repetition and positioning strategies

Documentation Justification Example:

- Client presents with left hemiplegia and left unilateral neglect following right CVA. He demonstrates limited movement in distal LUE, impaired proprioception, and decreased left visual attention impacting ADLs. The client would benefit from skilled OT neuro re-education, perceptual retraining, joint protection, and ADL remediation to prevent secondary complications and promote functional recovery.

CASE STUDY #2

MARCUS (RIGHT HEMISPHERE CVA)

Key barriers to participation:

1. Flaccid hemiplegia
   a. No active use of LUE, high risk of shoulder subluxation, learned non-use risk, limited bilateral integration
2. Left Unilateral Spatial Neglect
   a. Ignores left side of body and environment, collides with obstacles, leaves food on left side of plate, incomplete grooming
3. Sensory Loss
   a. Reduced proprioceptive feedback, poor limb positioning awareness, increased injury risk
4. Reduced Postural Control
   a. Lateral trunk lean, impaired sitting balance, decreased weight-bearing through affected side
5. Emotional & Role Disruption
   a. Loss of physically demanding occupation, threat to identity as provider, frustration and grief

"What Would You Do Next?" Clinical Prompts

1. Would you prioritize remediation or compensation first?
2. How aggressively would you pursue early activation of the flaccid limb? What does this look like?
3. Would you use constraint-induced movement therapy at this stage?
4. How would you address neglect during ADLs?
5. When do you introduce hemi-dressing techniques?
6. What positioning protocol will you implement to prevent shoulder subluxation/injury?
7. How do you educate the family to avoid learned non-use?

CASE STUDY #2

MARCUS (RIGHT HEMISPHERE CVA)

Intervention Pathway #1: Early Motor Recovery & Protection

1. Goals: prevent secondary complications, facilitate motor return, promote cortical reorganization, protect joint integrity
2. Interventions:
    a. *Positioning*: proper bed positioning, lap tray in w/c, shoulder protection education, avoid any pulling on affected arm
    b. *Activation Strategies*: Weight-bearing through LUE, assisted AAROM, scapular mobilization, mirror therapy, bilateral symmetrical tasks
    c. *Sensory Re-Education*: texture discrimination, proprioceptive input, tapping/vibration, joint compression
3. Clinical Rationale: Early flaccidity is high risk for subluxation and neglect-driven nonuse. Protect the joint first, activate the muscles after.

Intervention Pathway #2: Neglect Remediation

1. Core Strategies:
    a. Visual scanning training: anchoring strategies, lighthouse scanning technique, reading tasks requiring initiation to the left
    b. Environmental manipulation: place objects on left intentionally, approach from left during therapy, cue leftward trunk rotation
    c. Left-side activation: weight-shifting onto left side, reaching across midline to left, bilateral gardening tasks requiring left stabilization
2. Clinical Rationale: Neglect improves with repetitive, task-specific, attention-driven interventions. Passive compensation alone is not as effective when implemented this early.

Intervention Pathway #3: ADL Re-Training

1. Dressing: hemi-dressing technique, seated positioning for safety, visual scanning checklist before completion, initial use of adaptive clothing
2. Grooming: mirror feedback, structured left-to-right checklist, tactical cueing for neglected side
3. Bathing: shower bench, handheld showerhead, long-handled sponge, verbal sequencing cues



SECTION VII:

PROFESSIONAL DEVELOPMENT AND CLINICAL CONFIDENCE FOR EMERGING PRACTITIONERS



DOCUMENTATION OF OCCUPATION-BASED OUTCOMES

When documenting intervention sessions, ensure that notes clearly connect *client performance to meaningful occupations rather than isolated impairments.*

Key Components:

- Functional Activity
  - What occupation was addressed? (ex.: meal preparation, gardening, dressing, medication management, etc.)
- Performance Barriers
  - Motor limitations
  - Cognitive Barriers
  - Psychosocial factors
  - Environmental challenges
- Skilled Intervention Provided
  - Cueing
  - Task grading
  - Environmental modification
  - Facilitation of movement
  - Education
- Measurable Functional Change
  - Increased functional independence during task
  - Reduced assistance required compared to previous sessions
  - Improved safety awareness during functional activity
  - Improved task sequencing for multi-step activity

Example Documentation:

The client completed a raised-bed gardening task requiring bilateral UE use to transplant seedlings. The client required moderate verbal cues for sequencing and safety awareness due to executive functioning deficits. The task was adapted by using lightweight tools and remaining in a seated position for the duration of the session. Client demonstrated improved sustained attention and completed the task with decreased impulsive movements compared to the previous sessions.

WRITING DEFENSIBLE JUSTIFICATIONS

Insurance and interdisciplinary teams often require therapists to justify why OT services are medically necessary.

Defensible OT documentation should answer the following three questions:

1. Why does this impairment limit occupational performance?
    - Example: Decreased grip strength limiting ability to hold gardening tools
2. Why is OT uniquely qualified to address this problem?
    - Example: OT integrates motor recovery interventions with meaningful activity to ensure that clients feel that their recovery needs are addressed.
3. What functional outcome will improve?
    - Example: Independent participation in gardening and home management tasks to engage in the preferred activities in their daily routines.

Example Statement:

Skilled OT is required to address impaired motor coordination and executive functioning that is currently limiting the client's ability to safely complete meal preparation and household tasks. Intervention focuses on task-specific training, cognitive strategy development, and environmental modification to promote safe and independent participation in daily occupations.

COMMUNICATING VALUE TO INTER-DISCIPLINARY TEAMS

Scenario	How to Communicate OT Value
Team Rounds	Emphasize participation outcomes during sessions
Physician discussions	Connect therapy to discharge planning and independence
Nursing Collaboration	Provide positioning, transfer, and safety strategies
Family meetings	Explain how therapy supports meaningful daily activities

OT Phrases	Skilled OT Explanation	Why the change:
"We worked on strengthening today."	"The client engaged in task-specific upper extremity strengthening during meal preparation activity to improve ability to safely lift cookware and perform kitchen tasks."	- links strengthening to functional performance & meaningful activity - strengthening should almost always be connected to supported occupations
"We did ROM exercises"	"Guided active-assisted range of motion was incorporated into grooming tasks to promote shoulder mobility required for hair care and dressing."	- demonstrates integration of therapeutic exercises into functional activity - explain how the movement improves participation, not just the movement
"We worked on cognitive exercises"	"The client completed a structured medication management task requiring sequencing, attention, and error detection to address executive functioning deficits impacting medication adherence."	- specifies which cognitive skills were addressed and their functional relevance - name the exact cognitive process (attention, sequencing, problem solving)
"We worked on balance"	"Dynamic standing balance was addressed during simulated laundry tasks to improve safety and stability when reaching outside the base of support during household management tasks."	- demonstrates task specific training and real world relevance - tie balance work to functional movement demands
"We worked on fine motor skills"	"Client practiced grasp and release using gardening tools to improve hand-dexterity required for manipulation of everyday household objects."	- explains why dexterity matters functionally for the client
"We practiced dressing"	"Client completed upper body dressing training using adaptive strategies to compensate for decreased shoulder range of motion and improve independence with daily self-care"	- shows that the problem leads to the intervention which then leads to functional goals
"We talked about safety"	"Environmental safety awareness was addressed during a simulated kitchen task to improve the client's ability to identify fall hazards and safely manage meal prep tasks."	- demonstrates context-specific safety training
"I educated the patient"	"Provided client and caregiver education on energy conservation strategies to support safe completion of daily tasks while managing post-stroke fatigue."	- identifies content of education and functional purpose of session

SECTION VIII:

LONG-TERM RECOVERY- CLIENT & CAREGIVER EDUCATION

1. **Understanding Recovery Timelines**
2. **Nerve Regeneration & Neuroplasticity**
3. **Family Dynamics & Expectation Management**
4. **Risk Reduction & Secondary Stroke Prevention**
5. **Social & Emotional Adjustment After Stroke**
6. **Home Safety Checklist**
7. **Fatigue Management Strategies**
8. **Caregiver Support Tips**
9. **Transferring & Mobility**
10. **Red Flags to Address in Stroke Recovery**



***DISCLAIMER

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Understanding the Stroke Recovery Timeline

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1. STROKE EVENT/ONSET

Key focus: Stabilization, medical management, safety, prevention of recurrence.
Why this matters: Early awareness of impairments → guide OT & family expectations.
OT Implication: screening of motor, cognitive, perceptual, & functional abilities

2. ACUTE PHASE (DAYS 1-7)

Primary Focus: monitor vitals/neurological status, prevent complications, early movement
Therapy Goals: positioning/basic movements, range of motion (ROM), early participation in self-care tasks/activities of daily living (ADLs)

3. EARLY SUBACUTE PHASE (1 WEEK-3 MONTHS)

Primary Focus: Intensive rehabilitation and regaining basic functional skills
Therapy Goals: practicing ADLs, improving mobility/balance, addressing cognitive/perceptual changes, introducing assistive tech, family involvement

4. LATE SUBACUTE PHASE (4-6 MONTHS)

Primary Focus: Increasing independence & participation in meaningful activities
Therapy Goals: improving endurance/coordination, practicing complex ADLs, re-entry into community when possible, strength/balance training

5. CHRONIC PHASE (6+ MONTHS)

Primary Focus: long-term functional independence, adaptation, & quality of life
Therapy Goals: maintainng strength & mobility, managing fatigue, adapting tasks → independence, returning to daily occupations

Grefkes, C., & Fink, G. R. (2020). Recovery from stroke: current concepts and future perspectives. Neurological research and practice, 2, 17. https://doi.org/10.1186/s42466-020-00060-6

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HOW THE BRAIN RELEARNS

AFTER A STROKE

Neuroplasticity & Recovery

- The brain has the ability to reorganize and form new connections through a process called **neuroplasticity**.
- The brain can relearn skills & develop new pathways with practice, repetition, & meaningful activities.

The Brain Can Relearn Skills



Neuroplasticity allows undamaged parts of the brain to help take over functions that were affected by the stroke.



What this means:

- Recovery is possible even after brain injury
- Skills may improve with practice over time
- The brain adapts when its challenged

Use It to Improve It

When affected skills are practiced regularly, the brain is more likely to maintain & strengthen those connections

Helpful Strategies:

- Use affected side during daily tasks
- Engage in meaningful hobbies & routines at home



Practice Strengthens Brain Connections

Repeated practice of a task helps strengthen the brain pathways needed to perform that activity.

Examples: practicing dressing tasks, using the affected arm during daily activities, repeating functional movements during therapy

The more meaningful and repetitive an activity is, the stronger it becomes





Recovery Takes Time

- Brain recovery does not happen overnight.
- Improvements often occur gradually and may continue for months or years after a stroke.



Meaningful Activities

The brain learns best when activities are personally meaningful and functional.

Examples include:

- Cooking or preparing meals
- Gardening or hobbies
- Personal care tasks
- Household routines

Therapy Guides Recovery

Rehabilitation professionals help design activities that challenge the brain while maintaining safety.

Occupational therapists may:

- Adapt tasks to support success
- Introduce assistive devices when needed
- Progress activities as skills improve

https://www.nuvancehealth.org/health-tips-and-news/how-neuroplasticity-helps-the-brain-recover-from-a-stroke

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Supporting Independence After Stroke:

A guide for families and caregivers

Recovery after a stroke often changes family roles and routines. It can be dfficult to know when to help and when to step back. Supporting independence while providing apprirpiate asisstane can help build confidence, improve recovery, and reduce frustration for both the survivor and their family

Encouraging Safe Independence

- Allow stroke survivor to attempt tasks they can do safely
- Practicing everyday activities helps rebuild strength, problem-solving skills, & confidence
- Helpful strategies:
  - allow extra time for tasks
  - offer verbal cues before physical assistance
  - celebrate small improvements and progress



Avoid "overhelping"

- family members often want to help as much as possible, however this can limit recovery progress
- Instead of doing the task for them:
  - Ask: "What part would you like help with?"
  - Provide guidance instead of taking over
  - Encourage them to try first

Set realistic expectations

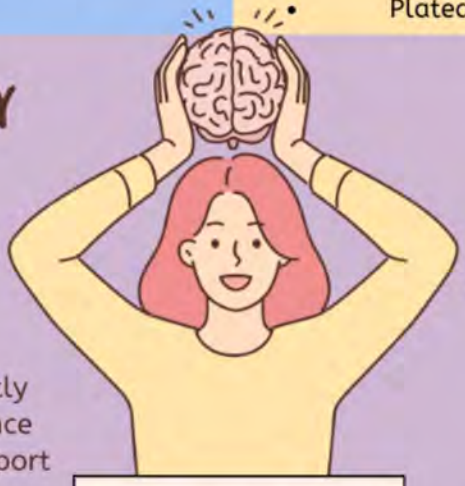
- Stroke recovery can gradually take months or years
- Some abilities may improve significantly, while others may require long-term adaptation

Helpful reminders:

- Recovery timelines vary for every person
- Progress may come in small steps
- Plateaus are a normal part of recovery

Communicate openly about needs

- Changes in independence → frustration, tension, or misunderstandings
- Consider discussing:
  - **What** tasks to try independently
  - **When** they would like assistance
  - **How** family members can support without taking over
- Clear communication can help prevent conflict and support collaboration during recovery.



Cejalvo, E., Martí-Vilar, M., Merino-Soto, C., & Aguirre-Morales, M. T. (2021). Caregiving Role and Psychosocial and Individual Factors: A Systematic Review. Healthcare, 9(12), 1690. https://doi.org/10.3390/healthcare9121690

Take care of the caregiver

- Support can be physically and emotionally demanding
- Caregivers who take care of their own health and well-being are better able to provide support over time.

Caregiver tips:

- Ask for help from other family members or friends
- Take breaks when possible
- Seek caregiver support groups or community resources.

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https://www.ahajournals.org/doi/epub/10.1161/STR.0000000000000375

Reducing the Risk of Recurrent Stroke:

Pople who have had a stroke are at higher rsk for others to occur afterwards. Healthy habits can reduce this risk.



Take medications as prescribed | These help control blood pressure, prevent clots, and manage cholesterol



Monitor blood pressure | High blood pressure is one of the most common risk factors for stroke. Frequent checks allow you to keep track.



Healthy eating |

- Eat a balanced diet with fruits, vegetables, whole grains, & lean proteins
- Limit salt, saturated fats, & processed foods



Managing Diabetes & other chronic condiitons | High blood sugar & high cholesterol can damage blood vessels over time.



Know the signs |

<u>Use the acronym BE-FAST:</u>

Balance: loss of balance
Eyes: loss of vision in one/both eye(s)
Face: noticeable droop on one side
Arm: one side hanging lower/immobile
Speech: slurred/confused speech
Time: callng 911 ASAP helps limit brain damage

https://www.va.gov/sheridan-health-care/stories/every-second-counts-learn-befast-to-spot-stroke-symptoms/

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Social & Emotional Adjustments Post-Stroke

Recovery after a stroke affects more than physical abilities. Many suriviors exprience emotional, social, and identity changes as they adjust to new roles & routines.

Changes in Mood

common: frustration, sadness, anxiety

- Encourage open conversations about emotions
- Validate feelings without dismissing them
- Seek professional support if changes persist





Change in Identity

feeling like part of identity is "lost"

- Focus on meaningful acticvities the person enjoys
- Adapt hobbies instead of abandoning them
- Celebrate progress & new accomplishments

Social Isolation

fatgue & reduced confidence

- start with short, low-pressure social interactions
- Stroke support groups/community programs





Building Confidence Again

confidence grows with participation

- acknowledge small improvements
- encourage independence when safe
- Focus on abilities rather than limitations

https://strokeonward.org/guide/

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IMPORTANT

Home Safety Checklist

The home environment plays an important role in recovery and daily independence. This checklist provides some practical tips to reduce risks and make everyday activities easier. Use these suggestions as a starting point when creating a safe home environment.

Entryways

- ○ Clear walkways of clutter
- ○ Ensure good lighting
- ○ Install handrails if needed
- ○ Remove loose rugs or secure with non-slip backing

Living Areas

- ○ Keep commonly used items in reach
- ○ Arrange furniture for wide paths
- ○ Use stable chairs with arm rests
- ○ Ensure electrical cords are cleared from walkways

Bedroom Safety

- ○ Keep a lamp within reach
- ○ Ensure clear walking paths to door
- ○ Keep assistive devices nearby (walker, cane, wheelchair, etc.)

Bathroom Safety

- ○ Install grab bars near toilet/shower
- ○ Use non-slip mats in shower/tub
- ○ Consider a shower chair/tub bench
- ○ Use a raised toilet seat if standing is difficult

Kitchen Safety

- ○ Keep frequently used items in reach to avoid excess bending
- ○ Use non-slip mats/cutting boards
- ○ Turn pot handles inward
- ○ Keep sharp objects safely stored/organized

General Safety Tips

- ○ Wear supportive, non-slip footwear
- ○ Use assistive devices recommended by therapists
- ○ Take time when standing or changing positions

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https://www.stroke.org/en/life-after-stroke/recovery/home-modifications

https://www.stroke.org/en/about-stroke/effects-of-stroke/physical-effects/fatigue

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Managing Fatigue After Stroke

Fatigue is one of the most common symptoms after stroke. It may occur even after small activities.

Signs of Post-Stroke Fatigue

- feeling tired even after rest
- difficulty concentrating
- increased frustration or irritability
- reduced physical endurance

Strategies to Manage Fatigue:

1 Pace your activities

- break tasks into smaller steps
- take rest breaks before exhaustion

2 Prioritize Important Tasks

- focus energy on activities that matter most
- spread tasks throughout the day

3 Plan Rest Periods

- schedule short rest breaks during the day
- avoid waiting until you are overly tired

4 Create a Daily Routine

- consistent sleep and activity schedules can help regulate energy levels

5 Listen to Your Body

- recovery requires energy
- rest is an important part of healing!

Discuss fatigue concerns with your healthcare team!

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CAREGIVER ROLES & RISKS FOR BURNOUT



WHY IS THERE A LACK OF SERVICES?

AARP has identified that family caregivers can spend up to 20 hours/week for around 6 months providing care, and 18% of them are doing it without any form of payment

ROLE OF THE CAREGIVER

Caregivers provide in-home services, as well as community and medical outings, to an individual or family member. This can include formal trainings from an organization or informal education from another practitioner.





SETTING BOUNDARIES

Many caregivers have a hard time setting boundaries with loved ones that they care for due to the expected need of family support. It is difficult to take space when they are living in the same environment.

BUILDING RESILIENCE

By prioritizing dimensions of wellness, like self-care and conflict resolution, caregivers can build the skills to overcome barriers and protect their well-being



Tonekaboni, F.Q., Pashaeypoor, S., Haghani, S. et al. (2025). The effect of resilience education on family caregivers' strain of older people with chronic diseases: a randomized clinical trial. BMC. https://doi.org/10.1186/s12912-025-03083-z

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Safe Transfers & Bed Mobility After Stroke



Bed Mobility

Rolling & Repositioning
Safe vs. Unsafe Strategies

- ✓ Encourage person to use their stronger side to assist movement
- ✓ Bend knees and roll shoulders and hips together
- ✓ Support the affected arm and leg during movement
- ✓ Use pillows to maintain alignment and comfort
- ✗ Letting the arm get trapped under the body or twisting the body suddenly

Transfers

Bed <-> Chair

- Position feet flat on the floor before standing
- Place stronger foot slightly behind the affected foot/leg
- Encourage person to push up from bed/chair

Sit to Stand

- Scoot to the edge of bed/chair
- Place feet flat, shoulder-width apart
- Lean forward ("nose over toes")
- Assist at their hips or trunk, not at arms

Rolling

1. Bend both knees (if applicable)
2. Guide shoulders and hips to roll together
3. Support affected arm across the body
4. Place pillows behind back or between legs for support

Positioning

- Hips all the way back in the chair
- Feet supported on footrests or floor
- Affected arm supported on pillow/ structure
- Upright posture (no leaning)

Video Examples

Rolling

Bed-Chair

Sit-Stand

Positioning

Warning Signs

- Sudden pain (especially in shoulder)
- Loss of balance or dizziness
- Increased weakness or confusion
- Skin redness or breakdown
- Excessive anxiety/worry

Tips for Caregivers

- Take your time. Slow = Safe!
- Give simple, one-step directions
- Allow the person to do as much as they can (use strong side, pivot, etc.)
- Ask your OT for personalized strategies

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RED FLAGS

DURING THE STROKE RECOVERY PROCESS

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These visuals are intended to support quick clinical decision-making and education across settings.

Wheelchair Positioning



- hips back in chair
- feet supported
- arm supported

- sliding forward
- arm hanging
- leaning to one side



Shoulder Subluxation



- arm supported
- safe handling
- positioning

- visible gap in joint
- limited movement
- arm hanging



Fall Risk



- proper supervision
- no tripping hazards
- energy conservation

- impulsivity
- imbalance
- cluttered space

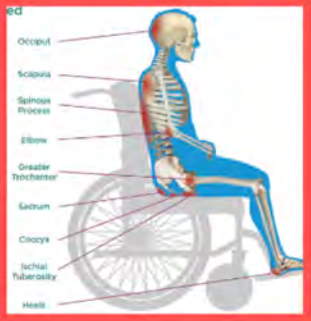


Skin Breakdown



- even pressure distribution
- repositioned every 2 hours in bed/chair

- high risk pressure areas: sacrum, heels, elbows, shoulders



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APPENDIX A

Resting Hand Splint

In stroke recovery, a resting hand orthosis can be integral in preventing joint contractures, maintaining joint alignment, reducing pain, and providing prolonged low-load stretches (Coppard & Lohman, 2008).

Indications

1. Flaccid wrist/hand post-CVA, emerging flexor tone, poor positioning in bed/wheelchair, high risk of contracture, hand resting in persistent flexion, pain with unsupported wrist
2. CAUTION: severe edema (address first), skin breakdown, open wounds, poor tolerance to positioning, severe spasticity requiring dynamic approach

Target Positioning (Functional Resting Position)

Wrist: 20-30° extension
MCPs: 45-70° flexion
PIPs/DIPs: slight flexion
Thumb: palmar abduction + slight flexion

Materials Needed

- ☐ Low temperature thermoplastic
- ☐ Stockinette, padding
- ☐ Velcro straps (2-3 minimum)
- ☐ Scissors
- ☐ Heat pan
- ☐ Marker
- ☐ Towel

APPENDIX A

Fabrication Steps:

(Coppard & Lohman, 2008)

1. <u>Create the pattern based on client anatomy</u>
   a. Place hand palm-down on paper w/ neutral positioning
      i. Draw an outline of the arm from fingertips to elbow
   b. Markings for trough:
      i. **A** on radial styloid
      ii. **B** on ulnar styloid
      iii. **C** on CMC joint of thumb
      iv. **D** on apex of th thumb webspace
      v. **E** on webspace between 2nd & 3rd digits
      vi. **F** on olecranon process of the elbow
      vii. **G** Draw horizontal line across forearm ⅔ way down
         1. Extend line out 1 ½" from forearm
      viii. **H** 1" out from radial styloid on **A**
      ix. **I** 1" out from ulnar styloid on **B**
      x. **J-** Draw a *dotted* vertical line from **E** down 3 inches to palm & another *dotted* line from **D** toward ulnar side of hand until lines intersect
         1. **N** Make mark at 1" laterally from **D** on thumb
      xi. Draw a line from **J** towards the wrist & curve around **C** mark & draw upwards until it reaches space between **N** & **D**
      xii. **K** 1" to the radial side of index PIP joint
      xiii. **L** 1" from top of middle finger
      xiv. Draw a line <u>around top</u> of fingers from **N** to **L** to **M**
         1. Extend the line down through **I** and down to **G**, across the forearm, up to **H**, and connect to **C**

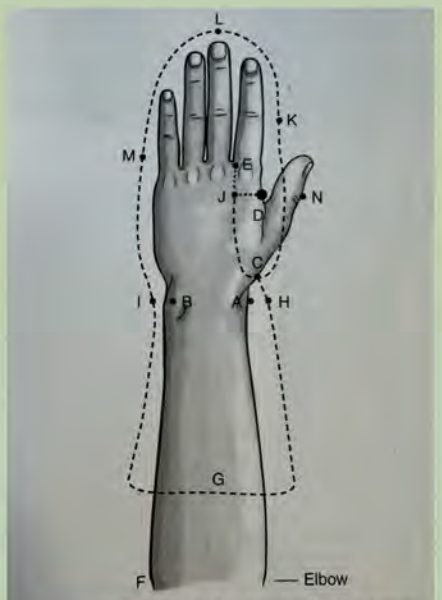


Figure 9-12 A detailed resting hand splint pattern.

2. <u>Cut out the **solid** lines on paper & transfer onto splinting material</u>

- **Heating & Molding**: Heat thermoplastic, apply stockinette, position wrist into target extension, mold material around forearm and palm, maintain thumb and web space; readjust as needed
- **Edge Finishing**: Trim sharp edges, flare proximal and distal borders, check pressure at: ulnar styloid, radial styloid, thenar eminence, thumb web space
- **Straps**: across top of PIP joints, proximal to MCP joints, proximal to thumb IP joint, top of wrist, proximal forearm trough

APPENDIX A

Resting Hand Splint

Monitoring & Reassessment

- Reassess weekly in acute/subacute settings, with tone changes, if any redness/pain is reported, if ROM changes
- Watch for: increasing flexor tone, pressure areas, skin breakdown, client discomfort, edema changes

Clinical Reasoning Considerations

(Coppard & Lohman, 2008)

- Flaccid stage: primary goals are protection & positioning, preventing subluxation, and maintaining soft tissue length
- Emerging tone: primary goals are to inhibit flexor synergy, provide prolonged stretch, and prevent contractures
- High spasticity: consider anti-spasticity splint designs, dynamic splinting, or serial casting (if appropriate)

Education for Client/Family

- Teach all parties: purpose of the splint, how to don/doff, daily skin checks, what level of redness is concerning, splinting does not equal permanent dependence

Documentation Example

- Fabricated custom resting hand orthosis to maintain wrist in 25° extension, MCPs 60° flexion, thumb in palmar abduction. Orthosis is indicated due to flaccid LUE and risk of flexion contracture. Client and caregiver educated on wear schedule and skin checks. No pressure areas noted at the end of the fabrication session.

APPENDIX B

Trunk Control Assessment & Intervention

- Foundation for balance, posture, and UE function
- Impacts ADLs, transfers, and safety
- Deficits → poor midline, decreased reaching, compensations

Assessments	Interventions
Posture / Midline • Upright sitting • Lateral lean / pushing **Stability** • Sitting with/without UE support • Tolerance for unsupported sitting **Weight Shifting** • Lateral and forward reach • Control vs loss of balance **Movement Quality** • Trunk activation during tasks • Compensations (leaning, momentum) **Endurance** • Fatigue over time	**Supported Sitting** • Tabletop tasks • Reaching with support • Bilateral UE use **Dynamic Sitting** • Reach outside base of support • Functional tasks (laundry, meal prep) **Postural Training** • Verbal/tactile cues • Mirror feedback **Progression** • Supported → unsupported • Increase reach distance • Add cognitive dual task • Progress to standing
Integration into Occupations	**Clinical Tips**

• Grooming- sink level or standing
• Dressing- setting up routine
• Meal prep- energy conservation
• Leisure- gardening, crafts, etc.
	• Watch for compensations
	  ◦ Prioritize safety
	  ◦ Grade for success
	  ◦ Consider fatigue







APPENDIX C

Home Exercise Programs

Table of Contents:

1. Program 1: Reaching & Tabletop Control
2. Program 2: Hand Opening & Object Use
3. Program 3: Daily Task Practice
4. Program 4: Coordination & Fine Motor Control



APPENDIX C

Program 1: Reaching & Tabletop Control

Functional goal: Improve ability to reach and stabilize objects during tabletop activities.

Sets: _____

Repetitions: _____





Activation

Trunk Stretch

- Place hemiplegic arm on stable, elevated surface with shoulder flexed while seated
- Slightly shift weight forward onto surface to stretch torso muscles

Arm Lifts

- Lay flat on back with hands clasped together
- Lift arms together to pain tolerance

Movement Control

Extending the elbow

- Place elbow on table on top of towel
- Extend forearm down to table to pain tolerance



Turning the forearm

- Clasp hands together with fingers interlocked
- Alternate placing one hand on top & swap

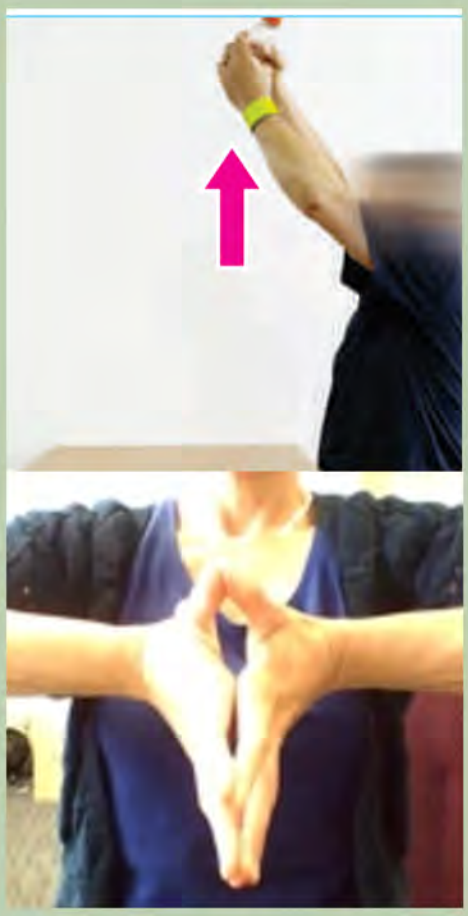


APPENDIX C

Program 1: Reaching & Tabletop Control

Sets: _____

Repetitions: _____



Strengthening

Lifting an object

- Place two hands clasped around object
- Lift upwards to pain tolerance

Opening the hand

- Place fingertips of both hands together
- Press together to open hand & hold

Functional Practice

Drawing a line

- Stabilize ruler on paper with hemiplegic hand
- Draw lines with other hand



Moving a bottle

- Place box centered to body
- Move bottle up & over box back & forth



Holding a cup

- Hold cup w/ hemiplegic hand
- Turn on faucet & maintain grasp on cup



APPENDIX C

Program 2: Hand Opening & Object Use

Functional goal: Improve grasp, release, and object manipulation.

Sets: _____

Repetitions: _____



Activation

Shoulder Abduction

- Grasp outer arms with both hands
- Shift arms outwards & lift shoulder

Elbow Flex

- Place towel on inner elbow
- Bring arm upwards towards shoulder & stretch

Movement Control (Extension)

Wrist

- Hold hemiplegic hand by fingers
- Lift hand up to pain tolerance

Finger

- Place hand flat on table
- Lift fingers upwards & hold

Thumb

- Stabilize thumb on hemiplegic hand
- Lift upwards & stretch web space







APPENDIX C

Program 2: Hand Opening & Object Use

Sets: _____

Repetitions: _____





Strengthening

Lifting the Wrist

- Place hand at edge of surface with wrist off the surfac
- Lift hand upwards to pain tolerance

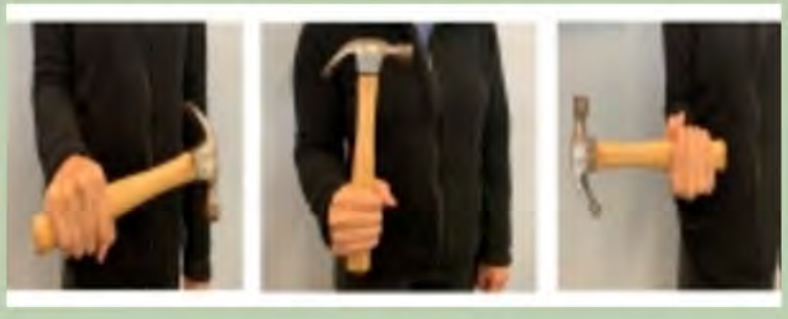
Extending the Elbow

- Bring hand up to shoulder with elbow bent
- Extend arm outwards & attempt to straighten arm; hold

Functional Practice

Turning an Object

- Hold object upwards
- Turn wrist to face downwards
- Bring back to center, then turn wrist upwards



Opening a Bottle

- Hold bottle with hemiplegic hand to stabilize
- Open water bottle with other hand



APPENDIX C

Program 3: Daily Task Practice

Functional goal: Support independence in self-care and daily routines.

Sets: _____

Repetitions: _____



Activation

Lifting the Arms

- Clasp two hands with arms straight
- Lift upwards to pain tolerance

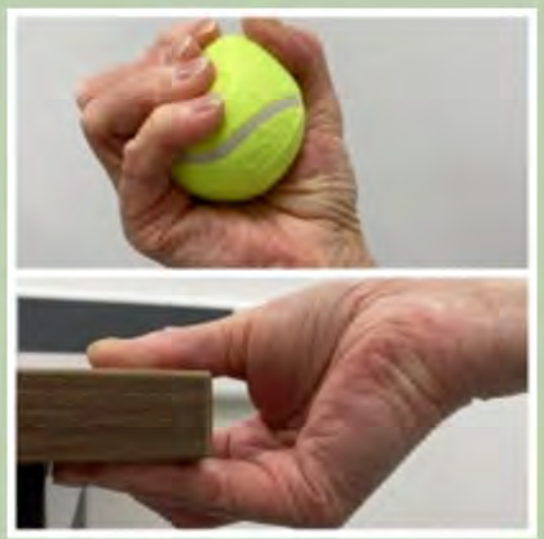
Wrist Mobilization

- Hold hands in fists with wrists in neutral
- Circle wrists outwards then circle inwards

Strengthening

Hand Grasping

- Hold object in hemiplegic hand
- Squeeze object to pain tolerance



Lifting an Object

- Place box centered to body
- Move bottle up with one hand over box and grab with other hand



APPENDIX C

Program 3: Daily Task Practice

Sets: _____

Repetitions: _____



Functional Practice

Hair brushing

- Place brush in hemiplegic hand and support with other hand
- Bring arm up to head and brush hair to typical style



Turning on a tap

- Hold cup under tap with the unaffected hand
- Turn on faucet with hemiplegic hand and let water run
- Turn off water when cup is full

Using A Spoon

- Place spoon in hemiplegic hand
- Support with unaffected hand and bring up to mouth
- Place food on spoon as upgrade



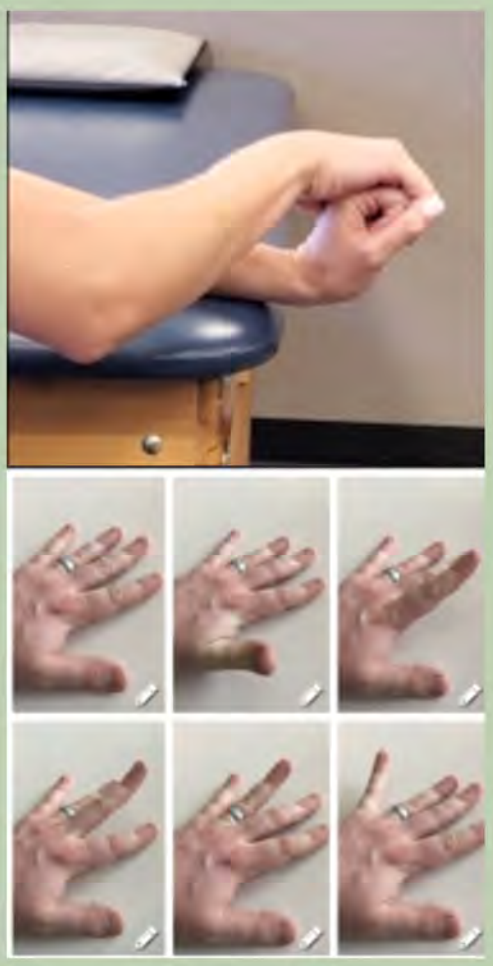
APPENDIX C

Program 4: Coordination & Fine Motor Control

Functional goal: Improve fine motor coordination and social/leisure participation.

Sets: _____

Repetitions: _____



Activation

Extending the Wrist

- Place hemiplegic hand at edge of surface with wrist off the surface & support with other hand
- Lift hand upwards to pain tolerance

Extending the Fingers

- Place hand flat on table
- Lift fingers upwards one at a time & hold

Strengthening

Finger Pinch

- Place pin in hemiplegic hand
- Pinch index finger and thumb to open pin



Finger Extension

- Place rubber band around all fingers
- Extend fingers outwards to pain tolerance



APPENDIX C

Program 4: Coordination & Fine Motor Control

Sets: _____

Repetitions: _____

Functional Practice

Writing

- Pick up the pen with the hemiplegic hand
- Write out the alphabet, name, address, etc.
- Stabilize with unaffected hand



Turning pages

- Place the magazine/book on the table and stabilize with _____ hand
- Flip through all pages with _____ hand



Throwing a ball

- Place medium size ball in both hands
- Throw ball up to wall & catch
- (can also lift ball up to wall and bring back down)

