NeuroRally Spin Stroke Recovery Protocol

Relearning movement and practising cognition through table tennis

At NeuroRally Spin, we use table tennis to create meaningful opportunities to practise movement and thinking after stroke. A moving ball gives each participant a reason to look, prepare, reach and respond. Each attempt provides feedback and another opportunity to learn.

We adapt the experience to the movements available to the participant. Practice may begin with guiding a ball across the table toward a target and develop into controlled racket returns or shared rallies. Our aim is to support useful movement, coordination and confidence while keeping learning engaging and personal.

Relearning through repeated experience

After stroke, the brain can adapt through experience and practice, a capacity called neuroplasticity. Purposeful repetition is central to our approach. We give a movement a clear goal, repeat it and help the participant learn from what happens. This draws on established stroke-recovery principles of meaningful, repeated, task-specific practice. [1,2]

For example, directing a ball toward a target involves noticing its position, preparing the arm, making contact and judging the result. Repeating that cycle creates opportunities to refine the action. We return to familiar activities across sessions, then introduce a small change so the participant continues learning.

Why this matters after stroke

A stroke can affect arm and hand movement, sensation, body awareness, balance, vision, attention or communication in different combinations. We select **table tennis** activities that practise the abilities each person wants to develop. A small purposeful reach, a more controlled contact or noticing a target can be a meaningful step. Where active movement is available, we include the affected part in achievable ball and racket tasks. Activities may use one hand or each hand in turn, depending on ability. The ball provides a clear reason to start a movement and a visible result to learn from. Seated and wheelchair-based play can also offer purposeful practice.

We combine movement with manageable thinking challenges, such as recognising a colour, remembering a target sequence or choosing where to return the ball. The participant practises acting on information while moving, with enough time and repetition to understand the task.

What we practise through table tennis

These examples connect adapted table tennis activities to movement and cognitive skills. We choose activities that match the participant's current abilities and learning goals.

Training focus	General exercise example	What the activity practises
Visual tracking and scanning	Follow a rolled or fed ball and locate a clear target.	Following movement and directing attention toward relevant space.
Reaching and arm use	Guide a ball or make a controlled return using available arm movement.	Purposeful reaching, movement initiation and active arm control.
Hand and eye coordination	Bring the racket to the ball and direct it toward the table.	Linking what is seen with hand position, timing and direction.
Reaction and anticipation	Respond to a predictable feed, then a choice of ball positions.	Noticing the ball's path, preparing and beginning a response.
Coordination of both sides	Use each hand in turn for simple ball tasks when active movement allows.	Coordinating each side and including the affected arm in practice.
Body awareness and balance	Reach from a seated or standing position and return to a starting point.	Awareness of body position, trunk control and weight transfer.
Target practice	Aim toward a marked area and adjust the next attempt.	Accuracy, force control and learning from immediate feedback.
Attention and focus	Stay with one rally goal and refocus on the next ball.	Sustaining attention and selecting information relevant to the task.
Colour recognition and choice	Match a colour cue to a target for the next return.	Using visual cues, remembering a rule and making a choice.
Inhibition	Return for one cue and pause the response for another.	Holding a rule in mind and withholding an automatic action.
Memory and sequencing	Remember a short order of targets or ball-control actions.	Recalling instructions and putting movements in sequence.
Dual tasking	Return a ball while counting or responding to a simple colour rule.	Sharing attention between movement and a thinking task.
Flexible thinking	Change the target when the coach changes the rule.	Updating a plan and adapting the next response.

Helping each person learn after stroke

We adapt how we teach as well as how we play. A participant may need help with language, remembering a sequence, noticing a target or preparing a movement. We use their strengths to make the activity easier to understand and practise.

When speaking or understanding language is difficult. We demonstrate, use short phrases and allow time to respond. Pointing, gestures, pictures and actions can communicate a choice. Difficulty speaking does not by itself show how much a person understands or can learn.

When attention or visual awareness is challenging. We use a clear layout, contrasting targets and one visible goal. We guide attention toward the ball or target and repeat a familiar pattern before adding more choices.

When memory or sequencing is difficult. We break the task into small steps, use consistent cues and revisit the same short sequence. Reminders can be reduced as the participant remembers more independently.

When more time is needed. We slow the feed and leave time to notice, prepare and act. A table-top ball task can create a clear starting point before a moving-ball rally.

When the participant is ready for more. We change one feature, such as target position, direction or a thinking rule. The familiar activity remains recognisable while the new feature creates another learning opportunity.

Connecting practice with useful function

Reaching toward a ball, controlling its direction and preparing the next response practise abilities involved in everyday actions. Remembering a rule while moving also gives a purpose to attention and memory practice.

Rebuilding confidence through participation

Making a deliberate contact, finding a target or sharing a longer rally gives the participant something concrete to recognise and build on. Playing with a coach or partner offers connection and enjoyment. We use these experiences to encourage active participation and repeated opportunities to learn.

Our approach applies established stroke-recovery principles to adapted table tennis.

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