



Written Q&A Boxing Webinar
by Josefa Domingos & John Dean

How does boxing help a person with Parkinson's? What differences can we expect?

Boxing is a promising and popular intervention for Parkinson's. In addition to the published evidence on the safety, feasibility, and effectiveness of boxing to improve balance, mobility, and endurance, participants in these studies consistently report a very high level of enjoyment.

Additionally, boxing might also improve cognition through aerobic and cognitively demanding components such as memorizing the boxing combinations. Given the importance of these cognitive processes in maintaining balance and reducing falls, community programs such as boxing may help manage these problems in Parkinson's.

Notably, the only randomized controlled trial (RCT) by Combs et al. (2013) showed boxing to be potentially more effective than conventional group exercise in improving gait, speed, and endurance. However, the conventional group (physiotherapy with a particular focus on obstacle training) showed better results for improving balance than the boxing group.

How often should sessions be attended to be beneficial? How many hours do we have to put in a week to see the benefits?

Boxing is an excellent way to combine many of the exercise domains that are recommended by the Parkinson's Foundation exercise guidelines:

- Aerobic (three days/week for at least 30 min per session, with continuous or intermittently moderate to vigorous intensity),
- Strength (two to three non-consecutive days/week, 30 min per session of 10-15 reps for major muscle groups, resistance, speed, or power focus),
- Agility/dual task (two to three days/week)
- Flexibility (two to three days/week)

Ideally, any exercise routine for Parkinson's should be ongoing to maintain results. An optimal program could last a minimum of eight weeks, two to three times per week, for a minimum of one hour to reap benefits.

What does the research say about Boxing or Rock Steady Boxing (RSB) and the amount and experiences needed to make a difference in Parkinson's progression? How does it compare to other exercises?

There are currently four peer-reviewed published studies on boxing and Parkinson's and five ongoing unpublished registered studies.

The published studies included two studies led by Combs et al. (2011) and (2013). The first was a case-series study including six males with a mean age of 60.2 years and a mean disease duration of 28.7 months. Later in 2013, this same group published a randomized controlled trial with a slightly older and more advanced cohort that included 21 males and ten females with a mean age of 67.2 years and a mean disease duration of 45.7 months. Both studies showed key benefits overbalance, gait speed, walking endurance, mobility, and quality of life.

Another study has just been completed but not yet published by this group at the University of Indianapolis, comparing the effects of a non-traditional boxing training program to a traditional therapeutic exercise program on activity and participation outcomes in persons with Parkinson's.

The third published study is an implementation study that we did to evaluate the acceptability and safety of a Parkinson's-specific boxing program in Stockholm. We developed specific educational resources with videos and an outline with practical recommendations to facilitate the boxing instructors.

The fourth paper is a review of current publications titled "Boxing for Parkinson's Disease: Has Implementation Accelerated Beyond Current Evidence?", written by a group of physiotherapists highlighting some of the key concerns that we raised in the webinar (unfortunately, our article was in press as theirs was being released, so it didn't make it into the review). That article is also available through an open-access journal, "Frontiers in Neurology," and would also be a good one to check out for another perspective.

The ongoing studies, as well as those already completed, are looking into a variety of data, such as:

1. The impact of a boxing training program on people with Parkinson's.
2. Evaluating the respective effect of Rock Steady Boxing (RSB) as compared to outcomes for PD SAFEx on Parkinson's.
3. The effectiveness of a Turning Boot Camp rehabilitation intervention (that involves practicing turning while dual-tasking).
4. Flexibility, anticipatory weight shifting, Tai Chi, boxing, and agility) improves the quality of turning in participants with Parkinson's.
5. The change in patients diagnosed with Parkinson's before, during, and after a 12-week RSB boxing exercise program.
6. Compare cardiorespiratory fitness (CRF) and gait endurance in people participating in boxing programs.

Have there been any studies on virtual reality boxing games and their impact on Parkinson's?

Virtual reality technology is increasingly seen as a new rehabilitation tool that potentially improves motor learning and functional activities by replicating real-life scenarios in a motivating and engaging interactive environment. Commercial VR systems, such as Nintendo, Wii, or Xbox Kinect are frequently used for boxing games and training by people with Parkinson's. In fact, the Wii has a commercially available boxing "game" that has been available for many years, although there haven't been any studies about it for Parkinson's. Early pilot studies have explored the effectiveness of VR interventions in Parkinson's and have suggested positive effects on gait, balance, and cognitive function after training. Notably, these are very early studies with small groups of participants and uncontrolled research designs. We are unaware of specific efficacy studies of boxing and VR in Parkinson's. A recent study compared the effects of virtual versus in-person boxing training in people with stroke. Interestingly, the results showed that there was no superiority for either approach. Stroke Rehabil, 2021 Mar;28(2):112-126.doi: 10.1080/10749357.2020.1783918. Epub 2020 Jun 23

What can be done to make it even more interesting?

A Parkinson's-specific boxing class should include specific movements focused on speed, amplitude, and functional activities because they are more beneficial for addressing Parkinson's.

Some strategies to make these approaches more engaging could include paired activities. For example, two people could spar without contact with one in "fighting mode" while the other is "slipping and ducking." If there are any concerns about accidental contact, increase the distance between the two boxers.

We also had success developing activities that can be done with the whole group (beyond the warm-ups and the cooldowns) and have one of the key results from our study. We identified that the activities with the highest level of satisfaction were the group segments.

This can include cueing (visual, auditory, and tactile) to achieve the amplitude desired. For example, putting tape on the floor to reinforce where feet are to be placed to maintain a wide base of support.

Specific to measuring progress: We have used pre-and post-session Timed up and Go (TUG) testing as a way of motivating and showing gains.

One essential element is the use of music that is motivating and engaging. That becomes harder in the Internet age as anything that appears online will be subject to copyright claims. Still, we have had some success with programs that we do online and are only available during the actual session with no recordings made available later. As a certified Zumba instructor, Josefa also has access to specific recordings that an organization made available during Covid for online classes.

My husband tried RSB for two classes and didn't like it, but it was over six yrs. ago. Now that his symptoms are so much worse, it may be time to try it again. How do I motivate him to start it?

We recommend contacting the gym and asking for an assessment and additional support when he comes back to try again. If he enjoys the session, make sure that the instructors know that they have to "meet him" where he is now in terms of capacities so he can have success and regain that motivation to return.

Those dealing with more significant issues related to Parkinson's may realize less benefit, but it can still be very beneficial for ongoing motivation.

Depending on the specific reasons why individuals engage in the activity, they might want something more or less specific.

For example, when dealing with someone with less motivation and issues with apathy, you might consider doing anything motivational, as in that case, anything is always better than nothing.

For someone else, perhaps looking to address improving walking, turning specifically, and initiation, it would be beneficial to find a professional to focus on exercises for those specific movements.

What happens if you can't get to a class either because there isn't one near you or because you are locked down through Covid? Is there a good way of doing it online at home?

In our experience, online classes are quite helpful for maintaining fitness, and many of our people report that the exercise intensity is comparable to an in-person class. The only complaint we ever get is that it's challenging to interact with others in the group. However, we endeavor to have time in every class expressly set aside for those types of interactions.

There are several online exercise programs for Parkinson's, so we encourage you to check out some of the current offerings available to see what works best for your needs. Here are a couple that we are involved in: Keep on Moving and the Exercisecast. Both are available (for free) through the EPDA.

Punching bags: Now, with the pandemic through Zoom, what happens if you do not have punching bags? To supplement times at RSB, I purchased a speed bag and 100 lb. weighted bag for home use. Is that suggested?

Punching pillows or sofas could be an alternative. However, just doing the punching moves is potentially equally beneficial, if somewhat less motivating.

Purchasing equipment (e.g., a speed bag) could be an alternative, but I would recommend a softer punching bag that you feel moves (you receive more tactile information) and doesn't hurt your hands.

If you are going to be hitting a solid object like a heavy bag, we strongly recommend using boxing gloves to maximize safety. Hitting a pillow or some other soft object is not an issue, but

we recommend against improvising with other solid objects because of the potential for injury or discomfort.

Do people always wear gloves? Do you need to have your own gloves or other equipment? How will boxing work online without gloves etc.?

In a typical boxing session, it is common to use boxing gloves, either provided by the club or that people bring. There are, however, techniques like shadow boxing or Boxercise where you don't use gloves and mimic the punch with a "shadowboxing" approach. Even though this isn't as "cool," it is still a good way to get this type of exercise.

Is there a fix for one or more toes pushing down all the time? What is dystonia?

Toes pushing downward refers to the experience of involuntary muscle spasms or contractions that may lead to twisting or jerking movements and unusual body positions (called dystonia). Dystonia can affect almost any part of the body, but usually, only one area is affected. Among others, hands and feet are commonly affected. When the hand is involved, it often occurs with specific activities, such as writing or playing a musical instrument. When a foot is involved, it often occurs in the morning (low or "OFF" periods) or can occur with balance-specific activities.

Treatments for dystonia are limited. We recommend discussing your options with your specialists. The doctor will try to identify a cause and will recommend a specific treatment for that cause. Some types may resolve with better levels and timing of your regular Parkinson's medication. Some other medications could be considered (in consultation with a neurologist that knows your specific medical situation). These include anticholinergics, benzodiazepines, Baclofen, and muscle relaxants) that may provide some relief, but the benefits these approaches may provide have to be balanced with potential side effects. Another standard option for dystonia is botulinum toxin injections that temporarily weaken muscles to relieve the contractions/spasms. These are administered by medical experts three to four times per year. In certain situations, there may also be surgical treatment options.

info about dystonia and Parkinson's: <https://davisphinneyfoundation.org/dystonia-and-parkinsons>

What if you have back conditions/surgery and poor balance?

It is recommended that people should always be assessed carefully before integrating any form of exercise, more so with boxing, particularly if other medical issues are present. Recent surgery would be a contra-indication, while poor balance depends on the amount of support available within the class. We have empirical knowledge that poor balance can increase back pain during boxing sessions as additional effort must be placed on keeping safe (increasing rigidity) and doing upper body activities (particularly in conjunction with cognitive load) challenges balance even more, potentially increasing back pain. In the end, your safe participation depends on the knowledge of the instructors to guide you to do the activities without harm.

Additionally, several situations might be significant barriers to participation, so let your instructor know if you are currently coping with:

- Significant sudden motor fluctuations (uncontrolled violent dyskinesia; severe ON-OFF)
- Onset of active psychiatric problems (ex: confusion, psychosis, aggression)
- Uncontrolled orthostatic hypotension
- Parkinson's-specific problems that might arise in a group such as impulsivity and risky behaviors as well as severe changes in posture during the exercises
- Freezing of gait episodes also significantly increase the risk for falls. This is not associated with the exercises per se but perhaps more the busy environments in the gym and negotiating all the attention needed to participate
- Hesitations in movement when making a quick decision as they can also increase the risk of falls

How many people per coach would be beneficial?

A group size of six to eight people at comparable levels of physical function is recommended per therapist/instructor to ensure positive group dynamics and safety. However, additional helpers/volunteers/cornermen/care partners may further enhance safety and allow for bigger groups. Importantly, however, smaller group sizes allow for more personalized approaches.

Where are the gyms in the Denver area?

In Colorado specifically, the "homegrown" program is called Power Punch for Parkinson's, and specific information would be available on the Parkinson Association of the Rockies website.

More generally, you might refer to the Rock Steady Boxing website to see if they have any affiliates in the region.

Who would we contact about trying to bring Rock Steady Boxing to our area? PT, Neurologist?

It would probably be a good idea to reach out to current healthcare professionals who are providing services to Parkinson's (including physical therapy and occupational therapy and perhaps even speech therapy) to see if they are already providing these services (or are interested in starting a program).

Again, specific to Rock Steady Boxing, you can visit their website to see if they have affiliates in the region. However, we are quick to point out that there are other training options for boxing, including Boxercise and the nonprofit BoxingforParkinson's.org mentioned during the webinar. It's also possible to build your own program optimally in collaboration with the physical therapist or other healthcare provider.

In the end, the first step is to reach out to clinicians in your area who are already working in Parkinson's and see what may already be available and gauge their interest.

Can these classes ever get covered by insurance when there aren't free classes?

Speaking specifically to the US, insurance typically covers "skilled services" by licensed clinicians, and those services are dependent on showing ongoing progress to be maintained on the caseload. There are some exceptions, including "maintenance therapy," but that may not be applicable in this situation.

So, the short answer to your question is that these classes are typically not covered by insurance. However, some Medicare Advantage plans and other insurers will have coverage for "Silver Sneakers" if there happens to be an instructor teaching boxing, but that is not a guarantee.

Having said that, there are several free classes available online, so it might be valuable to do a search. The caveat is that these types of programs are not likely to be tailored to your specific needs. Furthermore, you should carefully select programs led by professionals with appropriate expertise in Parkinson's.

Given the limitations boxing has shown with balance outcomes, combining boxing and trampoline training can potentially be better. Trampolines can be used for training safely while challenging your balance too. There are many recreational businesses with trampolines for fun.

Is that what you are using?

We are studying a supervised trampoline program that challenges balance and drives motor-cognitive processes in similar ways as in real life. We have integrated boxing into that, but our approach is not the primary focus of that pending research. As you surmised, the use of trampoline training, where individuals can safely practice weight shifting, respond to unexpected slips/ trips, and train-controlled falls, better simulate such real-life situations. We use the space of a recreational business during hours where they have fewer people. Even though trampoline training hasn't been studied in people with Parkinson's yet, it's feasibility and efficiency at improving balance, dynamic gait, and fall self-efficacy has been studied in several other populations, such as elderly individuals with intellectual disabilities and those who are recovering from a stroke.