

Why Dance for Parkinson's Disease

Olie Westheimer, MA

Brooklyn Parkinson Group (BPG) in collaboration with Mark Morris Dance Group (MMDG), a renowned modern dance company, developed dance classes for persons with Parkinson's disease (PD), friends, and family. In 5 years, classes have increased from 2 to 9 participants once a month, to weekly classes of 20 to over 30 participants. Professional dancers teach the classes in a large dance studio with live piano accompaniment. This article explains the rationale of dance for PD, describes teaching methods, and includes participants' observations. Perceived benefits noted by 15 participants with PD to a validated questionnaire are discussed. **Key words:** *dance, exercise, imagery, music, quality of life, Parkinson's disease, socialization*

BROOKLYN PARKINSON GROUP (BPG), a chapter of National Parkinson Foundation (NPF), provides outreach services in affiliation with the Clinical Center of Excel-

From the Brooklyn Parkinson Group, a chapter of National Parkinson Foundation, and Clinical Center of Excellence for Parkinson's Disease and Related Disorders, Kings County Hospital/SUNY Downstate Medical Center, Brooklyn, NY.

The author thanks the National Parkinson Foundation for its support of the Brooklyn Parkinson Group dance program and other outreach activities, and the NPF Clinical Center of Excellence for support, hands on help and advice. She and all dance class participants are grateful to the Mark Morris Dance Group for its financial support of the Dance for PD classes.

"Dance for PD" classes are an evolving, collaborative effort. "Dance for PD" classes are taught by Mark Morris Dance Group company members John Heginbotham and David Leventhal, dancer, and Mark Morris Dance Group School faculty member Misty Owens, and pianist William Wade. They work with Brooklyn Parkinson Group and class participants to refine, enrich, and expand our Dance for PD repertoire. The classes owe their existence to the encouragement of my husband, Ivan Bodis-Wollner, and to the interest of Nancy Umanoff, Mark Morris Dance Group Executive Director, who was willing to take a chance and support them. Eva Nichols, MMDG Education Director, works with Brooklyn Parkinson Group to expand the "Dance for PD" Program, and makes sure the classes happen every week.

Corresponding author: Olie Westheimer, MA, Clinical Center of Excellence for Parkinson's Disease and Related Disorders, Kings County Hospital/SUNY Downstate Medical Center, Brooklyn, NY 11201 (e-mail: westheimer@sprynet.com).

lence for Parkinson's Disease and Related Disorders, Kings County Hospital/SUNY Downstate Medical Center, Brooklyn, NY. The first outreach service offered was a monthly support group meeting, which attracted 5 to 10 attendees, persons with Parkinson's disease (PD) and caregivers. Some were newly diagnosed, and others affected for 10 years and more. Meetings combined discussion with talks by invited speakers on topics such as tips for clear speech, nonmotor deficits, and confusion in PD. A personal review of what had been learned after 1 year coalesced into 2 strong impressions. (1) At meetings, many persons with PD and caregivers exhibited, but did not talk about in a direct manner, the frustration, anger, and sadness that the diagnosis of PD had created for both of them. Only 1 person with PD talked openly about being depressed. (2) The content of the daily lives of persons with PD seemed to revolve mainly around PD, with many doctors' appointments, PD support group meetings (many attended several support groups), much time spent reading about PD, and for some, appointments with a variety of therapists. Likewise, many spouses' and partners' lives seemed to have become mainly defined by being a caregiver. The conclusion drawn was that the support group attendees needed to do something enjoyable, *together*—just plain fun, unrelated to PD. The rationale section explains why dance for PD was chosen.

RATIONALE FOR DANCE FOR PD

1. Persons with PD, caregivers, and friends could participate in dance classes individually, each at his or her own level, while at the same time, be part of a group. Dancing with others in a class is a highly social activity.
2. Dance classes would provide exercise, integral to health for persons of all ages and advocated for persons with PD. Dance movement sequences stretch and strengthen muscles, increase flexibility in neck, shoulder, trunk, limb, fingers, hands, toes, and feet, and contribute to aerobic stamina. The way dance is taught promotes heightened awareness of where all parts of the body are in space at all times. How to maintain balance is a fundamental skill developed in dance. The benefits of exercise, however, are subsidiary aims of a dance class. The primary goal is aesthetics—specifically, moving with grace—just for the sake of beauty, and also, often, for expressing feelings and telling stories through movement. Dancing would take mind and spirit away from thoughts of disease and disability. Dance classes, therefore, would improve the mood of persons with PD and caregivers.
3. It is well known that visual cues¹ and musical rhythms² often help persons with PD who no longer can rely on their unconscious sense of balance and ability to initiate and control automatic movements such as walking. What well-trained dancers know how to do very, very well, is control their movements with cognitive strategies and conscious use of all sensory input. It was assumed that persons with Parkinson's disease as well as others in the class would benefit from and enjoy learning techniques dancers use to stand, sit, and move with grace.

PARTICIPANTS

All persons with PD are welcome to join the class and to bring a family member, friend, or caregiver. In the first year the once a month class size ranged from 2 to 9 persons. A few times only 1 person showed up. In the past 2 years the now weekly classes have grown from 18 to 32 persons. The class consists of persons with PD who come on their own, others who come with spouse, relative or friend, and attendants. The classes always have more persons with PD than others. Age range of those with PD is 50 to 90 years, with more men than women. Disability from PD ranges from persons recently diagnosed, to persons who use a walker or cane or are in a wheelchair; exhibit tremor, freezing, retropulsion, kyphosis, tire easily, complain of memory problems, have difficulty getting out of a chair and walking backward. Three persons who come to classes have had deep brain stimulation (DBS). On the Hoehn and Yahr scale,³ symptoms exhibited would fall into stages 1, 2, 3, and 4.

AMBIENCE AND TEACHING METHODS OF DANCE FOR PD

Location

The 1-hour 15-minute weekly classes are held in a large dance studio with wooden floor, a ballet barre along 3 walls and floor to ceiling mirrors on one wall. A piano is in one corner. Next to the studio is a lounge with a few large tables, chairs, and sofas where participants can leave their belongings, relax, and talk before class begins. The entire building is wheelchair accessible and bathrooms are just across the hall from the dance studio and lounge.

Personal contact and conversation

There is time before class for greetings and small talk. The dance leaders say hello to participants whom they have seen in previous classes. A representative of BPG acts as host, greeting people and introducing new

participants. In class, participants are addressed by name. Discussion is a part of the dance classes.

The 3-part format of a traditional ballet class—at the barre, in the center, moving across the floor—is adapted

1. Warm-up, during which basic movements for the whole body, weight shifting, and balance are practiced at the barre with one hand touching for proprioceptive feedback, is done instead with participants seated and also, for some sequences, holding the back of their chair.
2. Practice of these same kinds of movements in the center of the room with no tactile feedback is done instead at the barre with one or both hands touching.
3. Memorized, choreographed sequences performed across the floor while the teacher observes, are done instead with the teacher leading.

Live musical accompaniment

Just as in a traditional dance class or on stage, the tempo and style of music played affects the quality of movement dancers use, continually informing them of how and when and in what way they should move. “Pachelbel’s Canon,” for instance, elicits flowing adagio movements. It is often used in the beginning of class while everyone is seated, to accompany some variation of a sequence for upper body warm-up in which arms, back, trunk and neck bend and curve, slowly in all 4 directions—dance variations of the yoga sun salutation. Another favorite piece is “Hernando’s Hideaway” from the musical “Pyjama Game.” The well-known lyrics of the song support the dramatic, story-telling sequences the dancers create for this piece, while the rhythm supports the sequence of movements choreographed to fit the beat. In some classes, participants pay particular attention to a variety of rhythms by listening to them played on the piano or clapped by the accompanist,

then clapping them out. Participants derive obvious pleasure from the well-known classical music, Broadway songs, and popular tunes that are played. Sometimes we all just spontaneously sing along.

Internal imagery

Imagery is perhaps the most effective cognitive strategy dancers use to learn movement sequences and to create particular effects while dancing, although cognitive strategy is probably not how dancers would label the process of conjuring up in the “mind’s eye” a representation of a movement effect they are trying to achieve. Thus in the class, instructions very often point out the shape a movement makes in space; for instance, “curve your arm around in front of you, continuing down, up and over, completing a full circle in the air.” The desired quality of movement for a sequence is almost always explained through imagery: “Vamp it up! Make eye contact with someone across the circle from you and move your upper body seductively.” “Lower your arms softly, as though they are floating down on top of gentle wafts of air.” “To help yourself stand tall, imagine you are a puppet and a string is pulling your head, neck and torso up to the ceiling.” No matter what kind of movement is involved, or even when standing still, in dance, the effect of the whole body is important, not just one part. Imagery evoked, therefore, tends to create a picture (representation) of how the whole body should move together.

Aural and visual inputs

As noted, participants hear the rhythm of the accompanying music and respond to the musical effect and also to the beat. Teachers usually also call out what movement to do in sequence, and at the same time they are dancing too, so that participants have 2 aural guides and a visual guide.

Tactile input

While in the center of the room, participants often perform sequences holding

hands, in a circle or line, adding touch or somatosensory input to aural and visual inputs. Dancers rely on light touch to focus attention on balance. That's why in the beginning of a ballet class, students lightly touch the barre, and it is one of the reasons why in a pas de deux ballerinas make light contact with their partners' fingers when executing a sequence that requires extreme concentration on balance.

Both dancers and neuroscientists know that touch synchronizes (entrains) movement. In 19th century, romantic ballets members of the corps often hold hands or clasp at the waist while dancing. Such connections create a beautiful pattern, but they also enhance synchrony of movement. In "Rhythms of the Brain," neuroscientist Gyorgy Buzsaki describes oscillatory synchrony with the example of romantic couples holding hands, which results in their walking in perfect unison, and notes that this will not happen if a couple does not hold hands.^{4(p168)} This phenomenon occurs in Dance for PD classes too, for example, when participants join hands in a circle and perform a walking pattern. Synchrony ensues.

Repetition, variations on familiar sequences, and new sequences

Repetition: As in a traditional dance class, constituent parts of movement sequences and dance steps are practiced over and over again. A basic tap step called the perrididdle, for instance, consists of 4 parts continually repeated in the same sequence on one foot and then the other, repeat, repeat, repeat: (1) strike the heel ("dig") of one foot while standing on the other; (2) spank the floor with the ball of that foot and lift it up; (3) step down again on the ball of the same foot; and (4) drop the heel of that foot to the floor. Then shift weight and do the same thing with the other foot. In the class, the parts of the perrididdle and the whole perrididdle are done while seated as part of warm-up for the feet. A perrididdle tap routine is

done again while holding on to the barre with both hands, many, many times. Likewise port de bras arm curves and upper body stretches may be used during seated warm-up exercises, as upper body accompaniment to plies done at the barre and in choreographed pieces in the center.

Variation: The dance leaders vary familiar sequences, changing speed, quality of movement, parts of the sequence, etc. In one familiar sequence for instance, the forearm is moved from a bent elbow close to the body out to horizontal position in front. The dance leader asks participants alternatively to "make it sharp," "make it smooth." (Accompanying music is also alternatively sharp or smooth, as is the dance leader's voice in calling out the movement.) These kinds of movement quality variations focus mental attention on movement control.

New sequences: Entirely new sequences are taught. New sequences present a mental and physical challenge, and they are learned over time with practice. It is hoped that exposure in class to the strategies and sensory input dancers use to control movement will assist participants in learning and executing new movements.

Low key, supportive instruction

Participants are often reminded that starting a sequence with the left arm or right arm or leg will work, and not to worry, sequences take time to grasp mentally and to execute. Participants may be helped individually to adapt a sequence to fit movements they are able to do. Teachers encourage for instance, good posture, stretching, lifting the foot, but do not individually correct participants' efforts.

Teaching of choreographed dance sequences.

Teachers lead the class in performance of an expanding repertoire of dance sequences, for instance, jazz-based Broadway chorus line

style numbers, dancing the gang rumble scene from “West Side Story” (perhaps the favorite), simplified segments of dances choreographed by Mark Morris for MMDG, square dances, pantomime stories.

Performance of free form dance sequences created by groups of participants

Grouped in pairs or groups of 3, either seated or standing, in each group 1 or 2 persons follow the moves (mirror) the designated choreographer who moves in response to the music in whatever way he or she chooses. Sometimes the pianist changes the tempo and musical style, which then affects the choreographers’ moves. Each person in a group has time to be the choreographer. The dance leader may make suggestions that expand choreographic effects. (“Followers, see if you can watch the choreographer and then copy the movements trailing behind just a little.” “Let’s try responding to one another’s moves. One person in each group, create a sequence and then stop so that your partner can respond to your moves with a sequence—like a conversation in movement.”). The resulting duets and trios display a wide variation in styles and beauty and are wonderfully synchronous. In one class, groups were asked to dance playing a sport they liked for the rest of the class. Choreographing together in small groups requires mental and physical concentration on movement, self-reliance, cooperation, and gives participants a chance to get to know one another.

Taking advantage of spontaneity

One day a participant with PD who came in 10 minutes late glided across the room to get to an empty chair on the far side, swinging her hips and smiling. The pianist started to accompany her. Everyone clapped, and the teacher immediately suggested everyone stand up and dance across the room to another chair, dancing together with others along the way if they feel like it, which we all did. In another class, a participant in a motorized wheelchair, ev-

idently stimulated by the music, decided to move to the middle of the circle where the teacher immediately joined him for a duet which pleased everyone. We have learned that participants are reluctant to agree if asked to dance solo, but sometimes an opportunity for spontaneous dance occurs and the dance leaders take advantage when it does.

DANCE FOR PD CLASSES: DEVELOPMENT OF CONTENT

BPG and MMDG collaborate

The dancers and I offer feedback and suggestions via e-mail to provide a record of thoughts and ideas about the classes. It is sometimes hard while teaching, for the dancers to gauge participants’ performance. An e-mail note that some participants take longer to learn sequences than others has led to more time spent breaking down each sequence into movement parts for practice several times before practicing the total sequence, and repeating it with music 3 or more times.

The dancers translate suggestions into dance sequences. Three examples are as follows:

1. Because one side of the body in PD is often less responsive than the other, I requested a sequence to promote paying attention to movement on both sides of the body. Dancers responded with a variety of opposition sequences; for example, while seated, one arm starts up in the air, the other hangs down by the foot. Each hand consecutively moves to touch shoulder/knee, knee/shoulder, and ends with the opposite arm up in the air and down by the foot, a sequence that requires practice and attention to master for dancers as well as persons with PD. Such a sequence evokes discussion because it is hard to do. Dancers and participants talk about what works for them, for example, fingers touching the body in transit from one stop to the next

(somatosensory input), copying the teacher's movements (visual input), "just doing it and not thinking" (both dancers and muscle physiologists call this muscle memory), "thinking about what the sequence looks like" (imagery), "lots of practice."

2. A request for moving across the floor using methods dancers use to travel across a stage, as a way to get participants to think about and use eyes, head, arms, legs, and feet while they walk, has resulted in spending 10 to 20 minutes in many classes for jazzy walks snapping fingers in sync with the music, doing the grapevine holding hands, marching with high steps, exaggerating each step as a lunge accompanied by an exaggerated arm swing upward in the front to horizontal level with the floor.
3. A request for a sequence incorporating ways to stand up from a seated position and sit back down again became a sit-to-stand, stand-to-sit circle dance, each person standing up, walking to the next chair (sometimes around his or her own chair) and sitting down again. Dance leaders demonstrate how dancers use momentum and the head, which is heavy, to generate energy to get up from a seated position. If persons have a hard time getting up and sitting down on their own, but want to try, they are helped, usually by someone next to that person, not necessarily the caregiver, friend, or attendant. If a person feels tired or does not want to try he or she does not participate. Usually most people participate, completing the full circle by sitting, standing and walking from chair to chair.

Classes are interactive: Dance leaders and participants collaborate

A comment from one participant about painful stiffness in the neck and shoulders led

to more ballet port de bras sequences during warm-up; slowly gliding curved arms over the head, sideways, behind the back, below the knees (while seated), with accompanying head and neck curves. A complaint about dizziness led to a discussion of how dancers learn where to focus the eyes to counteract dizziness, and to direct movement. Dancers often include where to look as part of instruction. Positive feedback from teaching a tap step and Bob Fosse style isolated body part jazz moves, has led to learning, practicing, and performing bits of tap and jazz sequences. During the class, participants are encouraged to ask questions. In their comments participants sometimes mention PD and talk about its effects. The dance teachers do not relate their instruction to PD and do not mention PD.

RESULTS

Quality of Life Scale

In March 2006, after the classes had been held once a week for 17 months, BPG wanted to find out what in particular about the classes is most appreciated, as a source for development of a questionnaire more specifically targeted to perceived effects of "Dance for PD." Participants were asked to complete the 16-item Oregon Health & Sciences University version of the Quality of Life Scale (QOLS) (Appendix 1). This scale is validated for persons with chronic diseases. It was used because its aim is to measure overall estimate of quality of life, beyond issues only related to health, and it is short. On a scale from 1 (*Terrible*) to 7 (*Delighted*), respondents are asked to describe how satisfied they are in 3 domains: (1) health, (2) relationships and material well-being, (3) personal, social, and community activity. BPG added a 17th item, "Moving around: walking, standing up," which would fit into the domain of movement disorders. After marking how satisfied they are on the 17 items, respondents were asked to note whether they felt any of the items had changed for the better as a result of attending "Dance for PD" classes, and if so,

Table 1. Self-assessment of dance class participants with PD to Quality of Life Scale

Items	1: Terrible	2: Unhappy	3: Mostly Dissatisfied	4: Mixed	5: Mostly Satisfied	6: Pleased	7: Delighted
Active recreation (15)			2	2	3	3	1
Socializing (13)			3	1	1	5	2
Feeling fit (2)		2	2	4	3	1	
Understanding yourself (10)		1	1	3	2	4	1
Learning (9)			1	1	3	6	1
Expressing yourself (12)		1	2	2	5	1	1
Participating in organizations (8)	1		1	2	4	2	2
Helping others (7)	1		1	1	3	4	2
Reading, music, entertainment (14)			1		3	3	5
Moving around (17)		2	1	3	3	3	
Independence (16)			1	1	4	4	2
Family relationships (3)				2	4	5	1
Work (11)			2	2	5	3	
Close friends (6)			1		4	4	3
Close relationships with spouse (5)		1		2	2	3	4

*Responses to Oregon Health and Science University version of the Quality of Life Scale (QOLS). Above are ratings for each QOL item by the 12 persons with PD who also noted after filling out this QOLS, which items had "changed for the better" as a result of attending "Dance for PD" classes. Items are listed in order from highest number of improvement responses to lowest. In this table, the numerical scores 1 to 7 reflect patients' self-assessment of their condition. They do not reflect self-assessment of improvement. Number in each of the cells indicates the total number of responses received. Item 1 (material comforts) and item 4 (rearing children) are not included in the table because, as would be expected, none of the responders noted these items had improved because of attending "Dance for PD" classes. Item 17 (moving around) was added to the QOLS.

which ones. Table 1 shows the number of responses each item number received. Respondents were also asked to give their age, sex, year of diagnosis with PD, and if they come to class as often as possible.

Twenty-one responses were returned; of these, 15 were from persons with PD. UPDRS scores were not factored in. From observation of persons who happened to be in class the day QOLS questionnaires were handed out, the respondents were in stages 1 to 4. Age range of respondents was 50 to 87, with 2 in their 50s, 4 in their 60s, 6 in their 70s, 2 in their 80s, and one who did not note age. Length of diagnosis of PD ranged from 1 to 10

years. Of respondents with PD 7 were male and 8 female. All 21 respondents noted they come to class "as often as possible."

The 3 items that received the highest number of responses (8) that they had "changed for the better as a result of attending Dance for PD classes" were item 15, "Participating in active recreation," item 13, "Socializing—meeting other people, doing things, parties, etc.," and 2, "Health—being physically fit and vigorous." There were no negative responses "changed for the worse" as a result of attending Dance for PD classes.

The 2 items that received the second highest number of responses (7) were

Item 10: “Understanding yourself—knowing your assets and limitations—knowing what life is about...” and item 9, “Learning—attending school, improving understanding, getting additional knowledge.”

Item 12: “Expressing yourself creatively,” received 5 responses.

Item 8: “Participating in organizations...” received 4 responses.

Three items (7, 14, and 17) received 3 responses each, Helping and encouraging others..., “Reading, listening to music or observing entertainment,” “Moving around: walking, standing up,” (added by BPG).

Item 16: “doing for yourself,” and item 3, Relationships with parents, siblings,” received 2 responses, and 1 response each was received by items 11, 6, and 5, “Work,” “Close friends and “Close relationships with spouse...” No one responded that item 1, “Material comforts” and 2, “Having... children” were improved through dance classes.

Responses to questions asked by Misty Owens, one of the dance leaders, for her master’s thesis in dance on the “Dance for PD” Program

At the same class at which the QOLS was handed out, Misty Owens, one of the dancers who lead the class, asked 5 persons who have PD to respond via e-mail to questions about the effect of the classes on them, as part of her thesis on the “Dance for PD” program for her MFA in dance from the University of Wisconsin at Milwaukee. Persons who responded are 3 women E., aged 64, diagnosed for 10 years; L., aged 50, diagnosed for 6 years, and M., aged 51, diagnosed 1 year; and 2 men, C., aged 64, diagnosed 10 years, and B., 71 diagnosed 6 years.

Key words taken from the 5 responses to 4 of the questions Misty asked appear below. These questions are not validated, but they ask specifically about the effects the dance classes have on persons with PD. Complete

text of the respondents to these questions is given in Appendix 2.

Key words

1. “*How does your body feel after our dance class ends? Please describe.*” Key words: much better, light, floaty, graceful, relaxed, invigorated, high energy, exhilarated, more flexible, symptom-free.”
2. “*How do you feel in your mind after the dance class ends?*” Key words: run and leap, smiling, courageous, sorry it’s over, much happier, a little spacey, good mood, focused and clear.”
3. “*Do you feel the consequences of the class impact your quality of life on a daily basis? How?*” Key words: “fulfilling, empowering, optimistic, inspired, flexible, confident.”
4. “*What do you believe specifically makes this dance class work for you? What brings you back to class each week? Please describe.*” Key words: “promotes possibilities, interactions, participation, learning, feeling symptom free, hope, joy, being fluid and graceful, comfortable, anxiety-free, cheerful, enjoying the movements, connections with others, feeling great.”

DISCUSSION

Dance for PD classes were developed in response to a perceived need for persons who attend BPG support group meetings to participate together in a community-based social activity, as equals, as just persons, rather than as patients with PD or as caregiver. A shared activity open to everyone in the support group would, it was thought, help with sadness, frustration, and preoccupation with PD, thereby improving mood. Dance was chosen because the exhilarating mental and physical effects of dance were well known from personal experience and because of what was seen as a potential benefit to persons with PD from learning

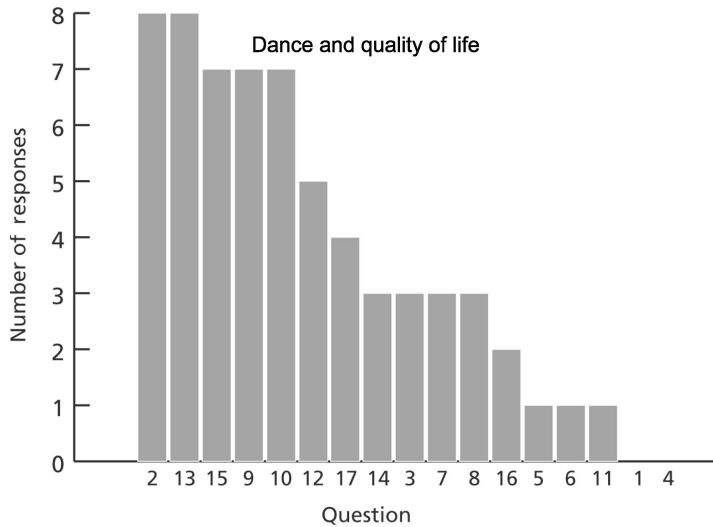


Figure 1. It shows the number of responses (vertical axis) in each of the 16 item self-rating QOL scale, and to item 17, “moving around, walking, standing up,” added by BPG. Numerical scores of 1 (*terrible*) to 7 (*delighted*) represent patients’ assessments of condition, not degree of improvement. After completing the QOL questionnaire, BPG asked respondents to note which of the 17 items had improved as a result of coming to the dance classes. Fifteen persons with PD completed the QOLS of whom three did not note whether or not there had been improvement. This figure shows that about half of all respondents felt most improvement in “Participating in active recreation” (#15), “Socializing-meeting other people, doing things, parties, etc” (#13), and “Health—being physically fit and vigorous” (#2), with “Understanding yourself” (#10), and “Learning” (#9) slightly behind. “Expressing yourself” (#12) received 5 responses and “Participating in organizations” (#8) received 4. All other items 3 to 1 response, with zero responses to “Material comforts” (#1), and “having/rearing children (#4). See Appendix 2 for the complete QOL. Responses received will be used to develop a new QOL questionnaire that is more targeted to eliciting responses to the areas of life participants feel improve through dance.

about and practicing in the same way dancers do, the conscious, attentive use of imagery, and all sensory inputs to learn and control movement.

We used the QOLS to determine what effects of the Dance for PD classes are most appreciated by participants. The scale does not address the potential usefulness of learning methods dancers use to control movement. Item 9 does ask responders to rate “Learning . . . improving understanding, getting additional knowledge,” which received 7 responses, but it is unclear whether responders were thinking about the kind of heightened mental concentration on movement that is taught in a dance class. In the open-ended questions, only one person commented on this aspect of the classes (question 1) that

they “inspired me to . . . monitor my motion.” In the class, persons with PD do comment for instance, that “I didn’t know I could do so much,” and caregivers comment that they are quite surprised at how much the persons with PD are able to do. It is known that music is able to help persons with PD synchronize their walking rhythm to a musical beat² and this does indeed happen in class. Whether retention of learned movement sequences is improved via practice is not known. It is hoped that through further research it will be possible to learn more about whether persons with PD can benefit from learning methods dancers use for movement control.

Responses as to which items on the QOLS had improved as a result of coming to “Dance for PD” classes (Fig 1 and Table 1) can be

viewed as confirmation that dance does make participants feel better, and feeling better is associated with improved mood. As was assumed, the items that responders noted most often had improved as a result of the dance classes were recreation (item 15, "Participating in active recreation"), being with other persons (item 13, "Socializing"), and feeling better physically (item 2, "... being physically fit and vigorous"). The opportunity for socializing before class starts and also during class when working together in groups is what most probably contributes to this finding. Personal contact and conversation make the dance classes more meaningful and cohesive because participants have a chance to get to know one another.

Perhaps the high number of responses to item 2, feeling better physically, could be seen largely as the result of the combination, physical exercise, and heightened mental activity. It is interesting to note that 4 persons rated themselves for "feeling fit" as "pleased" and "mostly satisfied," while 8 responses to item 2 assessed feeling fit as "mixed" (4 responses) and "unhappy" (one response) yet 8 persons said there had been improvement in feeling fit as a result of dance.

Music and imagery, we believe, play a role here. They are 2 essential aspects of a dance class, and they are intimately linked. Dancers respond to the images that music evokes, and in turn make conscious, active use of these images to affect the quality of their movements. A study of the effect on persons with PD of music therapy (MT) lends some support to this possibility. Music therapy makes use of both music and imagery in an alternative medicine model of care, to improve emotional state and motor control in all kinds of patients. A study of the use of active MT in PD showed that MT had a positive effect on motor abilities and emotional status and led to improvement in activities of daily living and quality of life.⁵ It is interesting that item 17 added to the QOLS, "moving around, walking, standing up" received far fewer responses than item 2. If the lower rating of item 17 were duplicated in

a much larger study of the effect of Dance for PD on quality of life, it might suggest that improvement in mood results more from feeling better physically which is connected to mood than from self-evaluation of actual improved ability to move.

Although only 5 persons with PD were asked to comment directly on the effect of the dance for PD classes, and these questions have not been validated, their responses ("lots of feeling happy," "floaty, even graceful," "exhilarated," "invigorated," "definitely good mood," "more courageous," "empowering," "fabulous fun," "more optimistic," "more confident," etc) are a better reflection of the very positive mood enhancing response that participants have to these classes (Appendix 2) than responses to the validated QOLS.

Exercise is now recognized by the American Academy of Neurology as an alternative therapy for PD that "may be helpful in improving motor function,"⁶ but its report notes that the "magnitude of the observed benefit was small," and "not sustained after exercise therapy was discontinued." All 21 respondents to the QOLS said that they attend classes as often as possible. "Dance for PD" classes have the potential to motivate persons with PD to make physical exercise a part of their lives. It is known that for older adults regular exercise improves physical functioning and emotional well-being, but getting older adults to exercise, particularly those who are disabled, is difficult. Less than a third exercise regularly.⁷

Even if future research on the effect of Dance for PD classes shows that the magnitude of physical improvement is small as the American Academy of Neurology found is true for exercise therapy, they could contribute to overall quality of life of persons with PD and caregivers. Dance is not only a physical activity but also a social activity and an absorbing mental activity that engages emotions and the imagination. In addition, the correspondence is striking between how dancers use mind and stimuli to control movement and how mind and stimuli have already been shown to

help persons with PD. More widespread implementation of “Dance for PD” classes and validation are needed.

Please Note: Because of considerable interest in the “Dance for PD” classes, BPG and MMDG have created a video about our classes

and organized a workshop that we hope will be beneficial for dancers and persons in the PD community who would like to develop their own Dance for PD classes. For more information, please contact BPG. brooklyn-parkinsongroup@earthlink.net.

REFERENCES

1. Lewis GN, Byblow WD, Walt SE. Stride length regulation in Parkinson's disease: the use of extrinsic cues. *Brain*. 123;10:2077-2090.
2. Thaut M, McIntosh KW, McIntosh GC, Hoemberg V. Auditory rhythmicity enhances movement and speech motor control in patients with Parkinson's disease. *Funct Neurol*. 2001;16:163-172.
3. Hoehn MM, Yahr MD. Parkinsonism: onset, progression, and mortality. *Neurology*. 1967;17:427-442.
4. Buzsaki G. *Rhythms of the Brain*. New York: Oxford University Press; 2006.
5. Pacchetti C, Mancini F, Aglieri R, Fundaro C, Martignoni D, Nappi G. Active music therapy in Parkinson's disease: an integrative method for motor and emotional rehabilitation. *Psychosom Med*. 2000;62:386-393.
6. Suchowersky O, Gronseth G, Perlmutter J, Reich S, Zesiewicz T, Weiner WJ. Practice parameter: neuroprotective strategies and alternative therapies for Parkinson disease (an evidence-based review). *Am Acad Neurol*. 2006;976-982.
7. Prohaska T, Rimmer J. *Promoting Exercise in Older Minority Adults and Those With Disabilities*. Vol 3. Roybal Issue Brief. Chicago, Ill: Midwest Roybal Center for Health Maintenance; 2001;1-7.

Appendix 1

Quality of Life Scale*

Please read each item and circle the number that best describes how satisfied you are at this time. Please answer each item even if you do not currently participate in an activity or have a relationship. You can be satisfied or dissatisfied with not doing the activity or having the relationship.

(Note: Participants were asked to rate their feelings on a scale of 1 to 7: *Terrible, Unhappy, Mostly Dissatisfied, Mixed, Mostly Satisfied, Pleased, or Delighted*).

1. Material comforts—home, food, conveniences, financial security.
2. Health—being physically fit and vigorous.
3. Relationships with parents, siblings & other relatives—communicating, visiting, helping.
4. Having and rearing children.
5. Close relationships with spouse or significant other.
6. Close friends.
7. Helping and encouraging others, volunteering, giving advice.
8. Participating in organizations and public affairs.
9. Learning—attending school, improving understanding, getting additional knowledge.
10. Understanding yourself—knowing your assets and limitations—knowing what life is about.
11. Work—job or in home.
12. Expressing yourself creatively.
13. Socializing—meeting other people, doing things, parties, etc.
14. Reading, listening to music, or observing entertainment.
15. Participating in active recreation.
16. Independence, doing for yourself.
17. Moving around—walking, standing up (17 was added by BPG)

After completing the QOLS, respondents were asked by BPG:

“Have any of the numbered items, 1 to 17, changed for the better as a result of attending the Dance for PD classes? If so, please write the numbers below.”

*Adapted by Oregon Health & Science University for groups with chronic illness.

Appendix 2

E-mailed Responses on Effect of Dance Classes Received From 5 Participants With Parkinson’s Disease

The responses below are to questions concerning the effect of the classes, asked via e-mail by dance leader Misty Owens, for her MA thesis on the “Dance for PD” Program. Responses are from 5 of the participants who also answered the QOLS. Age, sex, and length of diagnosis of PD are as follows: F. 64, female, 10 years; C. 64, male, 10 years; M. 61, female, 1 year; L. 50, female, 7 years; B. 72, male, 5 years.

1: How does your body feel after our dance class ends? Please describe.

F: Much better, particularly in my arms. Even though I take exercise classes 2 times a week besides our class, our class has a much bigger impact on the way my arms feel as a result of the way we use them (pushing up and around and back and forth). Also I feel much happier after the class than I do in most places. It’s such a joy having William’s wonderful music, your wonderful dance, (and John, David and other dancers) and lots of feeling happy.

C: The duration of my period of normalcy varies. It always lasts until after the end of the dance class. However, at some point PD symptoms return. Sometimes on the way home. Sometimes thereafter. I do not often notice when or where the return occurs.

M: Light, floaty, even graceful. High energy. Snapping my fingers, singing, etc.

L: I usually feel energized, exhilarated and symptom-free. Looser, I think.

B: "I am relaxed, invigorated and more flexible."

2. How do you feel in your mind after the dance class ends?

F: ... As though I could run and leap ... and enjoy smiling and talking to the others. ...

C: Always sorry that class is at an end. And I feel "normal" i.e., symptom-free for a while.

M: A little spacey, a little high, definitely good mood, filled with music.

L: Focused and clear.

B: A little fatigued and much more courageous about walking. I feel good about myself, I'm at ease.

3. Do you feel the consequences of the class impact your quality of life on a daily basis? How?

F: It provides a feeling that ... my future life incorporates opportunities that will be fulfilling, and therefore empowering.

C: A very positive effect. At other times ... I may not feel as free of PD symptoms ... But because I am symptom-free during class, I know that I can be ... that knowledge has an ongoing positive effect on my attitude.

M: Well for one thing it's fabulous fun—like stepping into a totally loving kind and beautiful universe. Inspired me to buy CDs, to keep music in my daily life. And to monitor my motion.

L: I feel more optimistic about my PD and being able to do well for a long time and inspired by all the others who are doing so well ...

B: I believe I am more flexible and more confident in my ability to walk.

4. What brings you back to class each week?

F: ... interactions with all of us, ways of helping each other, getting to know each other, learning together, promotes possibilities rather than a lack luster future ...

C: ... positive feeling that I derive from the magical ability of the dance classes to free me from posture and gait problems temporarily ... hope that the experience instills in me ... joy of the experience ... performing movements relatively free of embarrassment and inhibition ... the comfortable, anxiety-free company of this group who do not assume ... that a person with PD may not be able to do whatever is called for.

M: Welcoming part of it. ... William and the music ... the dancing, the Mark Morris-y bits we get to do. I floated on Dido & Aeneas (Mark Morris choreography) ... the variety ... I like it when we go over a routine enough so I can do it without watching. ...

L: ... it's the mixture of knowing this is good for my body ... I enjoy the actual movements, the LIVE music ... (an essential ingredient!) ... connection with so many others with PD ... and I feel really great after class ends.

B: The teachers, the group of participants who are very kind and accepting and the results of what it does for me.