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**INTEGRATIVE PATIENT-CENTERED CARE**

Dear Editor:

We would like to thank the authors of "Response to a Proposal for an Integrative Medicine Curriculum."<sup>1,2</sup>

We share their commitment to respectful collaboration among diverse health professionals, and are grateful for the thoughtful, detailed, constructive concerns and suggestions expressed in the paper.

The Consortium of Academic Health Centers for Integrative Medicine (CAHCIM) ([www.imconsortium.org](http://www.imconsortium.org)) continues to evolve in its understanding and activities as it continues its basic commitment to patient-centered care. We welcome contributions such as this that will enhance future care and look forward to developing and strengthening our ACCAHC (Academic Consortium of Complementary & Alternative Health Care) and OCCIM (Oregon Collaborative for Complementary & Integrative Medicine) collaborations.

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**A YOGA-BASED EXERCISE PROGRAM TO  
REDUCE THE RISK OF FALLS IN SENIORS:  
A PILOT AND FEASIBILITY STUDY**

Dear Editor:

More than a third of adults ages 65 years or older fall each year,<sup>1,2</sup> and nearly 13,000 people ages 65 and older died from fall-related injuries in 2003.<sup>3</sup> People who survive falls often suffer from hip fracture,<sup>4,5</sup> debilitating injury, decreased ability with daily activities,<sup>6</sup> increased fear of activity, and depression.<sup>7</sup> A Cochrane review of interventions to reduce fall risk identified multifactorial intervention programs addressing medications, professional home hazard modification, and professionally prescribed strength and balance training and a t'ai chi group exercise intervention as likely to be beneficial.<sup>8</sup> Yoga would be an attractive preventive and therapeutic option if proved effective, in view of its nonpharmacologic nature and apparent benefit for strength and balance.<sup>9</sup> The purpose of the present feasibility study was to evaluate whether a specifically designed yoga-based exercise program can reduce fall risk in older individuals.

Men and women ages 65 years and older were recruited from a retirement community. Participants provided written informed consent to participate in this study, which was approved by the Scripps institutional review board. Participants then underwent eligibility evaluation that included a health questionnaire, history of falls, and fall-related injuries. The Folstein Mini-mental State Examination (MMSE) and Tinetti Performance Oriented Mobility Index<sup>2</sup> tests were used to ensure that participants could follow directions and were suitable candidates for participation in the exercise intervention. These tests were chosen for their common use in screening cognitive function and fall risk in frail elderly people. After medical histories were reviewed, subjects that met the study criteria completed the MMSE and Tinetti test. All participants that passed the medical screening also passed the MMSE (score > 27) and Tinetti Screening (score > 25).

Potential participants were excluded if they were unable or unwilling to complete the baseline assessment, or did not meet the study criteria. Exclusion reasons included: being age less than 65; reporting bodily pain greater than 4 on a scale of 0–10; or having a recent stroke, neurologic deficits involving lower extremities, symptomatic cardiopulmonary disease, metabolic syndrome, severe depression, concurrent use of antidepressants, severe osteoarthritis or osteoporosis, hip arthroplasty, active inflammatory arthropathy, or significant collateral ligament, anterior cruciate ligament or meniscal injury with biomechanical instability of the knee.

Individuals who qualified to participate in the study were assessed by using the Berg Balance Scale (BBS), One Leg Standing Test (OLST), and the Activities-specific Balance Confidence Scale (ABC Scale).<sup>10</sup> The reliability and validity of the BBS in assessing balance have been documented, both

TABLE 1. BASELINE CHARACTERISTICS OF STUDY POPULATION

Women	16
Men	6
Median age, years (range)	82 (69–90)
Mean number of medications (SD)	4.4 (2.4)
Number (%) who fell in last 12 months	9 (41%)
Number (%) who exercise regularly	19 (86%)

SD, standard deviation.

in nursing-home and community-dwelling older adults,<sup>10</sup> and it is a validated predictor of falls.<sup>11,12</sup> The OLS is a commonly used balance assessment of postural stability.<sup>13</sup> The ABC has been shown to be predictive of falls in the elderly.<sup>14</sup>

Each session was approximately 45 minutes in duration. No assistive devices or props were used. Each session began with a standing breathing exercise followed by a series of standing poses. Seated breathing and relaxation exercises were performed at the conclusion of each class. The poses were selected from the Hatha Yoga Pradipika<sup>15</sup> and included:

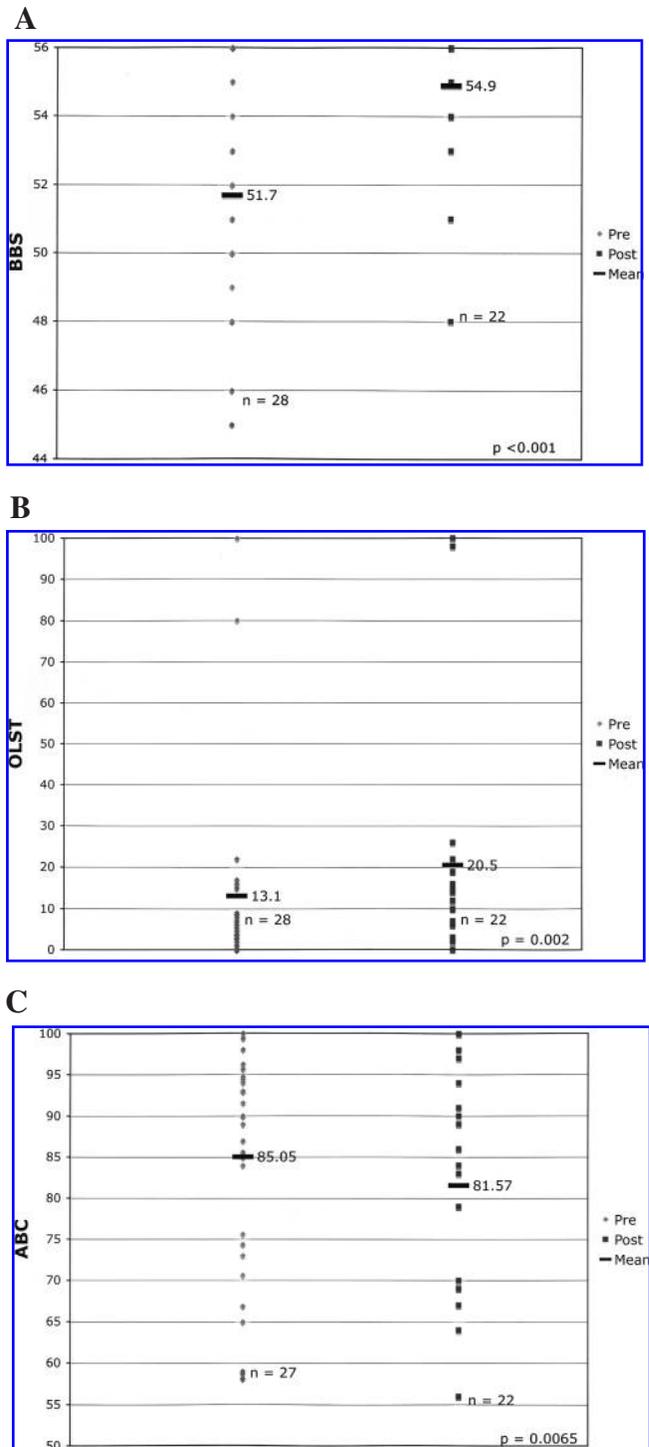
1. Standing *Pranayama* breathing with arm raises in Mountain Pose (*Tadasana*)
2. Half Moon Pose (*Ardha Chandrasana*)
3. Toe raises (*Talāsana* modification)
4. Single-leg balance (*Vrksasana* modification)
5. Awkward Chair Pose (*Utkatasana*)
6. Standing half forward bend (*Ardha Uttasana*)
7. Warrior (*Virabhadrasana*) “A”
8. Warrior “B” (*Tuladandasana* modification)
9. Warrior “C” (*Virabhadrasana* modification)
10. Modified kneeling lunge (*Anjaneyasana*)
11. Standing alternate arm/leg reach (*Tuladandasana* modification)
12. Arms behind back (standing *Bhujangasana* modification)
13. Seated *Savasana*.

Modifications were made to allow participants to assume the posture while striving toward full expression of the classical yoga posture. Floor exercises were not feasible as 40% of the participants could not rise from the floor independently.

Both absolute and relative changes in the outcome measures BBS, ABC, and OLS at 3 months compared to baseline were examined; this paper reports only absolute changes here, as results concerning relative changes were quite similar. The study utilized nonparametric procedures to examine the outcome measures because normality could not be assumed. Wilcoxon signed-rank tests were used to determine whether the absolute changes in each of the outcome measures were significantly different from 0. Mann-Whitney and Kruskal-Wallis procedures were used for subgroup comparisons, assessing whether the changes in outcome measures were related to gender, age, or attendance at the exercise sessions.

Demographics of the 27 participants that were enrolled are given in Table 1. The baseline fall rate in the study pop-

ulation was 38% which is similar to studies of larger elderly populations.<sup>2</sup> The dropout rate after 3 months was 18%. No falls or injuries occurred during the exercise classes. The yoga program was well-received. All subjects that finished



**FIG 1.** Changes in outcome measures for the 22 subjects. Measurements of Berg Balance Scale (BBS; **A**), One Leg Standing Test (OLS; **B**) and Activities-specific Balance Confidence Scale (ABC Scale; **C**) were performed prior (pre) to initiation and after (post) completion of the 3-month program.

the 3-month trial expressed interest in continuing the exercise program. Those who completed exit questionnaires indicated improvements in posture (25%), breathing (21%), stepping or walking (15%), coordination (13%), flexibility (13%), torso strength (8%), and reaching (6%).

Overall, 14 of the 22 subjects (63.6%; 95% confidence interval [CI] 41.7% to 81.3%) had improved BBS scores after 3 months relative to baseline; similarly, 13 of the 22 subjects (59.1%; 95% CI 38.2% to 79.3%) had improved ABC scores after 3 months, and 15 of the 22 (68.2%; 95% CI 45.1% to 86.1%) had improved OLST scores after 3 months. The median BBS change at 3 months was 3.5 (range -1 to 8;  $p < 0.0001$ , Wilcoxon signed rank test); the median ABC change at 3 months was -3 (range -20 to 3;  $p = 0.0065$ ); and, the median OLST change at 3 months was 3 (range -3 to 22;  $p = 0.002$ ). Individual values for these outcome measures are given in Figure 1.

The next investigation dealt with whether outcomes were related to gender, age, or attendance. There were no significant differences between males and females in any of the outcome measures (BBS, ABC, and OLST). Similarly, there were no significant differences on the basis of age nor on the basis of attendance.

This yoga program was designed specifically for fall prevention in the senior population. The program incorporates the key components of improving strength and flexibility of the torso, hips, and lower extremities; movement outside the base of support with various head positions; stepping; and reaching.<sup>2,16,17</sup> A majority of the poses in this yoga-based program challenge stride and controlling center of mass, which is associated with balance and occurrence of falls.<sup>18,19</sup> The program provides full weight-bearing exercise that has been shown to be well-tolerated by older people and to be of greater benefit than non-weight-bearing exercise.<sup>20,21</sup> Emphasis is also placed on control at the foot and ankle because studies have indicated that loss of sensation, strength, and reaction time<sup>18</sup> are problems in the elderly population and that these factors are associated with falls.<sup>20</sup> In a study of frail elderly subjects, a high-intensity ankle strengthening program improved balance.<sup>22</sup>

Only a small number of studies have examined the therapeutic or preventive efficacy of yoga, and many of these were pilot studies that were limited in the validity of their conclusions.<sup>23-30</sup> Pilot studies of yoga interventions have demonstrated increased hip range of motion and stride length,<sup>31</sup> and improved functional reach and stature measured by height.<sup>32</sup> Reduction in knee pain has also been demonstrated.<sup>28</sup> A yoga-based intervention enhanced performance on the BBS or Timed-Movement Battery tests in a group of 4 subjects.<sup>23</sup> A randomized 6-month trial in seniors was associated with improved single-leg balance and other quality-of-life measures compared to a control group.<sup>33</sup> In a program that combined *asanas* with various other yoga exercises, an improvement was noted in balance and gait but the *asanas* were not described.<sup>34</sup>

The present pilot study of a specific yoga program indicated beneficial effects on balance as measured by OLST and BBS scores. The decline in ABC scores may be explained by the subjects' greater awareness of their balance impairments. During initial testing 41% of the subjects could not hold the OLST 5 seconds or longer, which, in 1 study, increased the chance of an injury by falling.<sup>35</sup>

The results of this study provide new preliminary evidence regarding the effectiveness of a yoga-based program, that may justify additional studies to examine its effects on risk of falling and fall-related injury. Future studies could be directed at identifying appropriate pathologic groups and patient profiles that would most benefit from a cost-effective exercise program such as this.

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### SYMPTOM CHARACTERISTICS OF KIDNEY-YIN DEFICIENCY AND KIDNEY-YANG DEFICIENCY IN HONG KONG CHINESE MIDLIFE WOMEN

Dear Editor:

Kidney Deficiency commonly appears in the population age 40 and older<sup>1</sup> and postmenopausal women with vasomotor symptoms.<sup>2</sup> A China national diagnostic standard<sup>3</sup> classified Kidney Deficiency into Kidney-Yin deficiency syndrome (KDS-Yin), Kidney-Yang Deficiency Syndrome (KDS-Yang), and concurrent existence of the two syndromes. We conducted a study to investigate the patterns of symptoms of KDS-Yin or KDS-Yang in a clinical sample of 236 Hong Kong Chinese women age 40–60 years.

We constructed a KDS questionnaire with 26 symptoms from Chinese medical classics,<sup>3</sup> contemporary literatures,<sup>4,5</sup> and the authors' clinical experience to measure KDS-Yin and KDS-Yang. The KDS questionnaire was pilot-tested and independently evaluated by the authors and three senior experts. The final version included 24 symptoms with indicative guidelines for the severity scores, ranging from 0 (absent), 1 (mild), 2 (moderate), to 3 (severe). We excluded signs that required practitioners' subjective judgment and interpretation because this could lead to low diagnostic consistency.<sup>6</sup>

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