



Contents

Exercise and chronic pain
Kim D. Jones and Janice H. Hoffman
p. 1

Practical ideas from Active Aging 2005
p. 10

Call for presenters: Active Aging 2006
p. 13

Use imagery to encourage good posture
Ken Baldwin, MEd
p. 14

ICAA Functional levels
p. 19

Client handout: Are you hurting?
p. 20

Comment: Active aging goes beyond limitations
p. 21

Exercise and chronic pain: opening the therapeutic window

By Kim Dupree Jones, PhD and Janice Holt Hoffman

Acute pain is a vital, protective mechanism that permits us to live in an environment fraught with potential dangers. In contrast, chronic pain serves no such physiologic role. It is not a symptom, but a disease state.

Chronic non-malignant pain is both a sensory (nerve) and affective (emotional/cognitive) experience. It is defined as pain that lasts beyond the ordinary duration of time needed for an insult or injury to the body to heal. The dividing line between acute and chronic pain is commonly thought to range from 4 weeks to 3 months (1).

Historically, chronic pain has been under-treated or ignored altogether in the clinical arena, despite a great interest in the study of pain from both psychological and physical frames of reference. Consequently, many afflicted patients come to believe that pain is something they must simply endure.

Sometimes chronic pain resides in only one part of the body, as seen in chronic low-back pain. Other times, chronic pain is widespread, and/or has multiple symptoms present, such as the hallmark multiple-quadrant body pain seen in fibromyalgia. It is widespread, multi-symptom chronic pain we specifically address in this article.

It is unfortunate that exercise can be both a treatment and a stimulus of pain. The therapeutic window for exercise is very narrow (2). This means that, while too



much exercise increases pain, too little exercise will worsen pain through multiple mechanisms (pain posturing, deconditioned muscle microtrauma, neuroendocrine responses, for example) (3,4).

This pathophysiology requires specially tailored exercise, as well as movement modification during activities of daily living (reaching a high shelf, hair washing/drying, rising from a chair, housework and gardening, to name a few).

As the name implies, chronic pain is currently incurable. There is no single drug, surgical procedure, or other completely effective treatment. However, a treatment most closely linked to improved functional ability and quality of life is exercise.

The goal of an activity and exercise program is to open the therapeutic window just wide enough to improve daily function and fitness without increasing pain levels. We will provide an exercise prescription

Continued on page 2...



Appropriate for



Active
now



Getting
started



Needs a
little help

Continued from page 1

developed by the Oregon Health & Science University Fibromyalgia Research and Treatment Team that you can follow to help people discover how wide their own windows can open. In this article, we will use fibromyalgia as a primary example of chronic, widespread pain.

Fibromyalgia and chronic pain

Fibromyalgia (FM) is one of the commonest chronic pain syndromes, affecting at least 10 million Americans, and leaving an annual economic burden of an estimated \$15.9 billion in both direct and indirect health care costs. Women share a disproportionate burden of chronic pain. In FM, for example, 90% of patients are women, most commonly beginning in the fourth decade and peaking in the sixth decade (5).

An impressive body of research literature has established that pain in FM results from an abnormality of sensory processing within the central nervous system, referred to as “central sensitization.” As an analogy, central sensitization can be thought of as turning up the volume on an amplifier: loud is louder, light is brighter, pain is more painful, and in some individuals, even simply being touched becomes painful. Likewise, a simple muscle contraction may be painful and delayed-onset muscle soreness may be “overamplified.”

Post-exertion pain is also an issue, as found by the Oregon Health & Science University (OHSU) researchers. They demonstrated that hormones vital to tissue repair, like growth hormone and its long-term marker IGF-I (insulin-like growth factor), are inadequately secreted in FM (6).

Exercise opens the window

Those with chronic pain may have a hard time believing that any exercise, which so often worsens symptoms at the start, will have a good outcome for pain relief. And, individuals experiencing a significant pain flare are better off waiting until symptoms are stabilized before beginning a new exercise regimen.

However, once pain levels are stable, a careful exercise progression can often

provide great assistance in helping to moderate chronic pain over the long term. The selling points for promoting exercise to this population include:

- People with chronic pain who exercise regularly may require less pain medication for the same amount of pain relief.
- Specific resistance exercises can strengthen the muscles around sore joints, providing a natural bracing action that takes the load off bones and cartilage.
- Endurance exercise helps with weight loss, which also reduce stress to joints.
- Stronger muscles are less prone to muscle microtrauma, meaning less daily pain.
- Exercise done on a regular basis improves sleep and provides more energy to everyone, including those with chronic pain.

It is important to note that the typical endorphin release experienced by the general population is often not present in chronic pain exercisers. This group may go many months before exercise typically begins to “feel good.”

There are special techniques and a protocol fitness professionals can use with their clients and participants that will minimize post-exercise pain. The exercise progression outlined in the following steps was developed by the OHSU Fibromyalgia Treatment Team and tested in National Institutes of Health studies in fibromyalgia (7,8). The progressive steps are:

1. Good alignment and mind/muscle relaxation techniques
2. Flexibility training
3. Resistance training, from core to balance techniques
4. Cardio aerobic endurance training

Unlike training done with general population clients, the types of exercise are not combined at the start. By progressing one step at a time, the beginning participant will be able to gradually become more fit with the least amount of rebound pain. In other words, only when one step is successful will the next step be added.

Continued on page 3...



Continued from page 2

Step 1: Good alignment and mind/muscle relaxation techniques

Poor alignment can be caused by:

Pain postures, a response to pain. This happens especially in the upper body, where it's common to see individuals in pain with elevated shoulders, tightly contracted pectorals and weak posterior deltoids. Taking short, shallow breaths is also typical of pain posturing.

Professional sitting, a response to inactivity. A chronic pain sufferer will likely become inactive, at the least, sporadically. Extended seating causes tight hip flexors and hamstrings, often with erector spinae and abdominal muscle weakness. A forward head thrust is also common.

Loss of balance in opposing muscles, a response to both pain and inactivity. Those who are inactive are prone to develop imbalances in the overall postural musculature, and because these imbalances can lead to injury, this potentially can cause more pain over time.

Alignment/relaxation training specifics

Frequency: Daily

Intensity: Non-intense

Type: Standing and seated for alignment work, supine or seated for relaxation techniques

Postural awareness

Jumping right into flexibility stretches and strengthening exercise is not a good idea for the chronic pain client who has been inactive for over 3 months. Instead, step one involves only teaching postural awareness; the practice of beginning to place the body regularly in better alignment. (See "Postural awareness: finding neutral alignment" on page 4.) The deeper stretching and the strengthening that will correct misalignment will come a bit later.

Deep breathing

Deep, full breathing is the basic skill necessary for most relaxation techniques.



Classes for people with the chronic pain of fibromyalgia are held at the OHSU School of Nursing Exercise Research Facility.

Many people have "unlearned" the healthy abdominal breathing done automatically by infants and children. After many years of stress, tension and anxiety, adults wind up with abnormal breath rhythms. These changes are subtle and most people who ventilate this way don't realize that their breathing is disordered.

Patients with chronic pain typically take short, shallow breaths that result in only the chest and shoulders expanding on inhalation; the abdominal muscles (and diaphragm) often remain very rigid and tight. The goal is to learn to relax the diaphragm by softening the belly area, allowing better chest expansion so the lungs can fill more completely when inhaling.

Progressive muscle relaxation

Progressive relaxation is a technique developed by US psychologist Edmund Jacobson in 1929. Jacobson felt that there was a relationship between muscle tension and emotional tension, and that progressive relaxation could be an effective therapy for stress-related disorders.

Progressive muscle relaxation typically takes about 15 to 20 minutes. The procedure is usually practiced lying down but can be performed seated. Typically it

Continued on page 4...



Continued from page 3

begins with the feet and moves up the body. Each muscle group is tensed briefly, and then relaxed.

Teaching tip: In many chronic pain clients, muscles are already tight and may take longer to relax. In this case, leave out the tensing of muscles. Instead, simply call attention to various body areas, relaxing major muscle groups one at a time.

Autogenic training

The autogenic training (AT) technique uses both visual imagery and body awareness to move a person into a deep state of relaxation. The person is asked to imagine a peaceful place and then focus on different

physical sensations, sometimes also moving from the feet to the head as in progressive relaxation. At other times, the participant might focus on warmth, heaviness in the limbs, deep breathing and/or a calm heartbeat.

It is believed AT can help alleviate depression, reduce pain perceptions, lower fatigue and increase relaxation. AT is similar to self-hypnosis, as its practice involves imagining deeply enough that we visualize what we want to happen. Later, as we recall that mental image, the body responds with the same relaxation it experienced during training. Prewritten scripts for AT can be found in bookstores and online.

Continued on page 5...

Postural awareness: finding neutral alignment

1. Weight is even between the forefoot and heel

- Ask clients to sway back and forth from heels to toes and back, and then “come to center” with their weight feeling evenly distributed.

2. Knees are soft, not locked

- Have clients slightly bend and straighten their knees, ending with straight knees; then ask them to gently “unlock” their knees. Cue them for “straight legs, but soft knees.”

3. Pelvis is neutral

- Lead clients in a pelvic rock, moving the tailbone several times from anterior tilt to posterior tilt, ending with a flattened lumbar; and then request they release “just a little,” enough to allow a natural curve to return in the low back. Ask them to note their tailbone is probably pointed down a bit more now.

4. Ribcage is well positioned

- Ask clients to place one hand on the low sternum/zyphoid process area and their other hand over their navel; have them lower and lift the ribcage, ending with a lift, then “gently release and lower the ribcage.” Point out they may feel there is more space to breathe now.

5. Shoulders are back and down

- Instruct clients to move shoulders forward and back, ending with a backward pull; then ask that they “just release” the shoulders down.

6. Ears are centered above the shoulders

- With 2 fingers on the lips, clients leave the fingers in place and pull back, retracting the chin and moving the head backward. Allow them to relax, and then ask them to notice the new space between fingers and lips. Explain this is how far forward they were unknowingly carrying their head, causing needless neck strain. Have them notice their ears are now aligned right over the shoulders.



Where flexibility counts most in chronic pain

Muscles to stretch for postural benefits:

trapezius
pectorals
anterior deltoids
biceps
abdominals
hip flexors
iliotibial band
hip abductors
quadriceps
gastrocnemius and soleus

Continued from page 4

Step 2: Flexibility training

The next building block is flexibility. Stretching is an essential part of any complete exercise program, and it is vital for this population. Stretching will aid in the release of over-tightened muscle bands and, when properly performed, provides pain relief (7).

To begin, flexibility exercises will be range-of-motion, later adding static holds for correction of postural imbalances. In particular, elongating tight muscles near areas of discomfort (like the tender point areas found in FM) is also a major goal.

A prescription of cooling Flumethasone spray (often called spray-and-stretch therapy) may be helpful in reducing pain during initial flexibility work. Physical therapists are experts in myofascial release and spray-and-stretch technique, and it's advisable to refer clients who are experiencing troubling pain when beginning flexibility training.

Flexibility training specifics

Frequency: Every other day to start, if needed, building to a daily routine as soon as possible

Intensity: Begin with gentle range of motion work, slowly adding static holds for 10 seconds maximum to start, gradually work up to 30-second holds as tolerated

Type: Static stretches that allow the Golgi tendon organs to signal the muscle fibers to relax, while using the previously learned breathing techniques to help relax all muscles during holds

Special considerations/what to avoid

A warm bath or shower, or another activity that leaves the muscles loose and warm, is helpful for exercisers who begin to practice their stretching regimen daily at home.

Not all clients will be comfortable with the body placements needed for mat-work, or standing static holds performed during typical stretch poses. Instead, begin seated in an armless chair (later progressing to sitting on a stability ball when resistance work has begun).

For clients who have a shortened reach, either from pain or excess body fat, fitness leaders might use yoga-style stretch straps,



Photography: Oregon Health & Science University

elastic bands (like Dynabands or Thera-bands), and props such as towels or yoga blocks to help with correct body positioning.

Some people with chronic pain have joint hypermobility conditions—their joints easily move beyond the normal range without any sense of tightness to signal an end point. For these people, movement (even when comfortable) beyond the natural joint line may precipitate painful nerve impulses. When doing flexibility work with these individuals, it is helpful to model the correct body positioning and assure them that, although they may not feel the muscles being stretched, they are receiving the benefits they require.

Finally, ignore the 30-second stretch pose rule for these clients, shortening the static position time by performing 2 sets of 10-second holds instead. This will allow them to make good gains in flexibility as gradually as needed.

Step 3: Resistance training: core, peripheral and balance techniques

The third building block, resistance training, can reduce pain, fatigue and disrupted sleep if done in a specialized manner (9).

When starting to strength train a deconditioned exerciser, it's wise to begin with the core muscles, since this creates greater stabilization that will be useful for later muscle training. Upper body (peripheral) resistance work can be done

Continued on page 6...



Where resistance counts most in chronic pain

Muscles to strengthen for postural benefits:

- posterior deltoids
- rhomboids
- latissimus dorsii
- triceps
- erector spinae
- abdominals
- hamstrings
- hip adductors
- tibialis anterior

Continued from page 5

in a seated position to eliminate undue leg fatigue. By using a stability ball, more core work can also be included.

A lower body resistance program, utilizing standing balance techniques, can provide functional strengthening for weak lower body muscles. In our research work, we recently demonstrated people with FM have objective balance disorders and increased fall frequency compared to healthy controls (10).

We are currently using balance work in our research classes at OHSU to both strengthen the lower body and enhance proprioception, where possible. Books such as *Fallproof! A Comprehensive Balance and Mobility Training Program* by Debra J. Rose, are a valuable resource on these techniques.

Resistance training specifics

Frequency: Twice a week to begin, increasing to 3 times weekly if able

Intensity: Very light resistance to begin, gradually adding longer repetitions for endurance, and finally increasing resistance for strength

Type (tools used): upper body (free

weights, Dynabands or Thera-bands), core (stability balls), lower body/balance work (stability foot pads, low balance beams or vertical floor guides, ballet barre for support)

Special considerations/what to avoid

During resistance work with chronic pain clients, focus on the concentric phase of the contraction, and eliminate or ease the eccentric phase whenever possible. This technique is needed to avoid muscle microtrauma. For instance, in FM biceps muscle training, our OHSU fibromyalgia research team recommends that ‘the work’ be considered the lift (concentric phase), while the lowering (eccentric phase) is done with minimal resistance, by a gentle lowering release.

Likewise, muscles need to be unloaded (release the weight) between repetitions because there is a delayed return to resting baseline state in the muscles in chronic pain. This can be accomplished by alternating sides during training, or building a pause between every repetition.

Continued on page 7...

Sample personal training sessions

Session	Time	Posture	Warm-up	Range of motion	Cardio endurance	Cardio cool-down	Resistance	Flexibility	Relaxation
1	½ hour	X							X
2-3-4	¾ hour	X		X				½ X	X
5-6-7	¾ hour	X	½ X	X				X	X
8-9-10	1 hour	X	X	X			½ X	X	X
11-12-13	1 hour	X	X	X	½ X *	X	X	X	X
14-15-16	1 hour	X	X	X	X *	X	X	X	X

* or as tolerated
Relaxation includes progressive relaxation, breath work, autogenic training



Continued from page 6

For those with chronic widespread pain, movements generally need to be kept close to the mid-line of the body. Eliminate overhead repetitions, replacing them with exercises that allow the arms to be held below shoulder-level.

Tai chi, yoga and Pilates can all be wonderful sources of exercise, promoting balance and/or strength. However, modifying the movements to reduce overhead arm work, and eliminating long stance holds will keep these exercises in the safe range.

Step 4: Cardio aerobic endurance training

There is good evidence (11) that those with chronic pain benefit greatly from increased aerobic conditioning, but many individuals are reluctant to exercise in this fashion, fearing increased pain and fatigue.

Robert Bennett, MD, FRCP, and Sharon Clark, PhD, leading FM researchers, have found that an acceptable starting point for deconditioned patients is 2 to 3 daily exercise sessions of 3 to 5 minutes duration. The duration is gradually increased to 2 daily 10-minute sessions, then one daily 15-minute session. At this point, the ongoing goal of one 20- to 30-minute session performed 3 or 4 times per week does not look so daunting (12).

Cardio aerobic training specifics

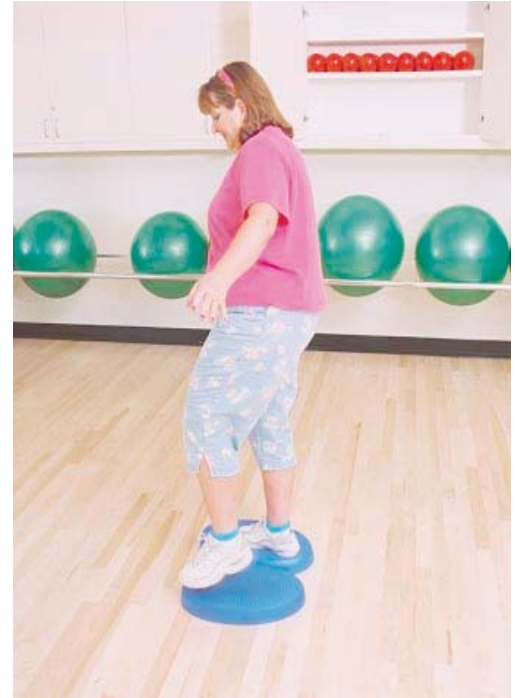
Frequency: Begin at 2 times per week, advancing to 3 or 4 times a week (or if very deconditioned, short spans of exercise throughout each day, as noted above)

Intensity: Aim for 60% to 70% of the maximal heart rate for 20 to 30 minutes. Most exercisers will not start at this level, but establishing a regular pattern of normal exercise will be motivating and rewarding to the client

Type: Low-impact exercise such as outdoor or treadmill walking, reclining stationary cycles and water therapy

Special considerations/what to avoid

Sessions lasting longer than 30 minutes are not necessary for these participants, and can actually produce diminishing returns.



Delayed-onset muscle soreness is a legitimate concern with chronic pain, but can be prevented during group cardio workouts by avoiding overhead arm movements, deep lunges and squats, and endurance-type repetition challenges.

Water workouts, so often advised for chronic pain, can be problematic due to the natural resistance properties of water. A fitness leader who understands how to reduce eddy and frontal resistance (the drag that occurs when moving through water) and can program repetition pauses, will help avoid excess fatigue. Avoid step, ramping, boot camp and martial arts style classes, where the norm is to perform repetitive movements or power combinations, because of the likelihood of muscle fatigue and joint stress.

Dizziness and neurally mediated hypotension (low blood pressure and the lightheadedness sometimes linked to fainting) are common complaints in FM patients. For dizziness, avoid quick turns during classroom cardio aerobics. Neurally mediated hypotension may also manifest as severe fatigue after exercise, after prolonged standing, or in response to physically stressful

Continued on page 8...



Continued from page 7

situations. Diagnostic tests, such as a tilt table test, can be performed to rule out this co-morbidity.

Opening the window for people in chronic pain

Exercise is essential in maximizing health and managing symptoms in chronic pain. However, exercise that is too intense or frequent may worsen pain in this population, and cause them to lose faith in exercise as a prescription for enhanced well-being.

Chronic pain conditions require specially tailored exercise, as well as movement modification, and a knowledgeable exercise leader can make a positive difference by reducing exercise attrition for this population (13). Utilizing the specific guidelines provided in this article for those

in chronic pain states will open the therapeutic window and enhance quality of life in this population. ▼

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Continued on page 9...

Program progression for chronic pain

	Frequency	Intensity	Type
Alignment and relaxation training	Daily	Non-intense	Standing and seated for alignment work, supine or seated for relaxation techniques.
Flexibility training	Every other day to start, if needed, building to a daily routine as soon as possible.	Begin with gentle range of motion work, slowly add static holds for 10 seconds maximum to start. Gradually work up to 30-second holds as tolerated.	Static stretches while using the breathing techniques to help relax all muscles during holds.
Resistance training	Twice a week to begin, increasing to 3 times weekly if able.	Very light resistance to begin, gradually adding longer repetitions for endurance, and finally increasing resistance for strength.	Upper body (free weights, bands), Core (stability balls), Lower body/balance (stability foot pads, low balance beams, vertical floor guides, ballet barre).
Cardio aerobic training	Begin at 2 times per week, advancing to 3 or 4 times a week (or if very deconditioned, short spans of exercise throughout each day).	Aim for 60% to 70% of the maximal heart rate for 20 to 30 minutes. Most exercisers will not start at this level.	Low-impact exercise (low-intensity dance aerobics classes, outdoor or treadmill walking, stationary cycles, and water therapy).



Continued from page 8

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Resources

30 Scripts for Relaxation Imagery & Inner Healing, Vol. I
Julie T. Lusk, editor
Whole Person Associates

Fallproof! A Comprehensive Balance and Mobility Training Program
Debra J. Rose
Human Kinetics Publishers
www.humankinetics.com

Fibromyalgia Network
Consider ordering their quarterly newsletter.
www.fmnetnews.com

National Fibromyalgia Association
Consider ordering their magazine, FM Aware
<http://fmaware.org/>

Oregon Fibromyalgia Foundation
Voted #1 in accuracy by rheumatology health professionals
www.myalgia.com

The Complete Idiot's Guide to Fibromyalgia
Lynne Matallana
Alpha books

The End of Stress as We Know It
Bruce McEwen and Elizabeth Lasley
The National Academies Press

The Relaxation and Stress Reduction Workbook
Martha Davis, Matthew, PhD, Elizabeth Robbins Eshelman, Matthew McKay
MJF Books

Thera-Band
resistive exercise bands
www.thera-band.com

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ICAA Resource

For more information on exercise programs for fibromyalgia, ICAA has a 100-page workbook "Exercise and Fibromyalgia" by Gwen Hyatt, MS. A continuing education course is also available.
www.icaa.cc/educational_products



Tips From the Field

Practical ideas from Active Aging 2005

At the ICAA Active Aging 2005 conference, sessions covered topics from marketing and wellness center development to exercise and activity options. Following are brief reports from a few of the sessions, gathered from the presenter's handouts and attendee notes.

Activity toolkit

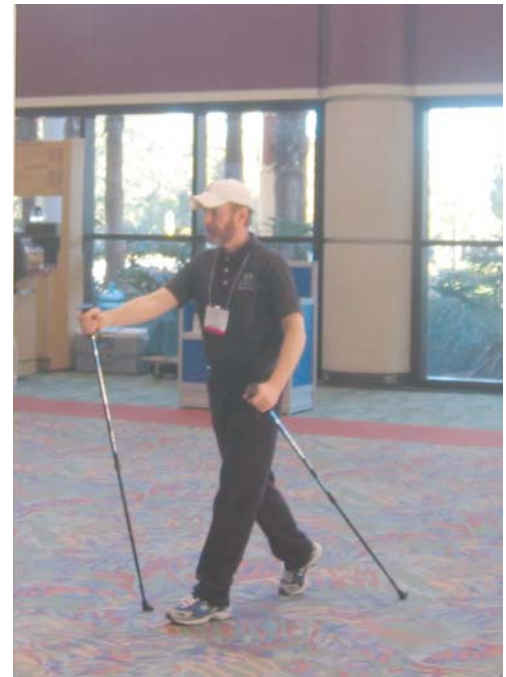
Michael Fleming, MD
Keynote: How the Medical and Fitness Communities Can Work Together

As a physician who has been in practice for 29 years, I've watched many patients who aged actively and many inactively. I believe over time we will be able to do things to live longer. But, right now, what can we do? I believe the best things seniors can do are:

- participate in physical activity with others, as part of a group
- stay mentally active, alert and engaged in life through working, teaching others and hobbies

What we need to do is be honest about what it will take to stay healthy. It's not a pill. Go to the American Academy of Family Physicians web site (www.aafp.org) and click on AIM, the Americans in Motion program. You can order a free copy of the "AIM to Change" toolkit, which contains resources and practical advice to help family physicians interact with patients in an office or community setting. One of these tools is a prescription bottle. When you open it, there are no pills—there is a pedometer.

I challenge you to approach your physician and see what you can do together. We can partner, and we can make a difference to help our seniors.



Falls prevention

Debra J. Rose, PhD
Nuts and Bolts of Assessing and Programming for Older Adults with Balance and Mobility Disorders

There are many identifiable risk factors for falling: muscle weakness, balance/gait problems, prior falls, vision, ADL (Activities of Daily Living) limitations, depression/dementia and medications. But, intervention programs work! Evidence shows 20% to 50% lower fall rates with a systematic program of evaluation, exercise and environment.

We need to create a blameless environment when someone falls. Falls are no one's fault; they just happen. A fall is not a signal to move out of independent living. We need a cultural change so that falls are not "bad" and people feel comfortable reporting the fall so they can get help. "Thanks for reporting this, now we can help you make a positive change...."

Effective exercise interventions include activities that specifically target balance and gait, along with associated risk factors, such as muscle weakness and aerobic

Continued on page 11...



Continued from page 10

endurance. Exercise is performed at a moderate intensity or progresses from low to moderate intensity. Introduce progressively more challenging practice environments.

Integrating wellness into a CCRC

Connie Schmitt, co-presenter
Is Your Wellness Story Communicated?

In our continuing care retirement community, the wellness philosophy crosses all areas. Across the board, everyone is a Wellness Specialist, whether in dining or maintenance or the fitness center. Wellness is an integral part of Associate Orientation. The WE (Workforce Engagement) team includes representatives from each department. Our mission is to “educate and engage all Twin Lakes Associates on the 6 dimensions of wellness while providing quality services to our residents, fellow associates, volunteers and community.”

Often in communities, the activity and wellness departments are separate, and each area produces their own schedules and calendars. But, aren't activity and fitness all wellness? When there were 2 calendars it confused the residents and sent the message that activities aren't part of wellness. It wasn't easy, but we finally put all the activity and wellness options on one calendar. It's much easier for the residents.

Functional strength training

Peter Francis, PhD
Functional Strength Training for an Active Lifestyle

An expanding body of research strongly supports the significant, beneficial effects of strength training on health and function in the elderly. Performance of normal activities of daily living (e.g., climbing stairs, lifting objects, rising from a chair) requires a maximal or near-maximal effort in most sedentary older adults.

The biomechanical considerations for strength training are muscle imbalance, posture and injury prevention. Muscle imbalance occurs when muscles on one side of the joint are strong and tight, and the opposing muscles on the other side are



elongated and weak. Muscle imbalance can be corrected with strength training. Stretch the short, tight muscle, strengthen the elongated, weak muscle and continue to train both muscles equally.

Many people have tight muscle groups. Stretch these muscles and strengthen the opposing groups. For the chest, strengthen the rhomboids and trapezius muscles that pull together the shoulder blades. Tight hip flexor muscles can lead to low-back pain—strengthen the abdominal muscles. Tight hamstring muscles also can lead to low-back pain; equally strengthen the quadriceps and hamstring muscles. For tight calf muscles (plantar flexors), strengthen the dorsiflexor muscles.

Some older individual walk very inefficiently due to atrophy of the gluteus medius muscle. The easiest exercise to strengthen gluteus medius is the one-leg squat, which does not require any equipment.

Many women have a greater vulnerability in the knee joints than men due to their wider hips. The larger angle of force exerted by the quadriceps muscles (Q angle) can cause painful damage to the cartilage (chondromalacia). Strengthen the vastus medialis with exercises that require balance on one foot.

For those who exercise seated in a chair, the only abdominal exercise is isometrics. Have the person push their backs to the

Continued on page 12...



Continued from page 11

chair back. The real thrust of abdominals training is endurance, using many repetitions, which is very different from other muscle groups where intensity is the goal.

Remember that either stretching in the absence of strength training, or strength training in the absence of stretching, will not produce the best results.

Programs for different stages of change

Terry Eckmann, PhD
The Challenge of Change

Help your clients through the steps from Prochaska's 6 stages of change. During Precontemplation/Contemplation, provide exercise prescription pads, gift certificates, educational seminars and literature, demonstrations and high-risk assessments. For those in the Contemplation stage, try an introductory tour and facility trial, personal training interview, decision balance sheet, health event or fit study.

People in the Preparation stage benefit from goal-setting seminars, motivational seminars, a buddy plan, big t-shirt classes, 2-for-one month, and Discover the Connection.

During the Action stage: wellness challenge, healthy weight, fit trip, fit study. For Maintenance, use the Wheel of Fitness, a variety of program options, theme parties, fishbowl drawings, fitness hero of the month or a holiday health package.

Discover the Connection. An ongoing weight management program with a fall kickoff. Break in the summer and for 2 weeks at Christmas. Every Tuesday there is a weight management topic at noon, cost is \$5.

Wheel of Fitness. Individuals sign up for Wheel of Fitness month, pay \$15 and get a t-shirt. There is a wheel with spaces for 8 prizes. They spin the wheel each day they come into the center. Their name goes in a bucket for one of 8 prizes each day. Prizes are given at the end of the month. All prizes are donated.

Big T-shirt Club. Two free weeks of classes aimed at individuals who have been out of fitness classes or have never been to a fitness class. If the leader is good, 50% to 60% will join.

Fit Study. Do a research project for a specific group, such as healthy older adults ages 60 to 70. Provide fitness assessments pre- and post-study and offer 12 weeks of free exercise. Experience shows that 50% to 60% of participants will join.

Relate strength training to daily living

Kay Van Norman, MS
Generational Bias and Negative Stereotypes as Barriers to Physical Activity

Strength training is an excellent example of how to change perceptions of aging and make physical activity personally relevant. Research documents an average strength loss of approximately 1.5% per year from peak strength in early adulthood, resulting in a loss of about 30% by age 60, 45% by age 70 and 60% by age 80. Illustrate to clients how losing half of one's strength would be roughly the equivalent of going about daily tasks while carrying someone of equal weight on his/her back.

Relate strength training research directly to daily functional tasks. For example, "You could benefit from becoming stronger if you...

- ...must use your arms to rise from a chair,
- ...struggle to lift sacks of groceries or something off a shelf,
- ...decline going places because you are concerned about getting up the steps of the bus, plane or tourist site,
- ...are thoroughly exhausted after doing something that used to be easy." ▼

Active Aging 2006

The Active Aging 2006 conference is in Las Vegas on November 15 to 17, with pre-conference activities on November 14. Read the Call for presenters on page 13 to share your knowledge with your colleagues.



Call for presenters: Active Aging 2006

Submit your idea—deadline is February 26, 2006

Download the application form at: www.icaa.ca

You are invited to submit a written presentation idea for the ICAA conference and trade show in November 2006. The ICAA conference provides the latest on industry trends, including in-depth workshops and seminars on topics related to serving the active and inactive older adult. The conference is designed to bring practical and relevant information to the fitness and wellness executive and professional.

The ICAA educational sessions and workshops are 1.5 hours in length. Please ensure the topic you submit WILL work within this time frame.

Active Aging 2006: best practices sessions

Possible lecture topics include, but are not limited to, the following:

- wellness programming (ideas and implementation in 6 dimensions of wellness)
- exercise program design and research
- nutrition, diet, weight management
- marketing and sales
- financial management and budgeting
- facility design and construction
- leadership, communication
- hiring and training of staff and volunteers
- compensating, evaluating and retaining staff and volunteers
- retention, customer service

Active Aging 2006: activity workshops

Possible activity workshop topics include, but are not limited to, the following:

- balance training
- group fitness classes (chair and non-chair)
- walking and/or outdoor activities
- yoga, Pilates, tai chi, Feldenkrais (chair and non-chair)
- aquatics
- posture
- strength training
- post-rehabilitation training

Submission guidelines

- Use one application per workshop. Please do not submit more than 4 sessions.
- Complete the application according to the instructions. Incomplete applications may not be accepted by the selection committee.
- Use the application form at www.icaa.cc
- Save the form to your hard drive, complete, and e-mail to Julie McNeney at jmcneney@icaa.cc
- Applications will only be accepted by e-mail so they can be easily forwarded to the selection committee.

Active Aging 2006

Preconference workshops: Nov. 14, 2006

Conference: Nov. 15 - 17, 2006

Mandalay Bay Convention Center

Las Vegas, Nevada, USA



Appropriate for



Athlete



Active now



Getting started



Needs a little help



Needs ongoing assistance

Use imagery to encourage good posture

By Ken Baldwin, MEd

Improved posture and body alignment are important goals when designing exercise and post-rehabilitation programs for older adults. Not only does proper posture and body alignment provide comfort and ease of movement throughout a person's lifetime, but good postural skills protect and strengthen the body.

Improved posture helps to prevent numerous injuries and the development of chronic problems due to improper physical alignment (Griffin, 1998). Correctly aligned posture prevents injury to joints and muscles. Most important for your senior clients, good posture can help promote better balance and reduce the risk of falls.

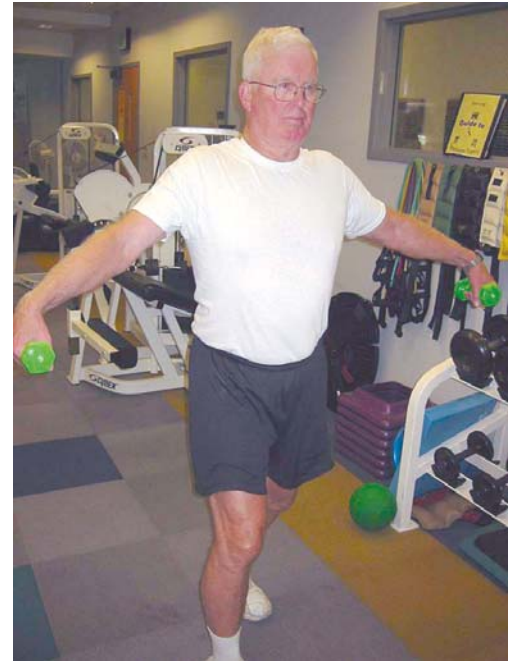
Relaxed but well-aligned posture greatly improves self-esteem and contributes significantly to a sense of well-being because it communicates a message of self-confidence. Moreover, healthy posture—because it promotes a sense of feeling alive and energetic—increases the desire for recreational sports activities. Activities that can be enjoyed alone or shared with others stimulate the general expansion of an older adult's life from boredom to activity and enjoyment.

What is good posture?

A working definition of posture is “the position or attitude of the body or bodily parts that requires a minimum amount of muscular energy to maintain a mechanically efficient function of the joints, skeletal alignment and muscular balance.”

Proper posture is more than just “standing or sitting perfectly straight.” A successful posture program incorporates a holistic approach that educates your older client about proper body alignment while sitting, standing, walking, exercising and performing activities of daily living (ADLs).

Research has shown that in optimal postural alignment, the Line of Gravity (LOG) falls through the center of the joint axes, which evenly distributes body mass and forces



Performed with good posture, the lateral raise trains the middle deltoid and supraspinatus to maintain the proper location of the humerus to the scapula. Keep arms below a 75 degree angle.

throughout the musculoskeletal system (see “Posture checkpoints”). This force distribution allows for a more ideal balance of structures that make up or surround a joint, including ligaments, tendons and muscles (Norkin & Levangie, 1992).

The correct placement of the LOG requires fine tuning on the part of the personal trainer because individuals do not stand in a way that represents the ideal LOG. Observe the client's LOG before, during and after a movement is performed. This way you can identify problem areas and properly guide the client to make the necessary adjustments.

Body alignment corrections can be achieved when you and the client are working as a team to identify the client's needs and determine the best action plan to achieve healthier body alignment. Educating your clients on proper posture allows them to better understand where their optimal posture positions are. On a daily basis they can make the necessary adjustments while at home, work or in the gym.

Continued on page 15...



Glossary

Cue. A verbal direction or hint that assists a person to perform an action.

Ideokinesis. A movement method that uses imagery to train the nervous system to stimulate the right muscles for the intended movement.

Kinesthetic cues. Instructions that create the sense of bodily movement.

LOG (Line of gravity). An imaginary vertical line that passes through the center of gravity.

Posture. Position or attitude of the body that maintains a mechanically efficient function of the joints, skeletal alignment and muscular balance.

Visual imagery. Mental pictures, often created with verbal analogies and common phrases, that evoke images.

Continued from page 14

Teaching procedures

Correcting posture and establishing a more ideal LOG for your client can be achieved by implementing a well-designed exercise prescription and action plan.

- Actively involve clients so they know when the ideal posture is close to being achieved. It helps when there is an established teacher-client relationship with good communication and feedback.
- Implementing an exercise program to change poor alignment and muscular imbalances can be challenging for both the instructor and the client (Nieman, 2003). However, a teaching process that combines observation, education and cueing on exercise and non-exercise techniques can establish healthier alignment and a more productive life for the clients you train (Magill, 2004).
- Correctly position the client's spinal alignment and overall body posture during each phase of an exercise movement.
- Remind clients to consciously apply corrective posture techniques into their daily lives while at home, the office and while performing ADLs so good posture becomes a permanent habit. Carefully designed training sessions can help a client achieve improved posture, but maintaining the improvements requires a conscious effort, practice and patience (Aaberg, 1999).

As reminders to clients to maintain better posture during and outside the training session, a process developed by the National Posture Institute (NPI) called Four Points of Posture™ provides techniques and pointers (cues) to reinforce the foundations of proper body alignment. It consists of a combination of exercise movements and non-exercise cueing techniques that support the client's efforts to improve posture.

Four Points of Posture program

The "cue" is a verbal incentive used during exercise sessions to instruct clients on how to maintain (or reinforce) proper body alignment while exercising. Cueing techniques using words and images provide

Continued on page 16...

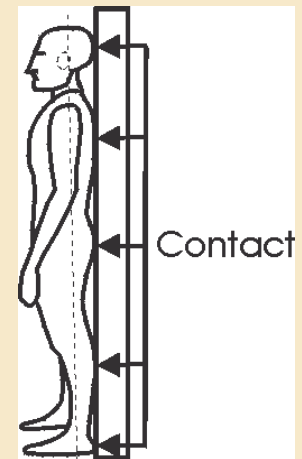
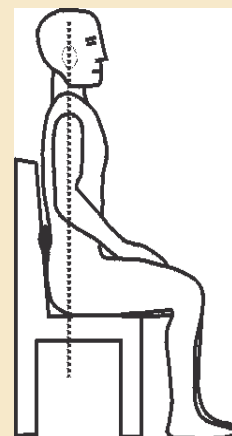


Illustration: Physigraph

Posture checkpoints

- Head position is upright, the chin neither pulled back or jutting out.
- Shoulders are held upright.
- Centered shoulder (not rounded).
- Curvature of lower back is gentle, rather than severely arched.
- Shoulder, elbow and wrist are in a straight line.
- Neutral pelvic position.
- Lower part of the legs are aligned with the thighs.
- Knees are not hyperextended.
- Line of gravity proceeds through the body segments:
 - external auditory meatus
 - acromion process
 - sacrum 2
 - slightly posterior to hip joint
 - anterior to midline of knee joint and posterior to patella
 - anterior to lateral malleolus



www.physigraph.com



Upper body exercises:

standing row
(middle trapezius/rhomboids)

standing row
(latissimus dorsi)

standing trapezius shrug
(upper trapezius, levator scapula)

chest fly
(pectoralis major, anterior deltoid)

lateral raise
(middle deltoid, supraspinatus)

external rotation
(posterior deltoid, infraspinatus, teres minor)

internal rotation
(anterior deltoid, subscapularis, pectoral major, teres major)

biceps curl

triceps extension

Continued from page 15

reminders that help clients achieve a more perfect LOG and assist in the variation or change of a static or dynamic movement pattern or body position (Weinberg & Gould, 2003).

Fairweather and Sidaway (1993) studied the effects of cueing during exercise sessions with important results. They conducted 2 experiments examining the effectiveness of ideokinetic imagery (visual imagery methods that incorporate kinesthetic cues) and flexibility combined with abdominal strength training to improve exaggerated lordotic and kyphotic spinal angles. Their findings showed that after 8 weeks, study participants who used the visual imagery and kinesthetic cues were able to improve their postural alignment and reported a complete cessation of low-back pain. The study concluded that the use of visual imagery can be an inexpensive and noninvasive technique to improve poor posture and reduce low-back pain.

The Four Points of Posture are visual images combined with basic postural awareness. Once the client has learned the points, trainers can use them as cueing techniques or reminders to position a client in the most posture-correct way before and during exercise sessions as well as when they are sitting, standing, walking or performing other daily activities. Such cues enable clients to integrate postural alignment techniques into their lives as a whole.

Plus, cueing techniques help break bad habits. For example, for a client with rounded shoulders who is about to perform a dumbbell biceps curl, you can cue the client to stand straighter and make the shoulders more level before executing the movement. The cue helps break the habit, rather than skipping over the problem and inadvertently reinforcing the bad habit.

Continued on page 17...

Four Points of Posture			
Point	Cue	Image	Client action
1	“Stand tall.”	Visualize the vertebral column is lengthening and growing taller.	Lengthen the vertebral column (reduces compression on discs).
2	“Hold chest and shoulders high.”	Visualize the chest opening up while not allowing the shoulders to round forward.	Raise the shoulders to a level position, creating a 90 degree angle.
3	“Retract scapula.”	Visualize holding a pencil vertically between the scapulas (shoulder blades).	Retract the shoulder blades (contracting the middle trapezius and rhomboids).
4	“Contract abdominal muscles.”	Visualize drawing the belly button toward the spine and isometrically contracting the core muscle(s).	After the 3 points, clients may lean backwards. Contracting the abdominals usually brings clients forward and realigns the pelvis.



Core exercises:

trunk flexion
(rectus abdominis)

trunk extension
(erector spinae)

trunk rotation
(internal and external
obliques)

Lower body exercises:

lunges

squats

Continued from page 16

Cueing techniques that use imagery can support clients in their attempts to make significant posture changes and reduce, if not eliminate, the occurrence of muscular imbalances that cause joint, muscle and back pain.

Exercise movements

By incorporating the Four Points of Posture, the client is able to maintain proper body alignment during the entire phase of each movement, from the preparation to ending phase. When a client reverts to poor alignment and performs an exercise movement incorrectly, cue the client on the appropriate adjustments to re-establish proper alignment and LOG before performing another repetition of the exercise.

Make posture awareness a daily routine

Routines can focus concentration and attention on the task at hand, especially the enhancement of posture and body alignment. Trainers can establish a self-monitoring routine so that clients can check themselves for correct postural alignment throughout their daily activities. Postural training is learned in the training session, but practice really starts when one leaves the training facility.

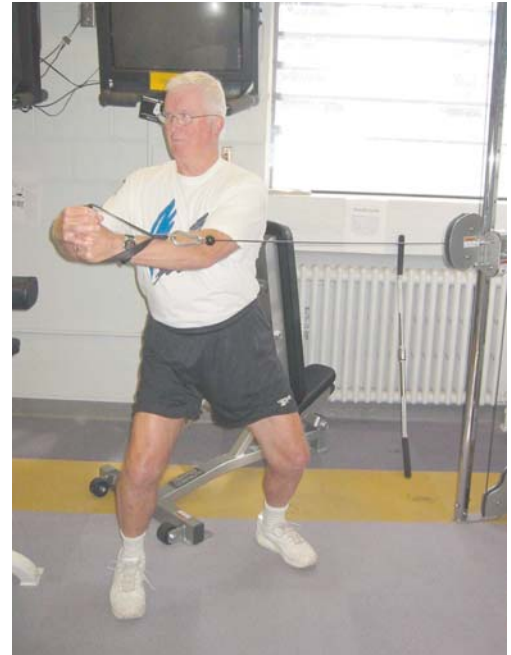
By following a prescribed schedule, they can slowly integrate the NPI Four Points of Posture program into their everyday lifestyle over the course of 4 weeks. For example:

- Week 1: Follow Four Points 3 times a day at breakfast, lunch and dinner
- Week 2: Increase to 6 times per day at each meal and in between each meal
- Week 3: Once every hour of the day
- Week 4: Once every 30 minutes of the day

Good posture for quality of life

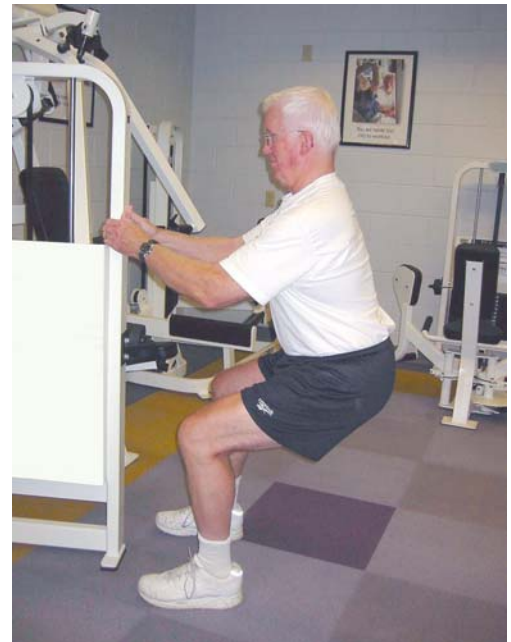
A successful corrective exercise program, presented through a step-by-step educational process, can help your clients achieve the goals of better posture and

Continued on page 18...



Model: Dick Dilley, Professor Emeritus, Purdue University

Rotation. This is an example of rotation performed with good posture.



Photography location: A.H. Ismail Center for Health, Exercise, and Nutrition at Purdue University

Squat. Start by bending knees slightly and continue to maintain good posture during the movement. The client may not want to go lower than a 100 degree angle being formed at the knee joint.



Continued from page 17

healthier body alignment. You play a critical role as a posture and body-alignment educator in the life of your client. A well-tuned postural alignment can enrich your older client's life at many significant levels.

Achieving this goal is dependent on your ability to accurately assess, educate and practice postural alignment exercises. When you approach this process with adult learning and teaching techniques, you will greatly increase your capacity to successfully meet your senior client's posture and body alignment goals. ▼

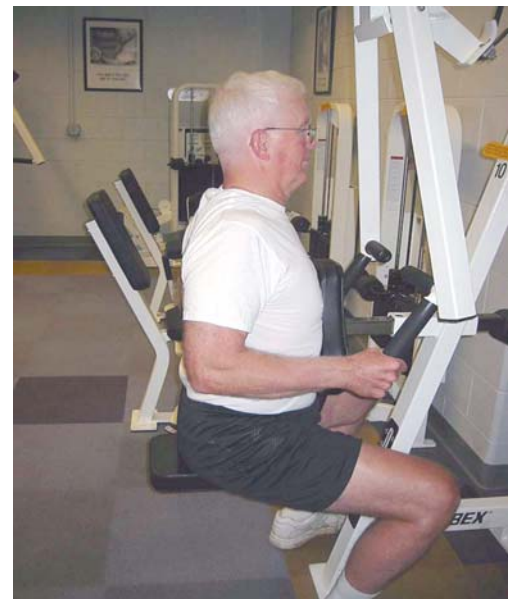
Ken Baldwin, MEd, is acting Assistant Director of the A.H. Ismail Center for Health, Exercise, and Nutrition and Program Coordinator for the Personal Fitness Training Undergraduate Degree Concentration at Purdue University. He is the founder and president of the National Posture Institute (www.npionline.org) and former chair of the Senior Fitness Subcommittee for the Massachusetts's Governor's Committee on Physical Fitness and Sports. He's been awarded Boston's Best Personal Trainer 3 times and received the IDEA Personal Trainer of the Year Award. Ken can be reached at kbaldwin@cla.purdue.edu

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Leg extension. Caution the client not to use the back during the movement, to maintain good posture and to extend the legs 20 degrees short of full extension.



Seated row. Retract the shoulder blades and form a 90 degree between the wrist, elbow and shoulder joints.



Physical activity = daily activities that increase energy expenditure, such as golf, gardening, walking, raking leaves, housework, washing car

Exercise = physical activity with the intention of developing physical fitness, such as strength, cardiovascular or flexibility exercise, challenging walking, pre- or post-rehabilitation exercise

Physical reserve = margin of safety between independent living and frailty

Functional levels

Adults over 50 years represent a wide range of abilities and attitudes. Functional levels are more important than chronological age when planning wellness and fitness activities. The functional levels used by ICAA are a practical way to categorize your participants and develop their programs. Look for these icons in *Functional U* and ICAA's Age-Friendly Facility Locator.



Athlete

Fitness: Exercises or participates in sports activity almost every day or works at a physically demanding job.

Goals: To maintain or improve fitness level and succeed in sports.

Needs: Exercise that provides conditioning for improving performance in competition or in strenuous vocational and/or recreational activities.

Program: General conditioning in muscular strength, endurance and flexibility, agility and cardiovascular endurance. Sport or activity specific conditioning.



Active now

Fitness: Exercises at least twice a week and engages in physical activity most days of the week for health and enjoyment.

Goals: To maintain or improve fitness level and manage weight.

Needs: Exercise that builds physical reserves and helps maintain the level of fitness to live an active, independent lifestyle.

Program: Concentrate on muscular strength, endurance and flexibility, joint range of motion, balance, coordination, agility and cardiovascular endurance.



Getting started

Fitness: Engages in some physical activity and can perform activities of daily living, but may have functional limitations.

Goals: To live independently, manage weight and improve conditions such as arthritis or diabetes.

Needs: Exercise that helps improve physical function and develops physical reserve to prevent decline.

Program: Focus on increasing and building reserve in muscular strength, endurance and flexibility, joint range of motion, balance, coordination and cardiovascular endurance.



Needs a little help

Fitness: Engages in limited physical activity. May have medical conditions and movement limitations.

Goals: To regain strength and balance, improve function and mobility and improve medical conditions.

Needs: Exercise to improve strength, range of motion, balance and coordination that helps instrumental activities of daily living (shopping, housework).

Program: Improve hand strength and agility, arm strength, shoulder and hip range of motion, quadriceps and shin muscles strength, and ankle strength and range of motion.



Needs on-going assistance

Fitness: Does not engage in physical activity.

Goals: Improve ability to perform activities of daily living and manage illness.

Needs: Movement that helps maintain or improve physical function for basic self-care, including self-feeding, bathing, dressing, toileting, transferring and walking.

Program: Concentrate on activities that improve strength, range of motion, balance and coordination.

Adapted from functional levels developed by Waneen Spirduso, EdD (*Physical Dimensions of Aging*, Human Kinetics, 2005).



Are you hurting?

If you have arthritis, low-back pain, osteoporosis, fibromyalgia or another condition, then you may experience chronic pain. That's the pain that lasts after an injury is healed, or for 3 months or more. Your doctor has probably already told you about a variety of treatments. The treatment that can be highly effective is exercise.

While exercise may be the last thing you want to do when you hurt, it can also be the thing that makes you feel better. Exercise can:

- Keep joints moving, which helps prevent them from feeling "stiff."
- Strengthen the muscles around the joints. Stronger muscles do more of the work so there is less stress on the joints.
- Increase flexibility by stretching sore muscles.
- Make it easier to perform your daily activities, because stronger muscles and more flexibility improve your ability to function.
- Improve sleep. When you exercise, your chances of sleeping through the night are much better.
- Increase blood flow, which aids healing (for example, a fracture from osteoporosis) and overall cardiovascular health.
- Control body weight, which reduces stress on the joints.
- Encourage the release of endorphins, the chemicals that make you feel better.
- Speed healing. For example, exercise can make low-back pain go away faster.

Exercise for pain relief

Start slow and easy. First, work on your posture. Just straightening up can take some effort, but when your joints and muscles are in alignment, it relieves stress on the body.

Learn techniques for lifting, sitting and walking that also reduce pain. Ask someone at the wellness center, a personal trainer or a therapist to help you.

Then, start moving. Simple stretches and range of motion exercises can help you start. When you move your hand and arm in a big circle, that's range of motion.

Building muscle strength is an important part of your exercise program. Your goal is to strengthen weaker muscles. For example if your back hurts, then strengthen the muscles on the opposite side of the body, those in the abdominal area. For arthritis of the knee, strengthen the muscles of the leg to take the pressure off of the knee joint.

Cycling, swimming and walking are low-impact activities that start you moving. Try to do one of these for a short time, just 5 minutes a day will help. Then add on 5 more minutes and another 5 minutes until you reach about 30 minutes most days of the week.

It's time to get started! Your first step should be visiting a physician, physical therapist or a personal trainer. Each of these people can tell what *not* to do, and also advise you on the exercises that will work for your individual situation. The potential for pain relief is great!

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C o m m e n t

Active aging goes beyond limitations

We are all subject to aches and pains, the signals our bodies use to tell us about a health problem. But chronic pain—lasting 3 to 6 months or after an injury is healed—is a different matter.

When you consider that 15.7 million people over age 65 (and 18.5 million of those ages 45 to 64) have doctor-diagnosed arthritis, that 10 million people probably already have osteoporosis and that low-back pain is most frequently seen in people ages 45 to 60 years, then it's safe to assume that many older people live with chronic pain.

Live with? As with many areas, attitude has an influence over whether the person or the pain dictates quality of life. A new report from the Cache County Memory Study found that most older adults were healthy long into their life spans. About half of the people were living with at least one chronic condition, and they nonetheless reported at least fair health and the ability to perform most activities of daily living [*ICAA Research Review*, 6(2)].

Isn't that the secret to active living with chronic pain? Recognizing the pain, but living life to the fullest so there is the least restriction of everyday activities. The good news is that exercise and physical activity are antidotes to pain.

When a person feels pain, exercise may seem like the cure that is worse than the disease. Older folks who already are not predisposed to exercise may be even more reluctant to move when they are hurting. That's where you, as their advocate, can inform and encourage them about the benefits of even a small amount of activity.

In between your discussions with clients and residents, how about standing up and leaning backward to counteract the low-back pain from professional sitting?

Pat Ryan, Editor
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