

# 10 minutes to stronger bones

Conventional medicine tells us that the only way to avoid bone loss is with a lengthy regime of heavy weight-lifting and 'strike' exercises, but yoga expert Charlotte Watts begs to differ



**Y**oga is considered the quintessential exercise for flexibility, but not many people know that it's also a potent bone-builder. Lots of people begin yoga to help with back pain, and it's no coincidence that they also see improvements in bone health, especially alongside dietary changes like less sugar and acid-forming foods and more vegetable intakes.

The combination of postural improvement, muscle strength and better coordination adds up to improved overall musculoskeletal health. More balanced breathing patterns also improve circulation to feed oxygen and nutrients to bone cells.

### Bone as living tissue

Much of bone health comes down to its density, which naturally decreases with age, so increasing the risk of debilitating fractures. We reach maximum bone density at around 30 years of age, and it declines rapidly from 40 onwards. The International Osteoporosis Foundation reports that, worldwide, osteoporosis affects around 200 million women. It causes more than 8.9 million osteoporotic fractures annually—affecting one in three women and one in five men aged over 50.<sup>1</sup>

For women, the natural transition of the menopause can compound bone loss, as falling hormone levels can result in up to a 20 per cent loss in the first five to seven postmenopausal years.

Bone is referred to as a 'rigid organ'—its dense connective tissue is supportive, but also constantly fluctuating as it responds to bodily needs. Minerals are stored in bone, as well as fat in bone marrow; white and red blood cells are created; and buffer systems to control the body's pH are continually breaking down and renewing the bone matrix (support structure).

When this buildup-to-breakdown balance is compromised, bone loss beyond that of natural ageing, or osteopenia, and ultimately full-blown osteoporosis occur, often only diagnosed after a fracture.

In a small preliminary study in 2009, Loren M. Fishman, MD, noted: "More than 200,000,000 people suffer from osteoporosis or osteopenia worldwide. An innocuous and inexpensive treatment would be welcome."<sup>2</sup> As much of medical treatment for osteoporosis involves bisphosphonates,

known to irritate the digestive system, yoga is an obvious solution. It has been practised by senior citizens (in its present form) for around a century, with many modifications and levels available to teachers.

Fishman's study, although small, showed interesting results. In it, 18 people with osteoporosis or osteopenia, and an average age of 68, completed the two-year protocol, including seven patients who were the controls. Eleven patients learned a yoga sequence including the Triangle pose, the Downward-Facing Dog and the Bridge pose (see pages 36 and 39). Each posture was held for 20–30 seconds and the routine took about 10 minutes.

This fits in with previous research findings that about 10 seconds of weight-bearing stimulation is enough to trigger new bone growth. Two years later, Dr Fishman reported that, while the controls not practising yoga either lost or maintained bone, around 85 per cent of the yoga practitioners gained bone density at both the spine and hip.

This correlates with another 2009 study in which 19 women, aged 50–60, undertook a 12-week course of yoga, 3 days a week.

**“When yoga poses are held, muscles are lengthened and this pulls on bone, creating the tension that leads to bone growth”**

Evaluation of bone formation markers showed that "weight-bearing yoga training had a positive effect on bone by slowing down bone resorption"<sup>3</sup> An improvement in quality of life was also demonstrated by increases in physical functioning, general health and vitality, as well as decreased bodily pain.

As Dr Fishman also noted, "Yoga has been shown to reduce back pain, arthritis and anxiety, and to improve gait [and] neural plasticity associated with motor learning, all capacities that mitigate against the falls that produce osteoporotic fractures."<sup>4</sup>

### The inflammation connection

A sometimes overlooked factor in osteoporosis is inflammation. This protective response is heightened by stress and sugar, and interferes with bone mass repair. Stress also diminishes beneficial gut bacteria (probiotics), so upsetting immune modulation and provoking tendencies toward chronic inflammation. Many studies have demonstrated the positive effects of regular yoga practice on lowering

the stress hormone cortisol and associated inflammatory markers such as cytokines like interleukin (IL)-6.<sup>5</sup>

### Weight-bearing without joint wear

Yoga targets bones in ways that other exercise programmes may not. Activities like weight-training, hiking, jogging, tennis and dancing all create force on the bones as we move against gravity. These weight-bearing actions use the feet and legs, and bone adapts to the impact of the weight load.

Yoga postures (when practised with care and proper alignment) cause less damage to cartilage and joints; when poses are held, muscles are lengthened and this pulls on bone, creating the tension that leads to bone growth. As Fishman said in an interview for *Yoga Journal*, "By putting tremendous pressure on the bones without harming the joints, yoga may be the answer to osteoporosis."<sup>6</sup>

This can be seen in a pose like Warrior 2 (see page 38). Says Fishman, "... by bending the front knee to 90 degrees, you do more than simply bear weight in the front leg; you magnify the force on the femur [thigh] bone.

... Because you're holding your arms out away from your body, you're putting a lot more stress on the head of your humerus [upper arm bone] than you would if they were hanging at your sides."<sup>7</sup>

### Overall skeletal health

To assess the health of our skeleton, it is key to observe the shape of our whole musculoskeletal structure. For instance, hyperkyphosis, or a hunched back, is commonly seen in the elderly and is now more prevalent in younger generations because of sedentary chair-sitting, computer and smartphone habits. With little opposing actions to open the chest and lift up the front spine, the muscles reset themselves to collapse in the front body while overstretching in the back. Helping to coax the thoracic spine (upper back) and neck towards their more natural curves helps nurture a supportive structure, reducing compression on spinal discs.<sup>8</sup> This has far-reaching consequences for standing, reaching, and prevention of falls and fractures in the elderly.

As one 2011 review of the literature concluded: "Yoga has the potential to decrease fracture risk in a geriatric population via several mechanisms, including improving balance, reducing fall risk and fear of falls,



improving functioning, reducing hyperkyphosis, and improving bone turnover.”<sup>4</sup>

### Not just exercise

Yoga is an ancient system of health, including emotional and spiritual wellbeing. The physical aspects so well known today were only introduced to support the ultimate goal of concentration, meditation and meeting of the individual’s consciousness with the universal consciousness.

These deeper aspects invite more commitment to the physical practice, and the accompanying focus on breathing, mindfulness and attention to other aspects, such as compassion, plant-based diets and community, are all shown to support bone health through contributory factors like reducing stress and lowering inflammation.

### A word of caution

Where bone loss has occurred, some cautions need to be applied: forward bends, for instance, compress the vertebrae, increasing the risk of fracture in those with osteoporosis. But a modification using a less intense angle can strengthen bone and the muscles supporting it without exerting further strain or wear (see the Downward-Facing Dog variation, below right).

Checking the suitability of each pose for your individual needs with a yoga therapist, physiotherapist, osteopath or other qualified professional is advisable.

### REFERENCES

- 1 International Osteoporosis Foundation; [www.iofbonehealth.org/facts-statistics](http://www.iofbonehealth.org/facts-statistics)
- 2 Top Geriatr Rehabil, 2009; 25: 244–50
- 3 J Med Assoc Thai, 2009; 92 Suppl 5: S102–8
- 4 J Altern Complement Med, 2012; 18: 662–7; India n J Psychiatry, 2013; 55 (Suppl 3): S405–8; Psychosom Med, 2010; 72: 113–21
- 5 Guthrie C. ‘Stay Good to the Bone with Yoga.’ *Yoga Journal*, 1 July 2011; [www.yogajournal.com/article/health/good-bone/](http://www.yogajournal.com/article/health/good-bone/)
- 6 J Orthop Sports Phys Ther, 2010; 40: 352–60
- 7 Top Geriatr Rehabil, 2011; 27: 116–23

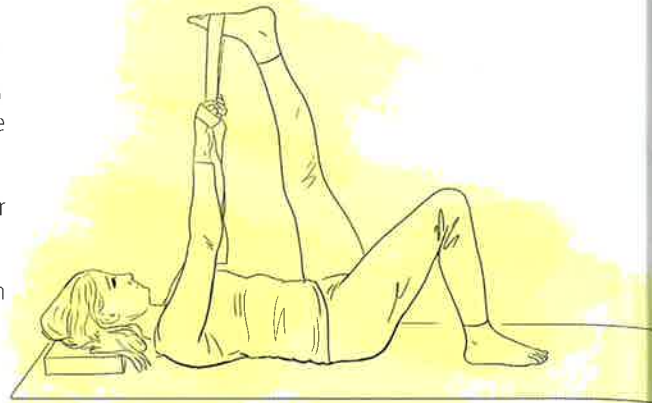
## Poses for bone-loss prevention

A combination of posture-opening, weight-bearing and actively relaxing postures makes a rounded, balanced practice for the skeleton. To create the ease that avoids stress, do these poses with mindful attention, a soft jaw and a free-flowing spacious breath. This will allow the nervous system to regulate without agitation. When you feel a muscle constrict and/or lengthen, breathe into the process, allowing your full exhalations to let the nervous system know you are practising with awareness and protection.

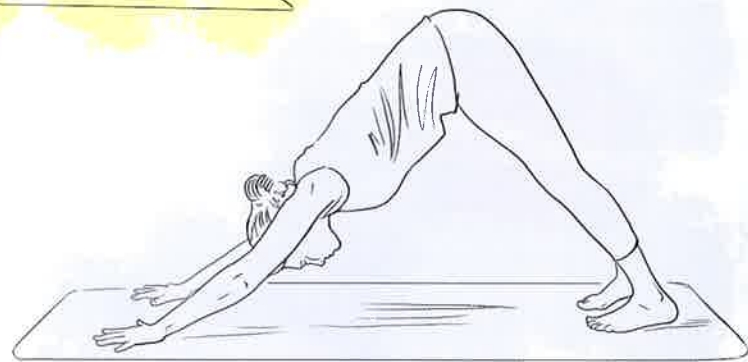
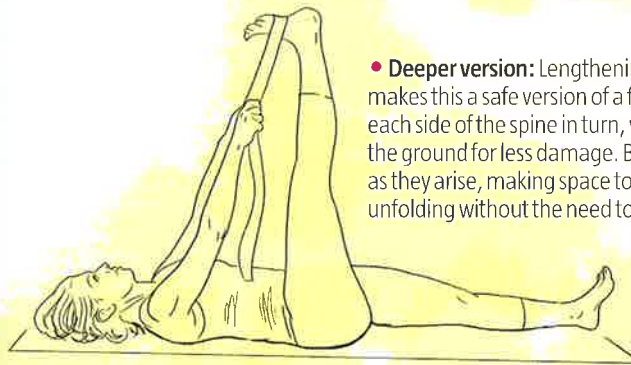
### Pose 1

## Supta Padangusthasana 1 Reclining Hand-to-Big-Toe Pose

- **Gentle version:** The lower leg remains bent to lessen the pull on the lower back and allow more progressive opening of the hamstrings. Start with this pose, whatever your level, to allow the hamstrings time to open up with the flow of your breath. Place a yoga belt around the foot just in front of the heel, holding each end with straight arms and soft shoulders. Support your head with a block or blanket to avoid compression at the back of the neck.



- **Deeper version:** Lengthening the lower leg along the floor makes this a safe version of a forward bend and lengthens each side of the spine in turn, while the spine is supported by the ground for less damage. Breathe fully into all sensations as they arise, making space to open up and feel the pose unfolding without the need to react.



### Pose 2

## Adho Mukha Svanasana (Downward-Facing Dog)

- **Full version:** This combination of a forward-bending inversion pose can strengthen the spine when the chest is open enough to allow a full stretch up and back from the hands connecting to the ground. Rooting into the base of the index finger and drawing back the thighs to lengthen the spine creates space up through the shoulder joints.

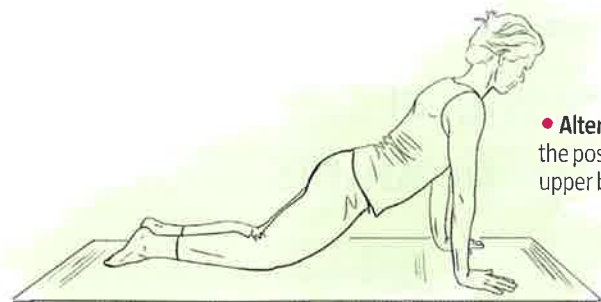
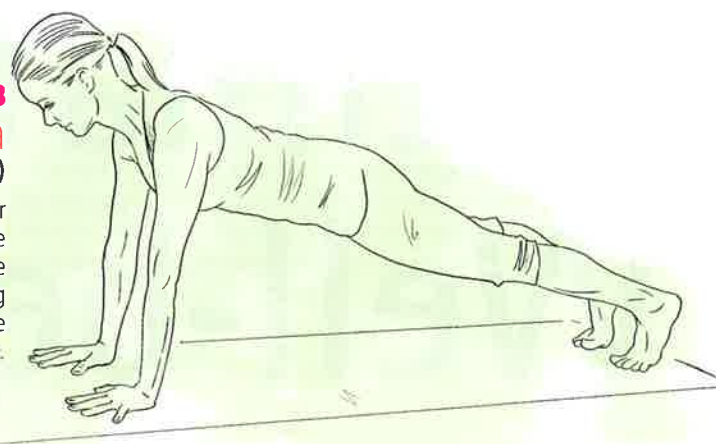
- **Alternative:** Where bone loss or hunching of the upper back does not allow complete opening of the front body in this pose, a variation done against a wall can lengthen the spine with less force needed. Keep the ears between the arms for a good neck position.





### Pose 3 Uttihita Chaturanga Dandasana (Plank Pose)

• **Full version:** This pose helps strengthen the support between the upper and lower body through strong engagement of the abdominal muscles, while drawing the breastbone into the body to prevent it just hanging off the shoulders. Holding the whole of the body sideways off the ground is also strongly weight-bearing. Strong roots into the feet allow lengthening up to the neck and allows it to sit above the shoulders as when standing—great for neck bone health.



• **Alternative:** Drop onto the knees for a 'half' version of the pose, where you're only supporting the weight of the upper body.

### Pose 4 Trikonasana (Triangle Pose)

• **Full version:** Angle the right foot to around 45 degrees while keeping the left foot parallel to the sides of your mat (or at 90 degrees). Keeping the right front heel, knee and sitting bone in alignment lets the spine lengthen as you reach out sideways without pulling on the lower back. Place your right hand on your shin between the ankle and knee, not so far down that you cannot open the chest. Look forward to breathe length into the spine as you lift up through the legs. Repeat on the left side.

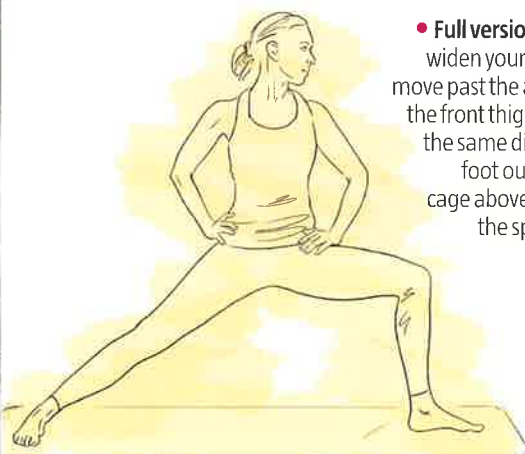
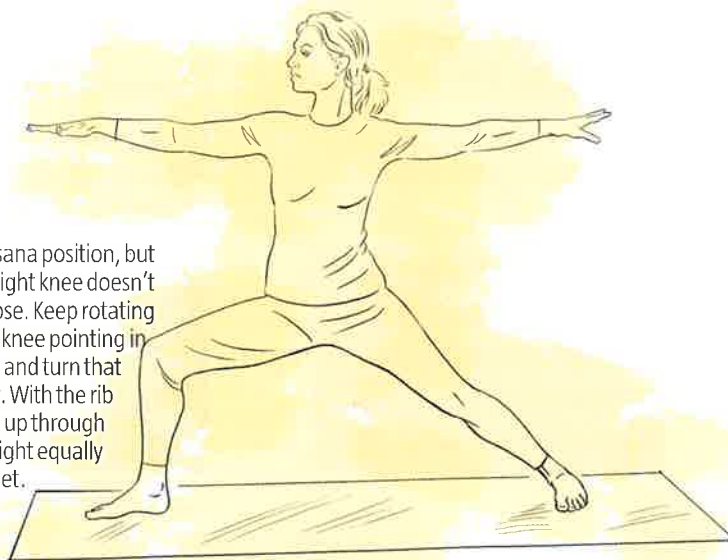
• **Modification:** Reaching the bottom arm out onto a chair raises the position of the upper body, allowing greater chest-opening and spine-lengthening, which may be difficult when attempting the full version.



### Pose 5 Virabhadrasana 2 (Warrior 2)

• **Full version:** Return to the first Trikonasana position, but widen your stride if you need to so your right knee doesn't move past the ankle as you bend into this pose. Keep rotating the front thigh bone outwards to keep the knee pointing in the same direction as the toes for safety, and turn that foot out a little more if this is difficult. With the rib cage above the pelvis, you can lengthen up through the spine while balancing your weight equally between your feet.

• **Modification:** Drop down just to where your knees and hips feel safe, and place your hands on hips to focus on the legs first.



### Pose 6 Adho Mukha Svanasana (Downward-Facing Dog) or modification as before

• These poses can always be used as a 'bridge' between other postures as they neutralize the spine.



### Pose 7 Setu Bandha Sarvangasana (Bridge Pose)

• **Full version:** With the feet a hip-width's apart, bring them close enough in towards your bottom that you can press up to lift the pelvis off the ground without feeling knee strain. Keeping your knees just as wide as your feet and the base of your big toe rooted to the ground ensures you can push up while keeping the waist long and the chest open.

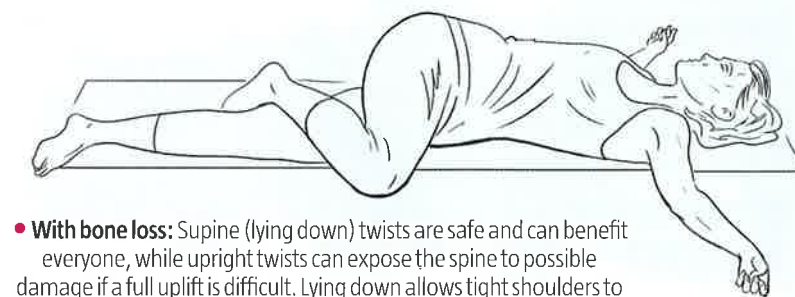
• **Modification:** If you have knee issues, place a bolster or stack of blankets under your pelvis to ease any pressure on them. Although this removes the weight-bearing aspect, it then becomes a supported back arch to encourage chest-opening and a long neck for a healthy spine.



### Pose 8 Parivrtta Sukhasana or Supta Matsyendrasana (Seated or Supine Twist)

• **With a healthy spine:** Seated twists need continual lifting of the spine to avoid disc compression as gravity pushes them downwards. The uplift is more important than how far you twist. Drawing round from the belly, then chest, then neck allows a smooth spiralling movement rather than a sudden torque of the body at different sites.

• **With bone loss:** Supine (lying down) twists are safe and can benefit everyone, while upright twists can expose the spine to possible damage if a full uplift is difficult. Lying down allows tight shoulders to release and body weight to progressively deepen the pose.



### Pose 9 Savasana (Corpse Pose) with knee support

• Always finish your practice with Savasana. Its deep meditative relaxation rests the muscles and tissues that were stretched, compressed, twisted and moved. Placing a bolster, cushions or a rolled blanket under your knees softens the lower back, and allows thigh and psoas (located on either side of the lumbar spine) muscles to relax more easily. These muscles hold us upright and benefit from relaxation to ensure they are able to fully support your bones.



Charlotte Watts is a yoga teacher, nutritional therapist and the author of *The De-Stress Effect* (Hay House UK, 2015), £12.99