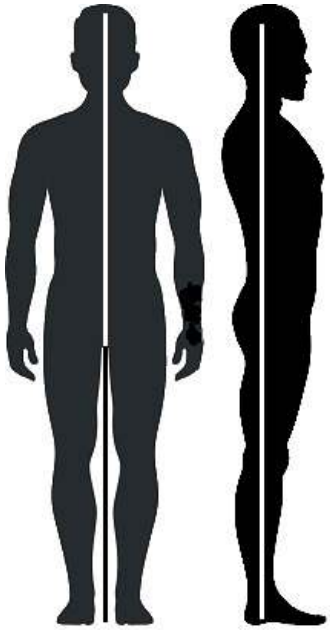
Name: …….. M ☐ F ☐ Age ……..

Organisation: …….. Division ……

Work address for return of workbook: ……

Email address to receive occasional newsletter: ……..



Musculo-skeletal Health Seminar

and Risk Assessment

John Miller

CrookBackClinic.com Miller Health Global Back Care

Introduction

The Musculo-skeletal Health Seminar is, for all intents and purposes a physical fitness (strength and flexibility) program designed to

- provide you with information about the most prominent causes of musculo-skeletal dysfunction
- audit your personal risk of musculo-skeletal dysfunction
- teach you some of the key exercises you need to do to keep your skeleton in good alignment and your muscles strong enough to do every day tasks without breaking down.

It's essential that you know how strong and flexible you are. Then you'll known whether you are at risk of joint and muscles pain. If you are already in pain the seminar will provide you with clues as to why you're in pain and what you can do about it

For your employer it's important they know how fit and healthy you are because they're paying your workers compensation premiums. They need to know the risk and manage the risk.

By doing the exercises outlined in this book you can expect a dramatic improvement in the status of your musculo-skeletal health

Global BACK CARE

The exercises have been developed as part of Miller Health's Global Back Care program.

Pro-Active Rehab

There's also more information including the **Clinical Diagnostic Assessment** in the musculo-skeletal section of the Pro-Active Rehab website.

In the meantime stay tuned, highly tuned and remember, it's a big ask expecting to get better by having someone do some thing to you: sooner or later you have to do something to yourself.

John Miller

Miller Health Pty Ltd
March_2018
7 Salvado Place, Stirling ACT 2611
john.miller@millerhealth.com.au
(02) 6288 7703

Contents

It's a big ask expecting to be in good musculo-skeletal health without having a regular and systematic strength and flexibility training program.

John Miller

1. Personally-generated musculo-skeletal dysfunction

Musculo-skeletal dysfunction has reached epidemic proportions in our community. By far and away the greatest proportion of this dysfunction is personally generated by people who have failed to keep their skeleton in good alignment and the muscles that support it strong enough to do every tasks without breaking down.

The good news is that if the dysfunction has been personally-generated, there's a good chance it can be personally ungenerated.

The number of people with crook backs, stiff necks, frozen shoulders, bung hips, game legs, dicky knees and limp wrists is legion. The honour roll of people with artificial hips and knees is growing at an exponential rate. The public cost of poor skeletal alignment and a lack of individual strength and flexibility is horrendous.

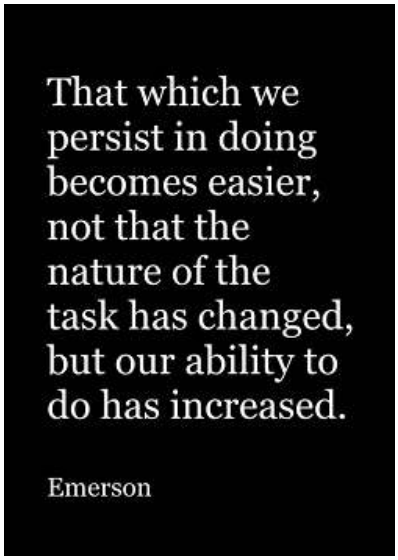
The most frequently prescribed treatment is either nothing (and hope the pain goes away) an anti-inflammatory tablet and/or a passive therapeutic crunch or rub down.

At worst the treatment leads on to mutilation when a cartilage or disc is given a shave or a hip or knee joint replaced (without any prior attempt to remediate a problem through strength and flexibility exercise). Treatment no doubt effective in relieving pain and making a new start, but not aimed at restoring the body to its designed state of function.

Passive therapeutic treatment frequently leads to more treatment, not less. It's treatment based on poor diagnosis of the cause of the dysfunction. It's treatment which frequently leads to more dysfunction, not less and to greater rather than reduced dependence on the medical system. For instance, osteoarthritis is, in many instances, an inflammation of the bone caused by two bones that are out of alignment rubbing against each other. The pain is telling us to fix the alignment problem. Arthritis is not caused by a lack of Celebrex!

If you are suffering from musculo-skeletal pain, the good news is that with the right amount of the right exercise there's a better than even chance that poor function can be restored to good and leave you pain free.

I estimate that the cause of most workplace musculo-skeletal 'injuries' is more related to personally-generated dysfunction than the incident that usually gets the blame. And that in turn is related to motion starvation. We don't do enough of the exercises that will keep us in good musculo-skeletal health.



2. Safety Information – the fine print

As a graduate physical educator and fitness practitioner I'm qualified to provide you with advice and exercises that are safe for normal, healthy human beings. Done properly you can expect an improvement in your Musculo-skeletal health.

However, because I have no idea of your current physical condition I need to provide you with some safety advice and request that you look after yourself during the session.

Tick the boxes to signify that you have read, understood and are happy to comply with the safety information below.

1. There is a risk that you could injure yourself during this session. Whilst it is unlikely, you may strain a muscle, tendon or a ligament, particularly if you haven't done any strength or flexibility exercises for a long time. This is a risk you need to be aware of and one which I cannot shoulder. ☐
2. You may be stiff tomorrow, particularly if you haven't done any squats, situps or pressups for years. This stiffness is normal. ☐
4. You may be a bit tender for a day or two if you stretch – even gently – muscles that have been tight for years. This is normal ☐
5. If there is conjecture about the safety of some of the exercises I recommend, I will point out those safety concerns to you. ☐
6. If you don't want to do an exercise, don't do it. ☐
7. If you think you shouldn't do an exercise, don't do it. ☐
8. If it hurts while doing an exercise, stop doing it. ☐
9. If another therapist has said 'Don't do that exercise', don't do it. I'm not going to argue with other therapists in their absence. ☐
10. Look after yourself. ☐

Please sign on the dotted line to confirm that you've read this advice and are happy to participate in the exercise part of this session. …….. Date ..../..../….

3. Health Climate Survey

The three major body system dysfunctions of our time are metabolic dysfunction, musculo-skeletal dysfunction and mental health dysfunction. The Health Climate Survey will provide you with an all round view of your current health status. To complete the survey, circle the number appropriate to the degree to which you experience the symptoms on the left hand side of the page. The greater the symptom, the higher the score. If you're on medication score ten.

	None		Hardly any			A fair bit				A lot
1. Headaches (including migraines)	0	1	2	3	4	5	6	7	8	9	10
2. Lack energy and vitality	0	1	2	3	4	5	6	7	8	9	10
3. Furry tongue, thrush, jock itch, tinea...	0	1	2	3	4	5	6	7	8	9	10
4. Poor sleep (Score 10 if you frequently use tablets)	0	1	2	3	4	5	6	7	8	9	10
5. Snoring, sleep apnoea (Score 10 if using mask)	0	1	2	3	4	5	6	7	8	9	10
6. Musculo-skeletal pain, back, neck, shoulders, hips, RSI …	0	1	2	3	4	5	6	7	8	9	10
7. Frequent colds, flu and sinus	0	1	2	3	4	5	6	7	8	9	10
8. Reflux, unsettled stomach (Score 10 on tablets)	0	1	2	3	4	5	6	7	8	9	10
9. Overweight (1 pt for every 2kg over ideal weight)	0	1	2	3	4	5	6	7	8	9	10
10. Irritable bowel, constipation, trots...	0	1	2	3	4	5	6	7	8	9	10
11. Shortness of breath from asthma	0	1	2	3	4	5	6	7	8	9	10
12. Low level of fitness (Your estimate)	0	1	2	3	4	5	6	7	8	9	10
13. Chest pain, palpitations	0	1	2	3	4	5	6	7	8	9	10
14. Itchy, rashes, skin outbreaks, psoriasis...	0	1	2	3	4	5	6	7	8	9	10
15. Mouth ulcers, cold sores ...	0	1	2	3	4	5	6	7	8	9	10
16. Elevated blood pressure (Score 10 if on tablets)	0	1	2	3	4	5	6	7	8	9	10
17. Elevated blood cholesterol? (10 if on tablets)	0	1	2	3	4	5	6	7	8	9	10
18. Elevated blood glucose? (Score 10 if on tablets)	0	1	2	3	4	5	6	7	8	9	10
19. Shakes, nervous tics and mannerisms	0	1	2	3	4	5	6	7	8	9	10
20. Grinding teeth	0	1	2	3	4	5	6	7	8	9	10
21. Alcohol intake (2 points per drink/day)	0	1	2	3	4	5	6	7	8	9	10
22. Smoking behaviour (1 point/cigarette/day)	0	1	2	3	4	5	6	7	8	9	10
23. Caffeine intake (1 point per cup)	0	1	2	3	4	5	6	7	8	9	10
24. Anxious about life, insecure, apprehensive about your future	0	1	2	3	4	5	6	7	8	9	10
25. Are you depressed? (Score 10 if on medication)	0	1	2	3	4	5	6	7	8	9	10
26. Are you in the wrong job?	0	1	2	3	4	5	6	7	8	9	10
27. Do you feel under appreciated at work?	0	1	2	3	4	5	6	7	8	9	10
28. Do you have a poor work/life balance?	0	1	2	3	4	5	6	7	8	9	10
29. Unhappy with your family life?	0	1	2	3	4	5	6	7	8	9	10
30. Unhappy with your financial status?	0	1	2	3	4	5	6	7	8	9	10

The score of a normal, fit and healthy human being is less than ..... **TOTAL**

4. Joint Condition Assessment

Dreadful Good Score

1 2 3 4 5 6 7 8 9 10

1. Lower back. Rate the current condition of your lower back.

0 1 2 3 4 5 6 7 8 9 10

2. Upper back. Rate the current condition of your upper back.

0 1 2 3 4 5 6 7 8 9 10

3. Neck. Rate the current condition of your neck.

0 1 2 3 4 5 6 7 8 9 10

4. Right shoulder. Rate the current condition of your right shoulder.

0 1 2 3 4 5 6 7 8 9 10

5. Left shoulder. Rate the current condition of your left shoulder.

0 1 2 3 4 5 6 7 8 9 10

6. Right wrist. Rate the current condition of your right wrist and hand.

0 1 2 3 4 5 6 7 8 9 10

7. Left wrist. Rate the current condition of your left wrist and hand.

0 1 2 3 4 5 6 7 8 9 10

8. Right hip. Rate the current condition of your right hip.

0 1 2 3 4 5 6 7 8 9 10

9. Left hip. Rate the current condition of your left hip.

0 1 2 3 4 5 6 7 8 9 10

10. Right knee. Rate the current condition of your right knee.

0 1 2 3 4 5 6 7 8 9 10

11. Left knee. Rate the current condition of your left knee.

0 1 2 3 4 5 6 7 8 9 10

12. Right lower leg. Rate the current condition of your lower leg, and foot.
Do you suffer from shin splints, Achilles tendonitis …

0 1 2 3 4 5 6 7 8 9 10

13. Left lower leg. Rate the current condition of your lower leg, and foot.
Do you suffer from shin splints, Achilles tendonitis …

0 1 2 3 4 5 6 7 8 9 10

14. Right foot. Rate the current condition of your right foot. Do you suffer from
heel pain, plantar fasciitis, malformed toes ….

0 1 2 3 4 5 6 7 8 9 10

15. Left foot. Rate the current condition of your left foot. Do you suffer from
heel pain, plantar fasciitis, malformed toes ….

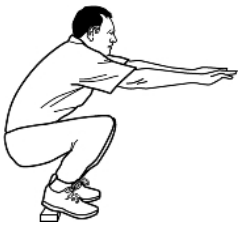
0 1 2 3 4 5 6 7 8 9 10

5. Ten point musculo-skeletal risk assessment

On the next page is the ten point musculo-skeletal risk assessment.

The test items are:

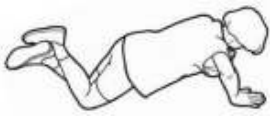
Weight and percent body fat



Squats

Situps

Pressups men



Pressups women

Hamstring flexibility

Buttock Flexibility

Shoulder function

Pass mark is 70/100. Any score below 50 is an indication of risk or evidence of current dysfunction.

A score of less than 50 is typical of a body that's either weak, over-weight, out of alignment – or probably all three.

It is not unusual for people in good physical condition to score 100/100. To do that you have to have a regular and systematic strength and flexibility training program.

The lowest score recorded was 6/100.

Any score less than 70 is redeemable. All you have to do is train.

Ten point musculo-skeletal risk assessment

1. Current musculo-skeletal condition

Wretched ... Terrific

0	1	2	3	4	5	6	7	8	9	10

2. Fatness. How close are you to your ideal weight?

Scores based on kilos over your ideal weight. # .....

>20	20	18	16	14	12	10	8	6	4	2
0	1	2	3	4	5	6	7	8	9	10

3. Leg strength - squat

Squats – to exhaustion. Bottom must get half between your knees and your ankles. Recommend use of a heel raise. # .....

<5	5	8	11	14	17	20	30	40	50
0	2	3	4	5	6	7	8	9	10

4. Abdominal and front of body strength - sit-ups with feet held – to exhaustion # .....

<5	5	8	11	14	17	20	30	40	50
0	2	3	4	5	6	7	8	9	10

5. Upper body strength – pressups to exhaustion, men on toes, women on front of thighs with knees, bottom and shoulders in a straight line. #.....

<5	5	8	11	14	17	20	30	40	50
0	2	3	4	5	6	7	8	9	10

6. Hamstring flexibility - sit and reach

Sitting on the floor, with feet outstretched in front of you, see how far down past your toes you can reach with your fingers. Keep your knees straight.

Can't touch	Fingers			Palm			Wrist
0	4	5	6	7	8	9	10

7. Buttock flexibility - ability to sit up straight

With legs crossed and hands clasped behind your back, see if you can sit up straight. Falling backwards on one or both sides scores 0.

Poor ... Good

Fall over when hands clasped behind back							Just			Easy
0	1	2	3	4	5	6	7	8	9	10

8. Shoulder function - wall test

Stand with you back to the wall. Place your hands in the surrender position with elbows, forearms, wrists and fingers flat back on the wall. Score 10 if you can do this with ease and a lower score if you can't.

Poor ... Good

0	1	2	3	4	5	6	7	8	9	10

9. Strength training

Do you have a regular and systematic strength training program for your back, neck shoulders, torso, arms and legs - sessions per week?

No ... Yes

		1			2					3
0	1	2	3	4	5	6	7	8	9	10

10. Flexibility training

Do you have a regular and systematic flexibility training program for your back, neck shoulders, torso, arms and legs - sessions per week?

No ... Yes

		1			2					3
0	1	2	3	4	5	6	7	8	9	10

Form follows function. Bones do what muscles tell them to do. TOTAL

6. Universal fitness test – fit-for-work assessment

The Universal Fitness Test involves 5 fitness tests plus an assessment of percent body fat.

1. **20 metre run** - number of 20m laps in 5 minutes This is the classic test of aerobic fitness, superseding the 'beep test'.

   One foot must go beyond the line at the end of each lap.

   It may take you several attempts to work out the best speed to start off with. You can walk, shuffle, jog or run. If you're running and you run out of puff you can slow down to a walk.

   If you're in very poor metabolic heath, start off with a slow walk and over the weeks and months gradually pick up the pace. Consult your physician if you feel you may be in very poor cardio-vascular health and request a 'proper' cardio-vascular fitness test.

Warning
You must stop if you feel you could be doing yourself grievous bodily harm.

2. **Situps** - consecutive number of situps until exhaustion - feet held, hands clasping opposite shoulders, coming up so elbows touch the knees, upper back (not head) hitting the ground.

   With feet held, the test becomes a front of body muscle test. Leg muscles, hip flexors and abdominal muscles are all involved in the situp process.

3. **Pressups** - consecutive number or pressups until exhaustion - men on toes, women on knees.

   Women make sure that your knees, bottom and shoulders are in a straight line.

   The classic upper body and trunk strength exercise. Pressups incorporate the plank exercise - in motion.

4. **Squats** - consecutive number of squats until exhaustion. Bottom must go down to mid-way between knees and ankles. Most people will need to use a heel raise to successfully complete the test.

   The classis test of leg strength.

5. **Arm hang** – hanging from a bar until exhaustion.

   Hang with palms facing away from you.

   A large proportion of people are unable to support their own weight at all so be careful and be ready to land safely on your feet if your hands fail to support you.

   The classic test of hand strength. No need of a grip strength machine, just you knowing how long you can support your own weight with your hands.

6. Percent body fat

The gold standard for body composition is percent body fat. Theoretically, there is no need to measure how fat people are because generally speaking the fitter they are the closer they will be to their ideal weight. But having said that, it's a useful metric to include in a fitness assessment.

SUPPLEMENTARY TESTS

Flexibility

The third major fact of fitness is flexibility. Tight muscles move bones out of alignment. That's the bad news. The good news is that once you have a flexibility training program muscles can move bones back into alignment again; poor function is restored to good. The body becomes pain free.

Whilst the flexibility tests don't lend themselves to the Universal Fitness Test scoring system, we have included two supplementary tests of flexibility to round out the test battery.

7. Flexibility - sit and reach – test of hamstring flexibility

In a sitting position, with feet outstretched in front of you, see how far down past your toes you can reach with your fingers. Keep your knees straight.

Can't touch	Fingers			Palm			Wrist
0	4	5	6	7	8	9	10

8. Ability to sit up straight - test of buttock flexibility

With legs crossed and hands clasped behind your back, see if you can sit up straight.

Falling backwards on one or both sides scores 0. If you can only just sit up without falling over score 5.

Fall over	Barely		Just			Perfect
0	5	6	7	8	9	10

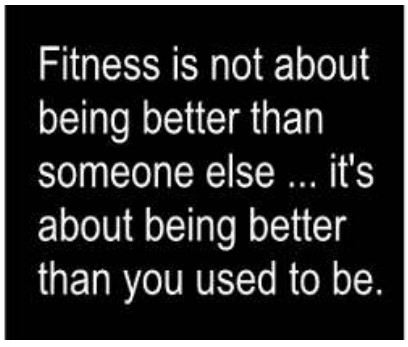
ADMINISTRATION

The Universal Fitness Test is easy to administer.

The strength tests are the same tests as you'd use to improve your strength at home.

The aerobic fitness test requires participants to see how many laps of a 20m course they can complete in five minutes. It's an adapted version of the 'beep' test, equally reliable and valid but easier to administer.

It's important you do the tests in the order recommended. Do the 20m run test first, then the situps and pressups, followed by the squats and arm hang. If you do the squats before the situps you'll compromise your situps' score.



7. Universal fitness test award

The award is based on the lowest points scored for a particular test item. For example if you're a woman and complete 38 20mrun laps, 30 pressups, 15 situps, 25 squats and hang onto the bar for 30 seconds, the 15 situps count as the lowest score and you qualify for the 'green' award.

Highlight your best individual scores. To signify your Award, place a tick in the 'award' box (on the right hand side of the table) equal to the lowest score you achieved for the individual tests (as per the example below).

Level		Award	20m run - laps		Pressups	Situps	Squats	Arm hang (secs)		% body fat		Award
			Men	Women				Men	Women	Men	Women	
10		Platinum	55	52	70	70	70	100	80	<14	<24	
9		Diamond	53	49	60	60	60	80	60	<16	<26	
8		Ruby	50	46	50	50	50	60	50	<18	<28	
7		Emerald	45	43	40	40	40	50	40	<20	<30	
6		Gold	40	38	30	30	30	40	35	<22	<32	
5		Silver	38	36	25	25	25	35	30	<24	<34	
4		Bronze	36	34	20	20	20	30	25	<26	<36	
3		Green	32	30	15	15	15	25	20	<28	<38	
2		Amber	26	24	10	10	10	20	15	<30	<40	
1		Red	22	20	<10	<10	<10	10	10	<35	>45	
0		Black	<22	<20	<5	<5	<5	<10	<10	>35	>45	

Strength tests taken until exhaustion - without stopping. 20m run - laps in 5 minutes

POINT SCORING SYSTEM

You can also score points based on the level achieved for each test item.

Points received in the example above are:

Test	Points
20m run	
Pressups	
Situps	
Squats	
Arm hang	
% body fat	
TOTAL / 50	

8. Principles of Musculo-skeletal Dysfunction

1. Muscles take bones out of alignment. That's the bad news. The good news is that with the right set of flexibility exercises there's a good chance the muscles can get bones back into alignment.

   If you have joint pain, the pain is telling you that the muscles supporting the joint are not doing the job they were designed to do. The pain is a message to strengthen and loosen muscles and realign the bones on either side of the joint and in other parts of the body.

2. The underlying source of the pain is rarely at the site of the pain. For instance, tight calf, hamstring and buttock muscles may be significant contributors to lower back or a neck pain. The body acts as a unit and misalignment in one spot may lead to may lead to misalignment (accompanied by joint and muscle pain) in another spot.

3. Following on from point (2) treat pain in one area as a system problem and not just a single joint or muscle problem. The skeleton is an integrated system. Work on the principle that if you concentrate on fixing the system the parts will look after themselves.

4. Form (good skeletal alignment) follows function (the ability to perform the flexibility postures that people in good musculo-skeletal health can perform).

5. Most people have slight postural imperfections which end up causing pain in other parts of their body. You can spot these imperfections quite easily; feet splayed out, knees knocked in, one shoulder lower than the other, backs of the hands facing forwards in the 'gorilla posture' ... The postural imperfections are magnified and exacerbated by such things as slouching over the computer, holding the phone between ear and shoulder, hand and foot dominance in the sports that people regularly play ...

6. If it's not getting stronger it's getting weaker. If it's not getting looser it's getting tighter. Without a regular and systematic strength and flexibility program you run the risk of joint and muscle pain.

7. Stretching (loosening tight muscles) is necessary but not sufficient. You need to strengthen the muscles which support your body in correct alignment, with specific strength exercises as well as the general exercises that come as part of a regular and systematic strength training program.

8. Treat joint and muscle pain as a symptom, the cause of which is eminently fixable, providing you don't leave it to a therapist to take full responsibility for your dysfunction. Do something to yourself and there is a good chance it will get better.

9. We need to make the distinction between an injury and a dysfunction. Injuries have external causes, they happen to people, things fall on them, they fall off things … Dysfunctions have internal causes. They are, in the main caused by a lack of strength and flexibility and an inability to maintain the body in good alignment.

10. Only on the very rarest of occasions is joint and muscle pain caused by a lack of rubbing, crunching, heating, cooling, vibrating, hanging-upside-down, electronic nerve stimulation, strapping, crèmes, doping or surgery.

11. Use a wide range of modalities, regularly and intensively to speed up the rehabilitation process. Most people spend less time in ten years working systematically to fix up their bodies than an elite athlete would do in a week. That's why they never get better.

12. Most big problems start of as small problems that you don't address.

13. It would be more appropriate to describe most occupational over-use injuries as under-use injuries. The muscles designed to support the body while you work aren't up to the task. This applies equally to a sit down job as a pick and shovel job.

14. Nutritional supplementation may make a contribution to easing joint and muscle pain.

15. It's a big ask expecting your body to get better by having someone do something to you. Sooner or later you have to do something to yourself. Strength and flexibility exercises are a must. Be wary of therapists who provide palliative treatment without giving you a set of exercises that bring bones back into alignment.

9. Motion Starvation

The major cause of musculo-skeletal dysfunction is motion starvation. We don't move enough. The body that was designed to climb trees, chop wood and draw water can no longer push a pen or tap a keyboard without becoming dysfunctional!

If you want a good example of motion starvation look no further than your shoulders and arms. Due to lack of systematic exercise most people have lost an ability to lift and carry their own weight. As an illustration, next time you're at a children's playground see if you can traverse the full length of the monkey bar. See if you can hang for more than 30 seconds. There is a good chance you won't be able to do it because the last time you did it you were stronger and maybe 30 or 40Kg lighter. (WARNING this is a potentially dangerous exercise for people who are overweight and have lost the strength of their arms and shoulders. You could suddenly let go, land on your back and crack your skull.)

It's drawing a long bow to blame your job for your musculo-skeletal dysfunction. Most of the people I see with back, neck, shoulder, wrist, hip and knee pain are not keeping themselves strong or flexible enough to push a pen or tap a keyboard - let alone wield a crowbar or lump bags of wheat - without becoming dysfunctional. That it should come to this! The species designed to chop wood and draw water can no longer chop wood and draw water!

Not that long ago, if you weren't strong enough to wield a pick and shovel you didn't last long in a pick and shovel job. Nowadays, few people would believe they needed to have a strength and flexibility training program to sustain the demands of a sit down job. Nevertheless it's true. If you want to protect yourself from sore shoulders, RSI and a crook back, start training.

It's not the mouse, stupid! Of course, the great tragedy of modern office ergonomics is that the chair, the desk and the mouse are blamed unfairly for the cause of musculo-skeletal dysfunction. On the contrary, it is the person with a strength, flexibility and/or postural problem who succumbs to dysfunction.

RESULTS OF THE GLOBAL BACK CARE MUSCULO-SKELETAL RISK SURVEY

1. Only 5% of people had a reasonable strength and flexibility training program. Their average total score on the profile was 84.
2. Only 10% had a reasonable flexibility training program, Their average total score on the profile was 75.
3. Only 17% of people had a reasonable strength training program. Their average total score on the profile was 74
4. The average total score of the 58% of people who had no strength or flexibility training program at all was a miserable 46.
5. Those who were 15 - 19kg over weight had an average total score of 40
6. Those who were 20Kg or more over weight had an average score 36
7. People who couldn't do 1 situp had an average score of 38.
8. People who couldn't do 1 pressup had an average score of 32

.

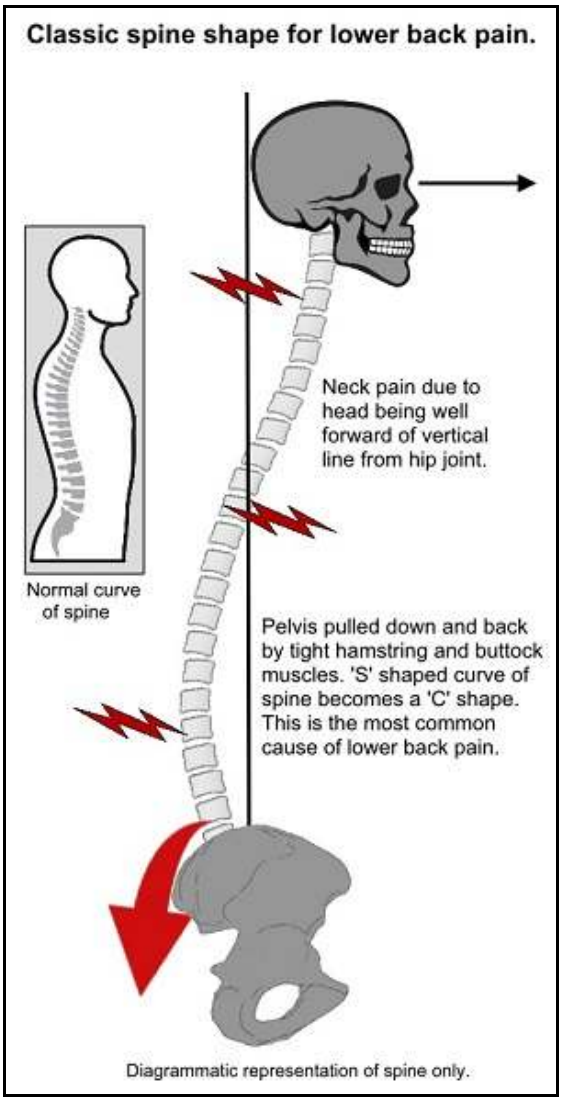
10. The genesis of joint and muscle pain

Whilst lower back pain is the most frequently reported symptom of joint and muscle pain, neck, shoulder, hip and knee pain aren't far behind. Some of the pain - but only a small proportion - is the result of trauma: people have accidents.

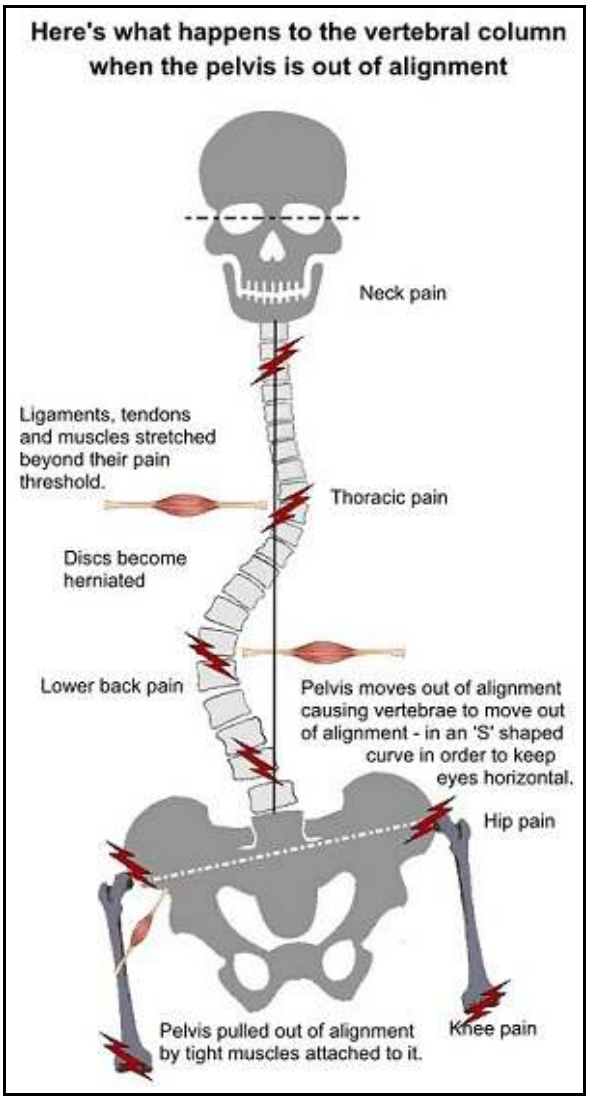
Back pain is often alleged to be the result of lifting, but it's an allegation that doesn't stack up well in court. Think about it. People go to the gym and lift weights to make them stronger. Rarely do they come down with back pain. Go figure!

Most joint and muscle pain allegedly caused by lifting is personally-generated. If the skeleton is already out of alignment, if muscles are weak, then lifting a leaf off a lawn is enough to send some people 'over the edge'. The lifting incident and the site of the pain distract our attention away from the most likely cause.

SIDE ON



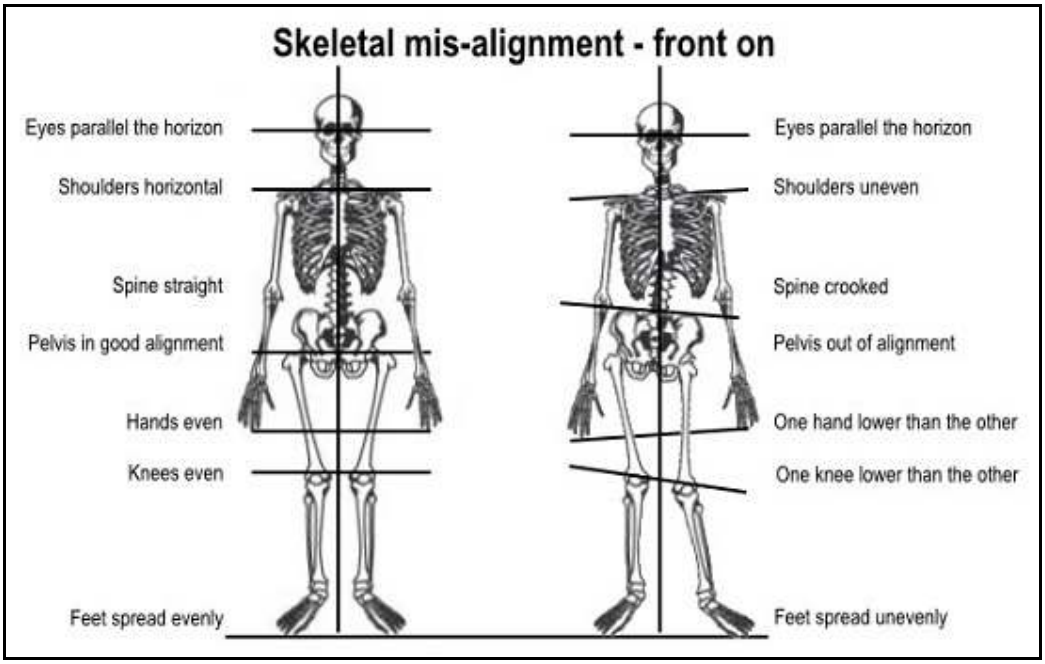
FRONT ON



So who do you blame?

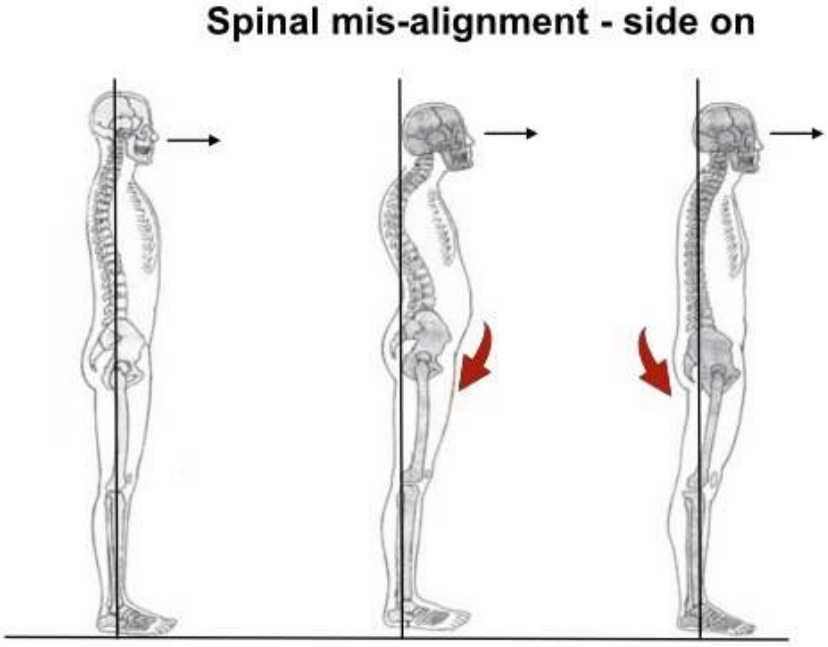
1. Blame tight muscles for taking first the pelvis and then the bones above and below it out of alignment.
2. Blame weak muscles for their inability to support the skeleton while lifting, pushing, pulling etc …

If pelvis is out of alignment, the spine twists and turns in order that the eyes can look straight ahead and remain parallel to the horizon. In the side-on diagram, the natural 'S' shaped curve of the spine becomes a 'C' shape.



If pelvis is out of alignment, the spine bends and twists in order that the eyes can look straight ahead and remain parallel to the horizon. When vertebrae are out of alignment, ligaments, tendons and muscles are stretched beyond their pain threshold. Discs become herniated.

Looking at the spine and pelvis side on …



Pelvis in good Alignment, 'S' shape curve of spine.

Pelvis tilted forward. Exaggerated 'S' shape curve of spine.

Pelvis tilted back. 'C' shape curveof spine. The most common cause of back pain.

THE (EXAGGERATED) CLASSIC POSTURE OF SOMEONE WITH LOWER BACK, NECK AND SHOULDER PAIN

Due to the action of tight muscles attached to the pelvis - front, back and sides - but particularly the hamstring and buttock muscles, the pelvis is taken out of alignment.

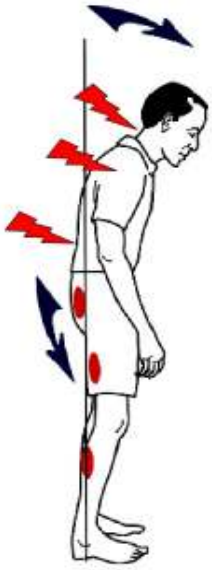
There's collateral damage as bones in the lumbar spine are dragged out of alignment.

The 'S' shaped curve of the back becomes a 'C' shape.

Ligaments, muscles and tendons are stretched, beyond their pain threshold, resulting in continuous pain.

Discs prolapse with the nucleus pinching the spinal column. It feels like someone's shoving a red-hot poker in your back every time you sneeze of cough.

Your experience sciatic pain as the prolapsed disk pinches the sciatic nerve



Tight calf, hamstring and buttock muscles pull pelvis back and down.

Bones in the upper part of your spinal column are pulled out of alignment.

Head and shoulders move forward placing stress on soft tissues around the neck and shoulders. It's a principal cause of sore shoulders.

It feels like your upper back, neck and shoulders are on fire.

You're always hanging out for a neck and shoulder massage.

You're always off to the therapist to 'pop' the bones back into alignment.

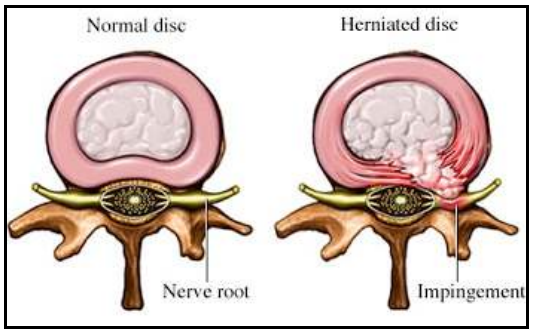
Back pain is not due to a lack of rubbing, crunching, heating, vibrating, doping or surgery.

So what we're looking to do is go

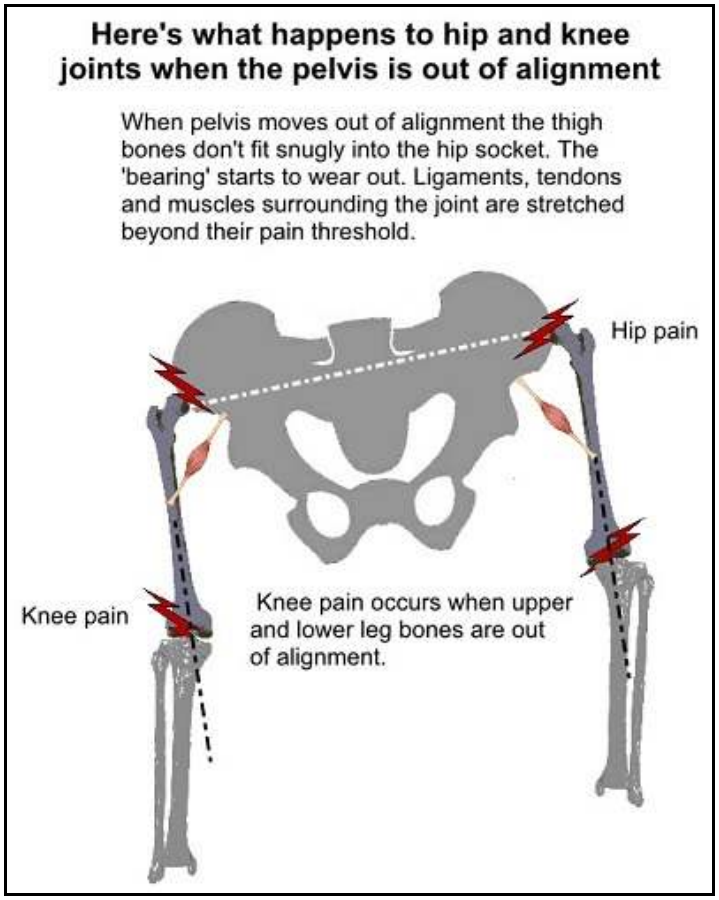
From this …

… to this

Here's what happens to a pelvis and spine that's out of alignment. Discs herniate. More pain! The treatment? Get the vertebrae back into better alignment and take pressure off the discs.

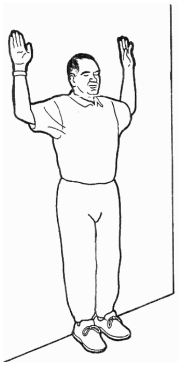


HIP AND KNEE PAIN

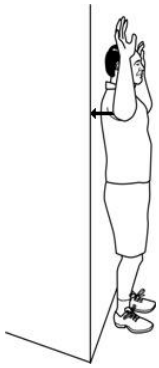


SHOULDER PAIN

The genesis of a lot of shoulder pain is tight hamstring and buttock muscles, the net effect of which is the 'C' shape curve of the spine - and shoulders out of alignment.



Good shoulder function. Wrists and fingers against the wall in the surrender position.



Poor shoulder function. Forearms well away from the wall.

Most people with shoulder pain can't get their arms flat back against a wall in the surrender position. In fact it's not uncommon to see people who have a gap of at least 20cms between their vertical lower arms and the wall.

The other cause is tight muscles around the shoulder girdle.

This means that if you want to improve your shoulder function you have to do the exercises to relieve lower back pain as well as strength and flexibility exercises at the shoulder level.

NECK PAIN

The genesis of a lot of neck pain is tight hamstring and buttock muscles the net effect of which is the 'C' shape curve of the spine - with shoulders and head out of alignment.

Head in good position

Head in poor position

Men with sore necks usually have a head that's too far forward of where it should be. When they put their head back against a wall their eyes will be looking up at the ceiling. Their heads can be anywhere up to 10 cms too far forward when they are looking straight ahead. The weight of the head pulls ligaments, tendons and muscles beyond their pain threshold. Over time bones move out of alignment. Discs between the bones become herniated.

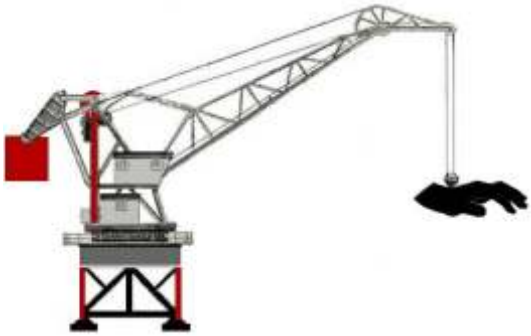
Women with sore necks tend to have weak muscles in the neck region. The muscles designed to support the head on the top of the shoulders aren't up to the job.

WRIST PAIN

Wrist pain comes at the end of a long chain of dysfunction. In particular it is intimately related to the state of your trunk and shoulders.

This is because the wrist is at the end of a complex set of levers and unless the foundation is rock solid, and the whole system is strong and working properly you can finish up with upper back, shoulder and wrist dysfunction all in one go.

If the system is not kept in good working order, it's pretty much pot luck which part of the system will go first.



For some people it's the wrists. Most people with wrist pain have neither a general nor a specific strength and flexibility training program.

THE BEST ADVICE

The best advice your mother and primary school teacher ever gave you was to sit up straight, pelvis tilted slightly forward, abdomen relaxed, and hollow in lumbar spine.

The ideal sitting position is with the back of the chair pressing up in under your shoulder blades, with an 'S' shaped curve of your spinal column and the desk pressing into your abdomen.

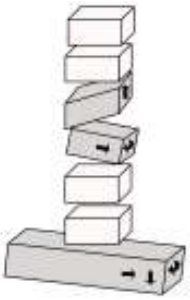
Your spine should be in a graceful 'S' shape. When you change it to a 'C' shape you're in strife! However, you can't think yourself into sitting up straight. First you have to make sure the muscles designed to keep your pelvis and the bones above it in correct alignment (and in this case, sitting up straight) are doing their job.

Secondly you have to get the chair and the desk set up properly and sit with your abdomen pressing in to the desk. That way 'you're locked in', sitting up straight.

The best advice I can give you is to keep yourself strong and flexible. If you don't you're setting yourself up for joint and muscle pain.

A BODY OUT OF ALIGNMENT

A body in alignment stays in alignment unless acted upon by a force. The force that usually moves bones out of alignment is created by your own muscles. That's the bad news. The good news is that you can use the force created by your own muscles to get your bones back into better alignment.



Muscles attached to the pelvis cause it to tilt and rotate; bones above it move out of alignment.

THE BEST THERAPY

Passive manipulative therapy doesn't take the place of what you can do for yourself. It doesn't make your muscles stronger. It may make them looser. It may speed up the rehab process. So even though you may feel better after a rub down or a crunch, the cause of your problem – a lack of strength and flexibility isn't being addressed. You have to do that yourself.

The best therapy is a regular strength and flexibility training program: the sooner you start, the sooner you'll be on the road to recovery. Again, any manipulative therapy you have may help speed up the rehab process.

SYMPTOM MASKING HEALTH CARE versus RESTORATIVE HEALTH CARE

If you're not getting stronger you're getting weaker. If you're not getting looser you're getting tighter. Sooner or later there's every chance you'll come down with some sort of joint and muscle pain. You'll rush off to someone wearing a white coat for some manipulative therapy. You may feel better – for a while – but you have to keep going back for more treatment. More treatment equals more money. Meanwhile you're not getting stronger or looser.

If you embark on a regular and systematic strength and flexibility program there's a fair chance that for 80% of people there's an 80% chance that they can get themselves back to 80-% of 'good shape' in around 80 days.

11. Manual handling

There are two reasons why organisations need to have a manual handling policy. Firstly as a duty of care and concern. No employer wants people to injure themselves lifting or put up with joint and muscles pain as if it's just another aspect of getting older.

Secondly it behoves all staff to keep their skeletons in good alignment and their bodies strong so that they don't injure themselves and thereby avoid making claims on the employers insurance.

MANUAL HANDLING PRINCIPLES

1. Bring the load close into your body.

If you're lifting something off a bench, slide it towards you, get your hands underneath it, bend your legs and then lift it.

2. Step and Swivel

You've lifted the object, now you have to put it somewhere.

Once again, use the big muscles of your body to do the work – ie your legs.

Rather than swivelling at the hips, turn the whole of your body using your legs.

3. Lifting technique

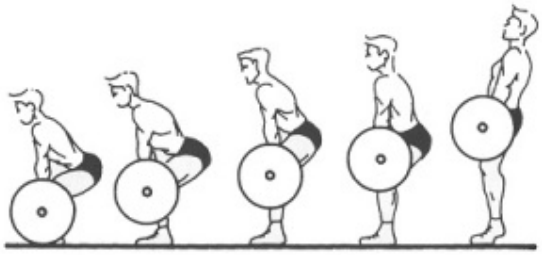
You'll see a lot of poor examples of 'safe lifting' on office corridor notice boards and on the internet, showing someone lifting a box off the floor with their heels off the ground, trying to lift it using one leg, with their centre of gravity in such a position that as soon as they lift the object they're going to fall over.

The first three shaded illustrations #1 - 3 are highly unstable platforms from which to lift a heavy object. They're not safe. You won't be able to lift heavy weights because you can't properly engage the leg extensor muscles, the body's strongest muscles, quadriceps and buttock. You could fall over. No-one ever successfully carried out a heavy lift using these techniques. You can't perform a safe life standing on your toes and with legs bent more than around 90 degrees at the knee joint. The flaw in illustration #4 is obvious. The lift load is being borne by the back muscles.

Poor lifting position				Good lifting position
1. 	2. 	3. 	4. 	5. 
Unstable, left foot not anchored to support lift. You're not in a position to engage the leg extension muscles.	There's no strength in this lift. Left foot not anchored and body unstable and about to topple backwards.	You can't lift safely balancing on your toes. It's not a stable lifting platform. You can't engage the leg extension muscles.	Leg extension muscles already extended. All that's left to support the lift are the back and abdominal muscles.	Feet flat, stable foundation, leg extension muscles, primed to do the heavy lifting.

Get into a position where the big muscles of your legs are ready to do the heavy lifting. Spread your legs so they are shoulder width apart. Make sure your feet are flat. In this position it's only after the legs are extended and the load having an upward momentum that the back and abdominals muscles are engaged to complete the lift.

Here's an example of good form.



If you're going to take a lead on how to lift, take it from the weight lifting professionals. Legs bent, legs doing the initial heavy lifting and back not coming into play until the weight already has momentum.

And don't forget it's not all about lifting up! There's a lot of lifting down as well. The same techniques apply. Use the big muscles of the legs to do the heavy work.

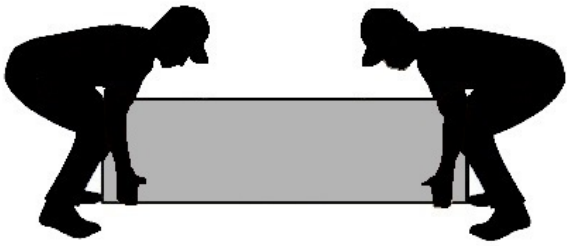
4. Stay strong

Never under-estimate the need for strong muscles right throughout your body. To protect yourself from lifting incidents you need to keep your musculature strong. Not many people can do that without having a regular and systematic strength training program.

The fact is, it's a lack of strength that has the most significant bearing on manual handling incidents. Some people aren't strong enough to pick up a leaf off the ground or clean their desk without herniating a disc!

You can get serious and train at the gym three times a week or you can make sure you can do 30 situps, 30 squats and 30 pressups.

And never under-estimate the need for strong abdominal muscles. They take more of the load than the back muscles.

5. Don't attempt to lift something you think is too heavy. Get help. And then when you do the lifting, make sure feet are flat and legs bent at about 90 degrees.	

6. Use a machine.

Sheldon Health care

Crown

The things fit and healthy people ought to be able to lift and do without causing themselves an injury.

Sitting down

The activities below are the ordinary, every day activities people expect to be able to do at home, in their leisure time or at work without ending up in pain.

Think about it: how can you injure yourself sitting down at a desk or behind a steering wheel – except by your own hand?

Standing up and working while bending down

Bending over

Lifting a bag

Carrying a suitcase

Cleaning a desk

Carrying a ream of paper

Lifting and swivelling

Putting books on a shelf

Changing a tyre

Laying bricks

Shearing sheep

Pushing a wheelbarrow

Shovelling

Vacuuming

Polishing

Scrubbing

Mopping

Cleaning windows and walls

Using a whipper snipper

Pushing a hand trolley

Getting down out of a truck

No claim form at home …

…or at Woolworths

You can injury yourself playing sport, but you take your chances. Not many people sue their sports club for a twinge.

AND THERE'S MORE

It makes a mockery of anyone who ever went to a gym and embarked on a strength training program that someone should receive even as much compensation as a brass razoo for lifting a box out of the boot of their car.

A FINAL WORD

Sensible shoes
Every organisation needs a sensible shoe policy, a working boot policy and a high heels policy. High heels are neither safe, healthy nor sensible.

Holding on to rails
In many organisations it's well nigh a sackable offence not to hold onto a rail while going up or down stairs. You only have to trip once in 10,000 times and you could do yourself a catastrophic injury.

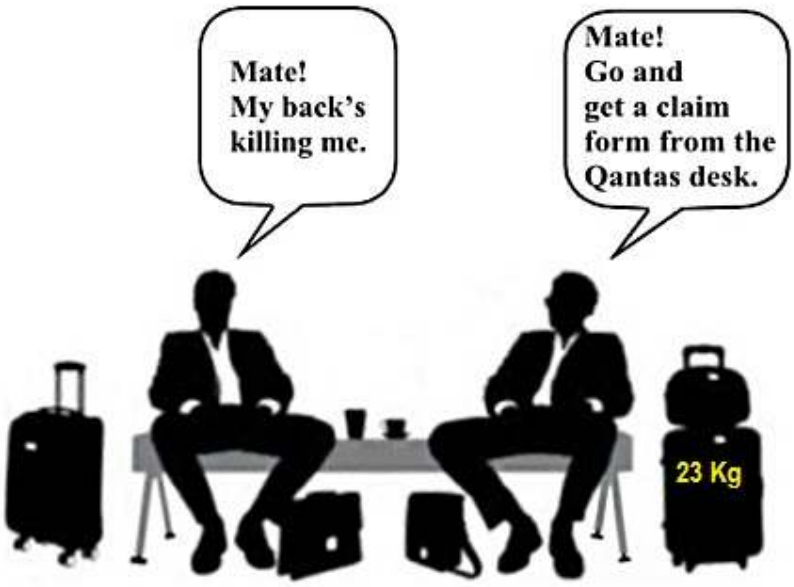
All staff have an obligation to call our colleagues who fail to hold onto rails.

Sprained ankles
What are you going to do about a sprained ankle?

First up, spraining an ankle is just another incident that's part and parcel of life. It can happen to anyone, anywhere, at any time.

Give it the best first aid possible; that includes instant icing, strapping, elevating and not bearing weight on it.

The case for all staff doing a first aid course is compelling. Most of the aid will be the aid they give to themselves.



12. Fundamentals of a strength training program

You're setting yourself up for musculo-skeletal dysfunction if you don't have a regular and systematic strength training program. As muscles become weaker, their ability to hold the body in its correct alignment is greatly diminished.

The ability to do every day tasks – lifting, pushing, pulling, carrying, propelling your own weight … becomes diminished. You're unable to do the things that strong people can do.

You can imagine, for instance the cause of your neck problem. The muscles of your neck and shoulders are not strong enough to hold you head on top of your shoulders. The head tilts forward and starts straining the muscles, tendons and ligaments; it hurts. Sooner or later bones are moved out of alignment. Then it really hurts. Then discs start protruding. A quick rub down, an anti-inflammatory and a muscle relaxant do little to fix the problem.

Unless trunk muscles – front, back and sides - are strong you're setting yourself up for back pain.

STRENGTH

Strength is the ability of a muscle to exert a force. Lack of strength is one of the main contributors to musculo-skeletal injury. 40% of people are not strong enough to push a pen or tap a keyboard without getting a crook back, stiff neck, frozen shoulders or RSI.

Muscle strength and tone can be enhanced by working against a resistance in a regular and systematic strength training program.

Include the major muscle groups in your workouts: legs, trunk, arms, neck and shoulders. I recommend a strength training program that includes the following exercises, sets and repetitions.

STRENGTH AND MUSCLE BULK

This program with its high number of overall repetitions and ever increasing weight will provide you with a balanced approach to improving muscle strength (heavier weights, low repetitions) and muscle bulk, (lower weights, high repetitions).

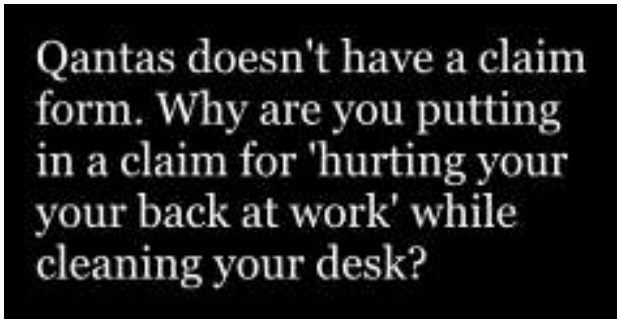
Maintaining muscle bulk is essential if you are to keep your metabolic rate up. If your metabolic rate drops and you keep eating the same amount of food, you'll start putting on fat. Therefore an essential aspect of a fat loss program is to improve muscle bulk so you burn off more calories, even without exercising.

FREQUENCY

Three times a week is ideal.

CORE STRENGTH

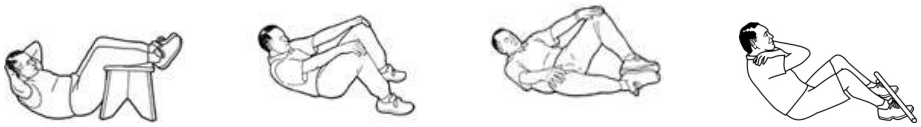
My definition of core strength is the strength of any muscle attached to your pelvis and your spine.



13. The four great strength exercises to do at home

1. SITUPS
You can do your situps in a variety of ways.

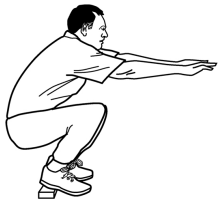
Gradually build up the number you can do on the trot. 20 feet held situps is good 30 is better and 40 is best.



2. PRESSUPS
King and Queen of shoulder and upper back exercises. Considering that pressups are 'plank-in-motion' they're also a good trunk strengthening exercise.

Gradually build up the number you can do on the trot. 20 is good 30 is better and 40 is best.

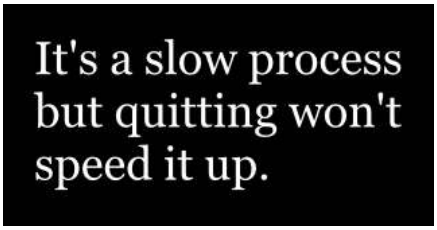
3. SQUAT
This is a great exercise for building up the thigh muscles From a standing position, squat down with your backside as close to your heels as it will go, and stand up straight. You may use a heel raise (as illustrated if you need to.) Build up to 20 repetitions at a time. If this is too hard an assignment, hang onto a rail or come down only part of the way. You could put an upturned bucket or pot plant to squat down to.



4. SUPERMAN BACK ARCHES
Take the feet and knees off the ground first.

Build up to a minute's worth of gentle ups and downs.

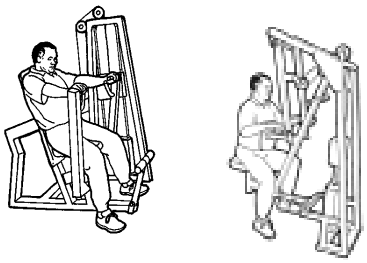
You may have to build up the strength exercises gradually by doing a minute's worth of exercise in small doses. For instance, spacing 40 sit-ups out over five sets of 12, 10, 8, 6 and 4 repetitions will add up to a good minute's worth of activity. The back arches can also be varied, lifting the chest off the floor with hands by the sides, or on the lumbar spine, or lifting one arm together with the opposite leg, or both arms and legs at the same time if you're up to it.



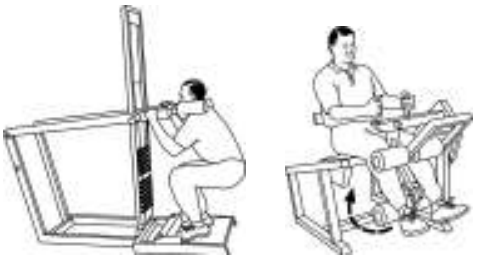
14. Strength training program in the gym

Based on supersets, where you do two exercises that work opposing muscles in the sequence of repetitions, 12, 10, 8, 6 adding weight to each set. Using supersets you don't have to rest between sets.

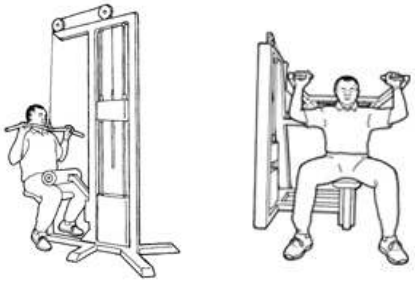
The routine should take about 40 minutes. As the weeks and months go by you will be able to use heavier weights. Three times a week is ideal. As you become stronger you'll find your musculo-skeletal system feels better. I recommend you work with a partner alternating between the machines.



Push out and pull back



Leg extension and leg curl



Pull down and push up

Sit up and back extension

To change one's life:
Start immediately.
William James

15. Fundamentals of a flexibility (muscle loosening) training program

Flexibility refers to the ability to maintain a wide range of movement about the joints of the body. When they are not stretched regularly, muscles and tendons become shorter and the range of movement around the joints decreases.

When it's all boiled down we're really talking about creating the conditions for muscles to loosen off. It normally takes about a minute for a muscle to get the message that it's save to loosen off so do your stretches for at least that long. With every breath you breathe out just feel the muscle relaxing off.

Crook backs go well with tight back, buttock, hamstring, hip flexor and calf muscles. Crook necks and shoulders also benefit from stretches that are focused on parts of the body lower down - as per our belief that the site of the pain is probably not the site of the cause of the pain. Loosen and strengthen muscles attached to the pelvis so that you stand in a better posture and you may well find your neck and shoulders start to feel better.

By far the greater proportion of people who complete our musculo-skeletal risk factor profile do not have a regular and systematic flexibility or strength program. Is it any wonder then that 30% of adults have some form of musculo-skeletal dysfunction?

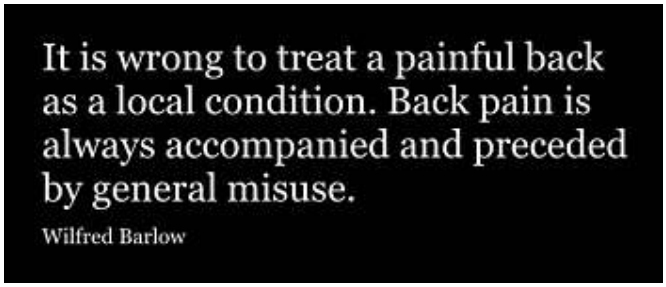
ONE MINUTE FLEXIBILITY TRAINING PROGRAM

We recommend the one minute flexibility training program for people with crook backs and necks. What this means is that you need to do each exoreic for at least a minute to get any benefit from it. If you can stretch for longer, so much the better. Many of the exercises will enhance joint function if you stretch for 2 or three minutes.

I often do my stretches while I'm watching television. That way I can take my time and spend as long as I like doing them.

I recommend isometric stretching as an effective way of loosening tight muscles and have included some isometric neck stretches in our list.

If you regularly do the exercises listed on the next few pages, there is a good chance that your back, neck and shoulders will feel better. A minute spent on each exercise can make a big difference.



16. Flexibility exercises

If you're in acute back pain, do the first three (shaded) exercises for the time suggested. Incorporate hip crossover into your regular maintenance program for a minute each side. For (shaded) hip crossover 20 minutes is good, 30 better and 40 best.

Static back 20 minutes

This is the most comfortable position for anyone with a crook back. Lie in this position for 20 minutes or more to settle down muscles attached to pelvis and spine.

Supine groin stretch – 20 minutes each side

Laying on back, one leg on bolster the other on the floor. Relax in this position for 20 minutes each side.

Hip crossover – at least 20 minutes, 5 minutes a side over and over.

Start with the heel of the right foot up toward the top of the left knee. Push the right knee way from you. Then drop the right foot and left knee onto the floor on the left side of your body.

Hip stretch

Tuck the right foot behind left knee. Take right knee over close to the floor on the right side of your body. Repeat on left side.

Super hip and thigh stretch

Start with feet together and extended. Swing the right leg out over the left and grab hold of the right foot with your left hand. Keep your right shoulder on the floor. If you can't grab your foot, grab your sock or the bottom of your trouser. Repeat on other side.

Heels over head

You used to be able to do this when you were a kid. Start doing it again. 30 seconds is enough. With every breath you breathe out, creep back a little further. When you can hold your toes with the back of your hands on the floor, report back!

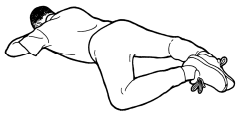
Sit up straight buttock stretch

Sit with both legs straight out in front of you. Fold the left leg under the right and then the right over the left. Prop yourself up on your knuckles, and lean forward for 20 deep breaths.

Hamstring

With legs outstretched hold on to lower leg as far down as is comfortable. Bend knees slightly and place hands further down, then straighten legs. Do for times, each time extending the stretch.

Reverse frog - knees out



Knees out, soles of feet together, chin on chest and front of pelvis on the floor. Let your feet hang down.

Alternate dog and cat stretch

Cobra

Keep pelvis on the floor. Stretch upwards. Breathe out and feel lumbar spine loosening off.

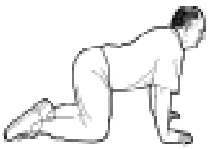
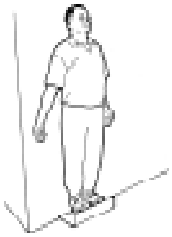
Reverse cobra

Place a cushion underneath your knees. Do this exercise for as long as you like.

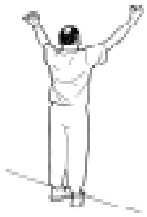
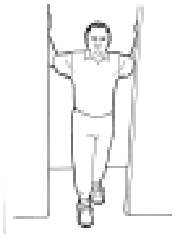
Buttock stretch

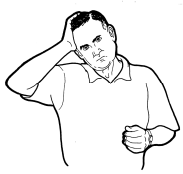
Start on hands and knees. Place right leg over the left, onto the knee and the laces and then slide it back and prop on your elbows. Repeat other side.

Alternate cat and dog stretch

Hip flexor stretch  On one knee with the other foot well forward, pelvis arched and back straight. Stretch forward to loosen groin muscles.	Cat stretch  With hands close together under the chest, tuck the tummy in, push the pelvis forward and get a high arch in thoracic spine. Breathe out. Alternate with dog stretch.	Dog stretch  With hands close together under your chest, poke your bottom out and get a hollow in your lumbar spine. Breathe in. Alternate with cat stretch.
Quadriceps stretch  Place foot on With every breath you breathe out, lean back further. This is a must do for knee pain.	Calf stretch  Stand for 3 minutes with back to wall on sloping board.	Pillow squeeze  Sit up straight, hollow in lumbar spine and shoulders pinched. Squeeze pillow 15 times.

NECK, SHOULDERS AND ARMS - strength and flexibility exercises

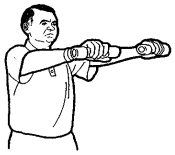
Wall clock  Stand with feet pigeon-toed and touching the wall with thumbs pointing out. Spend a minute each with hands at 12 o'clock, 10 o'clock and parallel to the floor.	Doorway squeeze  Stand with one foot just inside a doorway and push forward to stretch the muscles of the upper back. Do 20 repetitions.	Arm circles  With palms down and thumbs pointing forward, circle arms forward 20 times. Turn palms up, point thumbs back and circle backwards 20 times.
Shoulder blade pinch  Squeeze elbows back to pinch shoulder blades. 20 times.	Elbow squeeze  With knuckles on temples, swing elbows back as far as you can and then to touch at the front. 20 times.	Pull your head in  Pull your head in underneath your armpit and stretch the muscles at the back of your neck. Do this for a minute each side.

Neck isometric strength/stretch	Neck isometric strength/stretch	Shoulder stretch
		
Push the head against the right hand for 7 seconds, relax and let head flop toward the shoulder. Repeat two more times then do the same thing to the left.	Looking out over your right shoulder, push the head against the hand for 7 seconds, relax and turn head further behind. Repeat twice then do the left side.	With a partner, one person pulls the arms back to stretch the muscles at the front of the shoulder.

NECK STRENGTHENERS AND MOBILIZERS

Neckups	Eye to shoulder	Ear to shoulder
		
Lift head up toward the chest. Don't let head touch the ground until you've done 10 repetitions.	Lift head up a centimetre and then turn toward right shoulder and then left. 5 times each side.	Lift head up a centimetre. Take right ear toward right shoulder and then left ear to the left shoulder. 5 times each side.

SHOULDER STRENGTH ROUTINE - WITH DUMBELLS - build up to 4 'laps' of the routine

Arms to the front	Arms to the side	Arms above the head
		
4 repetitions	4 repetitions	8 repetitions

FOREARM AND WRIST STRENGTHENER

With spring grip	With dumbbell
	
Squeeze the spring in and out 20 times each hand.	Lift the weight 20 times with palm up, to the side and down. As you get stronger increase the weight.

17. Gunnado

What I'm gunnado to keep my musculo-skeletal system in exceptionally good condition.

THE LAW OF TOO MUCH AND TOO LITTLE

What do I need to do more of?	What do I need to do less of?

www.globalbackcare.com

If you want even more information about improving your musculo-skeletal health go to http://www.globalbackcare.com Sign up for the Emergency Handbook and regular newsletters.

Purchase a copy of the Global Back Care series of ebooks for the special discounted price for seminar attendees.

SPECIAL OFFER – very special offer for seminar participants:

http://www.shop.globalbackcare.com/special-offer/

If you have any questions, queries, comments, complaints, criticisms and compliments, send me an email.
mailto:john.miller@millerhealth.com.au

If you've got good news to report, send it through.

John Miller

All the ergonomic furniture in the world won't protect you from musculo-skeletal dysfunction unless it's accompanied by a regular and systematic strength and flexibility program for the muscles that are designed to keep your skeleton in correct alignment.

NOTES

Only on the rarest of occasions is joint and muscle pain caused by a lack of rubbing crunching, heating, cooling, vibrating, shock waving, electrical nerve stimulation, anti-inflammatory cremes and gels, hanging-upside-down, taping, strapping, doping or surgery.

John Miller