APPENDIX 1:
CASE STUDY

History

A 58-year-old woman is referred to the physiotherapy department. She normally works as a receptionist at a doctors' surgery, but she has been off sick for four weeks with neck and arm pain. The work involves mostly sitting and working at a computer, though she moves around some of the time. She does not normally take any regular exercise, and since onset of her symptoms she has been even less active than usual limiting both her social and domestic activities. On the Neck Disability Index (NDI) she scores thirty-four out of a possible total of fifty, indicating severe self-reported disability (Vernon and Mior 1991); and on a 0 to 10 pain numerical scale she rates her pain as eight.

Her present symptoms are right-sided neck, scapular, arm and forearm pain and pins and needles in her thumb and index finger. She is rather uncertain as to when symptoms started, but thinks that about two to three months ago she woke with pain at the base of her neck. Initially it did not worry her much as she thought it would go away, as it had done in the past. However this time it did not go away, but over several weeks spread into her shoulder blades and out on to her shoulders.

At one point she discussed her problem with one of the doctors, who suggested simple analgesia and some range of movement exercises. This seemed to be helping until one morning she woke and the symptoms were mostly on her right side, and then over the following few days spread into her right arm. She remained at work for several weeks more, but the pain in her arm gradually worsened, spread into her forearm, and was occasionally accompanied by pins and needles in her fingers.

An x-ray revealed 'widespread degenerative changes'. She was prescribed NSAIDs and analgesics, neither of which seemed to do much except provide temporary lessening of symptoms. The doctor referred her for physiotherapy and put her off work. Although initially being off work seemed to be easier, overall in the last few weeks she feels her symptoms are unchanging.

She reports that the symptoms around her neck and shoulder blade are constant, they are there ‘from the moment she wakes up to the moment she goes to sleep’, whilst the symptoms in her arm are intermittent. They are in the arm about 75% of the day, but in her forearm only about 25% of the day; the pins and needles are infrequent, perhaps once or twice a day for half an hour or so, and she thinks they are probably less noticeable now than last month.

She finds it difficult to identify activities that make her better or worse, as with several activities her response varies depending on the length of time she remains in that position. Sitting with her neck supported eases symptoms at first, but then they get worse; walking around has the same response. She is easiest when she goes to bed, but is woken several times each night by pain, though she usually gets back to sleep relatively easily. She uses two pillows and sleeps mostly on her back; she thinks it is when she turns over that she wakes. There is no position that always makes her better, but she has noticed that the position that most consistently causes her symptoms to worsen is when her neck is bent for a sustained period, as in reading, preparing food, or ironing. Shoulder movements and neck movements are painful and both are restricted.
She reports occasionally feeling nauseous and dizzy when symptoms first got worse and spread down her arm, but not recently. She has had multiple previous episodes of neck pain; she thinks more than ten but cannot be certain of the exact number. In the past these have always been short-lived, a few days to a week at the most, and also only involved symptoms around her neck. She has never previously sought treatment, for this episode she is still taking the analgesics, she takes two four times a day. A few days ago she ran out of NSAIDs, since then she does not feel symptoms have changed at all, but wants advice about continuing with them or stopping. She reports that she is not taking medication for any other problem, has had no serious health problem in the past, and feels well except for the neck/arm pain. There is no history of major surgery, accidents, or unexplained weight loss.

Physical Examination

During the interview she reports that she initially had neck and shoulder pain, but over the last ten minutes this has spread gradually half way down her arm. On posture correction she reports immediate increase in neck pain, but after about a minute there is a definite easing of arm pain. On examination she has a major loss of retraction, protrusion is full range and easily obtainable. On attempting flexion she is unable to put her chin on her chest, but is about two centimetres off. On asking her to look up at the ceiling she reveals a major loss; extension occurs mostly in the upper cervical spine and then she compensates by extending her thoracic spine. On examining lateral movements she displays minor and moderate losses of left rotation and left side flexion, but major losses of both movements to the right. On conducting a neurological examination neither myotomal or reflex weakness, nor area of sensory loss is found. Finally, in standing you examine active shoulder movements; flexion, abduction and the hand behind the back position are all painful during movement, but nearly full range. Other movements are no problem, passively she has full range, and resisted tests are inconclusive.

She reports that the pain in the arm has gone completely, and she relates this to sitting upright during the movement testing. Initially she finds retraction difficult to perform, partly as she has so little movement available. After four or five sets of ten to fifteen repetitions though the movement is increasing, and she says the more she does the easier it gets. The focus is on her posture and her technique, encouraging as appropriate.

After a number of sets of repetitions she is told to stop and relax, but keep sitting upright. She reports the symptoms still to be right-sided neck, scapular, and shoulder pain. On re-examination of her movements however there are changes. Retraction now has minor to moderate loss, and she is able to extend about half way with some lower cervical movement now present, but still with considerable pain; both right rotation and side flexion are increased.

Upon five to ten repetitions of extension from a neutral head posture the arm symptoms begin to return, but are absent again once she stops. Retraction with patient overpressure is attempted. At first she reports this to be very stiff and painful in the middle of her neck, but again with repetition it gets easier to do, and she gets further back. After three sets of ten to fifteen she reports all movements to be easier, and the symptoms now to be in the neck and scapular area with nothing on the shoulder.
She is instructed in posture correction and regular interruption of sitting and neck flexion activities, and told to repeat the retraction exercises at least every two hours, but more regularly if it helps. She is to do ten to fifteen actively and then finish each session with about ten retractions with patient overpressure. She is told that the response to expect is as occurred in the clinic – stiff and painful initially, but gradually getting easier to do, with less and less distal pain. If the opposite happens, which is unlikely, and the pain spreads down the arm, she is told to stop the exercises and wait till the next appointment.

**Session Two**

She returns to the clinic in two days time. She reports she has been doing the exercises at least every two hours, often more regularly, and the response was similar to the first day except they have become considerably easier to do. She reports she has been sitting better, regularly getting up and walking around, and even going for walks twice a day, which she now finds help. She has been woken at night by neck symptoms only once the first night and not at all last night. She has had no symptoms in her forearm and only brief symptoms in her arm when she had been sitting and forgot about her posture. She was able to abolish this rapidly with exercises and posture correction. The symptoms are now only sometimes on to the shoulder, and principally in the neck and scapular area, they are still constant there, but on a numerical scale she rates the pain now as three out of ten. This has been the same all today despite regular exercises all morning.

On physical examination retraction has a minor loss, with flexion she is still not able to get her chin to her chest, extension is somewhat improved, but still displays a moderate loss. For rotation and lateral flexion movements to the left are full, movements to the right are painful with minor to moderate loss of range. Her posture is improved and the quality of her movements is better. Her shoulder movements are checked, these are now full range and pain-free. Her performance of retraction exercises both actively and with overpressure is accurate.

Prior to repeated movements she reports low intensity central to right-sided neck and scapular pain. Repeated active retractions followed by patient overpressure both have the effect of increasing central neck pain, but she reports a return to initial symptoms afterwards. Repeated retraction and extension is performed; again this increases central neck pain, but after repeating two sets of ten to fifteen repetitions it is clear that the right-sided neck pain is getting worse and beginning to spread out to the shoulder.

In the loaded position retraction with clinician overpressure is performed, producing an increase in central neck pain. With repetition this gets no easier, does not seem to get to end-range, and after the second set of repetitions she reports pain spreading out towards the shoulder again.

Retraction with clinician overpressure in supine is performed, this produces an increase in central neck pain, but over two sets of ten to fifteen repetitions she reports this gets considerably easier. Afterwards the right-sided symptoms remain unchanged. Two further sets of repetition produce a similar response, but full movement to end-range. After resting for a few minutes in supine she returns to upright sitting, ensuring her head remains in neutral as she does so.
Retraction with therapist overpressure in loaded is repeated; again producing an increase in central neck pain, but now the movement feels like it is getting to end-range. She is asked to retract and then extend, but she still finds this very difficult to do because of central neck pain and stiffness. To facilitate she is instructed to put both hands behind her neck with her fingers either side of the spinous processes around the cervico-thoracic junction pulling the spine forward. This enables her to do the exercise more easily, which increases central neck pain each time, but she demonstrates increasing range. After ten repetitions she reports more central than right-sided neck pain. After a further ten repetitions using her hands to support the movement she reports only central neck pain. Afterwards she reports it feels considerably easier when she does retraction extension without hands supporting.

She reports only central neck pain and an increase in all movements, especially extension, at the end of the session. She is instructed to continue with the same management as before, but now also to add in the retraction extension exercise, with support if needed. And over the next few days to do less of the retraction and more of the retraction extension as long as the response stays good. She is told to expect gradually improving neck pain, and to stop if the symptoms start to peripheralise again.

Session Three

She reports that over the last four days she has been doing the exercises regularly and doing mostly retraction extension in the last two days. As suggested the extension movement got gradually easier and easier to do, and in the last twenty four hours it has only generated increased discomfort at end-range. In the last two days she has had intermittent central and right neck pain only, for less than 50% of the day, of very low severity that she rates about one on a zero to ten scale. At present she has mild central neck pain. Range of movement is checked – she now has full range flexion, chin to sternum, her lateral movements are equal and full, but with pain at end-range or right rotation and lateral flexion, extension has a minor loss with increased central neck pain. Right shoulder movements are full and pain free and she reports no problems with neck or arm movements in the last few days.

She reports experiencing right sided neck pain. She performs a few retractions the last with overpressure and then about ten retraction extension exercises. She reports that retraction now has very little effect, and each time she extends she feels it slightly more centrally, afterwards it possibly feels slightly easier, but she is unsure. You demonstrate to her how she can do the same movement with overpressure by doing slight rotations at end-range extension. She does two sets of about ten of these movements, and afterwards reports the abolition of pain and pain free extension and right lateral movements.

You recommend that she continues with these exercises for the next week or so, or as the need arises, and also that she stretches all neck movements in all directions once a day. You discuss with her that the typical history of neck pain is episodic, but that often the movements that helped this time will help next. So at the slightest suggestion of recurrence of symptoms or loss of movement she should start the same exercise programme again. You suggest that she needs to regularly interrupt her posture at work, get up and move around; and you make a few recommendations regarding seating, lumbar support, screen height, arm rests and so on. You ask her to attend for review in a week but to contact you if she has any concerns.