Ergonomics in the operating room
How can you reduce the strain?
I followed employees who were suffering from disorders relating to stress, with both physical and/or psychological symptoms at the Sahlgrenska University Hospital in Gothenburg in 2005, and I carried out a number of preventive ergonomics projects at the clinic. Later, my services were requested by several surgical departments. From the very beginning I was fascinated by the interaction in the operating room, so much experiential knowledge is gained there and intuitive communication takes place without words! I noticed that the team sometimes fell into a common rhythm, like that of a harmonious orchestra, and at other times was arrhythmic, with erratic movements.

As a result of the assignment from Mölnlycke Health Care I now see an opportunity to highlight the importance of ergonomics in the operating room, from a holistic perspective, in which all elements are equally important, and with the target of reducing physical and psychological stress on the operating room staff and underlining communication, i.e. psychosocial interaction. Most importantly, I can now advise on what you can do to promote your health and support interaction in the surgical team!

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## Examples of ergonomic challenges and solutions in the operating room – middle booklet

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Your guide to ergonomics in the operating room (O.R.) – how to make positive changes

This booklet has been written for those of you who wish to know more about ergonomics in the O.R., O.R. nurses, nurses in training, leaders, HR personnel.

The aim is to increase awareness of the important role ergonomics has to play, and to stimulate your interest in this issue using knowledge gained from scientific research and experience over time. The hope is that you will change your movement patterns and take short breaks, in a way that enhances performance and promotes wellbeing.

A balance between the demands of the work and the resources of the individual

The Swedish Work Environment Act is based on the notion of finding a balance between the demands of the work and the individual’s own capability. The demands of the work can be described in terms of the physical and psychological strain, while the individual’s resources will vary according to age, sex, level of experience, level of education and disability.
Physical load in the O.R.

As an O.R. nurse you are a member of the surgical team. You are able to plan and perform certain tasks on your own but most work occurs in interaction with the team. Certain medical interventions are performed either sitting or standing. An analysis of the physical load indicates:

1. Static work.
2. Repetitive movements, twisting and bending.
3. Unhealthy working postures i.e. when it is crowded, difficulties to reach, poor visual ergonomics, etc.
4. Muscular tension when draughts, or tiring sounds.

During instrumentation the neck and shoulders are put under strain due to repetitive lifting with forward and/or outward turned arms. The neck and shoulders are not only overloaded by the arm lifts but also by the weight of the instruments. At times you can find yourself in a turned position with your arms stretched, and the load then becomes even greater. The greater the distance between what you are holding and the muscles carrying out the work, the greater the load. Carrying out prolonged static work, the weight from the body itself is often enough to cause strain.
Physical and psychological strain

Activity is necessary in order to keep our muscles primed for action and capable of handling challenges.

Strain is the word we use when talking about both physical and mental factors influencing our health in a negative way. The strain refers to the factors affecting the individuals in their work environment, such as what their job entails, the amount of effort they are expected to put in and the movements made at work.\(^1\)

The word load is used when it is possible to measure a physical weight and how it affects our body.

Reserve capacity

The impact of stress on musculoskeletal tissues\(^2\)

Our bodies are designed for movement and some form of weight, but they need the right amount of movement, weight and recovery to achieve a healthy performance in order to be able to maintain their various functions. Physical activity creates a reserve capacity relative to the demands of the work, which reduces the risk of musculoskeletal disorders being incurred. This buffer becomes increasingly important the older we get.

Musculoskeletal disorders

Musculoskeletal disorders refer to all forms of complaints affecting the musculoskeletal system (muscles, tendons, cartilage, ligaments and nerves) which can be linked to conditions and requirements at work. The complaints may have been caused by the work itself or by something else, but are aggravated by the work.\(^3\)
How to enhance performance during surgical procedures

The hallmarks of healthy performance are variation, a balance between work and rest and recovery when needed. What constitutes the performance may vary depending on individual resources and sensitivity. Job control is a key word including discretion, authority or decision latitude. This could be having a say about organisation, being able to influence planning and execution, working methods, working tempo, procurement and use of aids.4

This is how I promote wellbeing, as an O.R. nurse, to manage my physical and psychological strain better!

“I have to check if all material is ready for the intervention and be proactive to the demand of the surgeon.”
Corinne, Belgium

“It is quite restricted in the O.R. to manage the physical stress of the job but regular breaks, correct use of equipment trolleys and regular assessment of what the strains actually are would be helpful. From a psychological point of view teamwork is vital and regular team meetings where staff feel able to air their points of view away from the surgical table helps.”
Fiona, UK

In this way I may positively influence my colleagues in the O.R. and the surgical team and increase the team’s ability to handle physical and psychological strain!

“Initiate training sessions or discussions about how to work in ergonomic positions and contribute to create a good and healthy atmosphere.”
Petra, Switzerland

“Build after work sport groups; sports or yoga after the work to keep the stress level in balance.”
Marcus, Germany

“Support discussions to see in what other ways something could be done to help reduce the heavy workload.”
Fiona, UK
Checklist – identify the risks

The first step is to be aware of how you perform and getting to know which factors are affecting the ergonomics. Answering the following questions will give you an overview.

- How are you affected physically, psychologically, emotionally?
- In which postures or in connection with which movements do you perceive high exertion?
- How do you identify stressful situations?
- What can you do to prevent illness and promote wellbeing?
Continue by answering the following questions

Physical factors
- What are the tasks involving a static load?
- What are the movements involving bending/twisting far away from your body?
- Is the surgical equipment fully functional?
- How are the lighting conditions?

Organisational factors
- Why do you organise the different tasks in this way?
- What can you influence or not influence when carrying out your work?
- Is support available if urgent problems rise during the surgical procedures?

Psychosocial factors
- What part do you play in getting a good start of the surgical procedure?
- How are you affected psychologically by your interaction with colleagues during the surgical procedure?
- What opportunities are there for short breaks during surgery?

What the task entails
- How tough are the physical and psychological requirements of your tasks?
- What are the tasks requiring a higher amount of concentration and precision work?

The O.R. staff’s conditions and requirements
- Do you have reserve capacity, i.e. energy left at the end of the working day or week?
- Do you have or have you ever had musculoskeletal disorders?
- What physical training do you perform?
How are our muscles affected by strains; demands and expectations?

Most people are aware that work involving uncomfortable, static positions causes problems in the musculoskeletal system, as do one-sided and repetitive tasks. The same applies to tasks that are heavily controlled or restricted. Less well known, however, is that repetitive movements carried out in a stressful environment more than double the risk of injury. As research has shown, a synergy effect occurs when the strain is both muscular and psychological. Our physical health is thus affected by psychological factors. Biological processes start, which lead to pain and inflammation.⁵

Stress

Stress is the physiological reaction that occurs in the body when a human being is subjected to demands and expectations. When demands and expectations are not consistent with the individual’s capabilities for meeting them, ill health may be the outcome.⁶

When ergonomic deficiencies are discovered and these are combined with time constraints, high quality requirements, poor self regulation and low job satisfaction, the risk of musculoskeletal disorders is high.⁷
The origin of pain is something that interests many researchers. There is currently no full explanation for why acute pain turns into long-term, intractable pain, but a few hypotheses are backed up by scientific research.

The Cinderella hypothesis; long-term repetitive performance

When doing work that uses your muscles, it is always the same muscle fibres that initiate the work and then keep the work going until conclusion. The motor units are activated even with a small load and hold out until the muscle relaxes. An extra strain is placed on these muscle fibres even if the work looks quite easy. Having pauses as the performance continues will not inhibit these units, when there is a long-term psychological strain. These units will continue to be active and as a result the muscles are unable to relax after the work is done. Insufficient recovery increases the risk of tissue damage, inflammation and pain.\textsuperscript{8,9,10}

Other theories include the so-called ‘muscle spindle theory’ and ‘interaction hypothesis’. The former maintains that the structures which ‘sense’ changes in the position of the joints and muscles are adversely affected when subjected to long-term static load and this can lead to pain.\textsuperscript{11} The latter hypothesis is intriguing when you consider that the pain instead occurs after prolonged static load in conjunction with a massive expansion of the vascular bed, resulting in significantly increased blood flow. The body thus compensates for the worsened blood flow that occurs during long-term static work.\textsuperscript{12,13}

We fail to notice the warning signs. Sometimes we feel tension and/or tiredness in our muscles, but choose not to take short breaks or a longer break. This puts us at risk. Pain is the body’s most important warning system, but the quality and strength of this varies; people also vary in their receptiveness to the signals it emits. The damage can happen quickly and the body sometimes fails to keep up, which may disturb the way in which tension is controlled in the muscles. Muscles working at less than their optimum may result in a vicious cycle leading to tension and pain.\textsuperscript{14}
Varied movements at work; less need for recovery

Monotonous and static work means that the brain receives insufficient information about what is happening in the muscles. This makes it more difficult to carry out precision work, as your coordination worsens and you are slower to react.¹⁵ If different strains are combined, the need for recovery will be even greater. If you are dealing with stressful situations and try to vary your movements, muscle tension will disappear more quickly once the work is completed. To counteract the effects of one-sided, repetitive work movements carried out under time constraints, taking short breaks will not be enough; varying your movements is the most important thing to do. In the worst case, the only thing you can do is stop what you are doing; breaks and variety will not be enough.¹⁶
Ergonomics for the prevention of musculoskeletal disorders

Ergonomics for the prevention of musculoskeletal disorders is the term used to describe how strain in the workplace impacts on body parts used in movement. It deals with work posture, work movements, physical strain and other conditions which can directly impact on the health of our muscles, tendons, skeleton and joints, cartilage, ligaments and nerves. As mentioned previously, the design of work premises, workplaces, work objects, tools, surrounding environments, organisational aspects and psychological and social conditions are factors in this.17

Is it more dangerous to be a woman than a man?

Among the Swedish workforce, about 25% of women and about 20% of men stated that they have had a physical injury due to work at some point in recent years.18 Numerous studies show that the risk of suffering from muscular pain in general and work-related muscular pain in particular is almost twice as large for women as it is for men.19,20,21

A new research hypothesis argues that exposure to unfavourable psychosocial factors increases the relative risk more for women than for men.22 It is important to be aware of any early indications of excess strain as it can take months or years for an injury to develop.

Stress can therefore increase muscle tension, which often leads to pain. Chronic pain can alter the way the nervous system works, with symptoms remaining even after the strain that caused the original muscle tension has gone. One such instance is repetitive strain on the neck and shoulders when nerves and blood vessels are affected, the so-called thoracic outlet syndrome (TOS).23 Musculoskeletal disorders take longer to heal the older you get.

Risk of musculoskeletal disorders depends on:

- Your physical and psychological condition.
- What type of strain you are exposed to.
- If work takes place under psychological strain.
- How long the assignment takes you.
- How often you repeat the same movement.
- Whether you can influence how work is carried out.
Looking at the schedule today, I notice that I am booked in to help with a hip replacement in O.R. 2. I know everyone in the team well and expect everything to run smoothly. The surgeon is always well prepared, calm and steady, which rubs off on all of us in the team. It’s a ‘standard operation’ so I know which instruments are going to be used, which specific surgical equipment and which sutures the surgeon wants. After lifting down some heavy surgical trays and making sure the operating room is prepared and ready for use, I go to meet the patient. The elderly lady is nervous and shaky. I reassure her and after having answered her questions she seems to be calmed down. I also check personal details and make sure it is the correct hip that is marked to be replaced.

Time for surgical hand scrub. The circulating nurse helps me to put on a sterile surgical gown and after that I put on the sterile surgical gloves. The next task is setting the instrument table and the mayo stand. Instruments and other equipment that will be used frequently are placed on the mayo stand to be near the surgical wound. It’s now a case of getting everything in order. I count and document all equipment i.e. surgical swabs, instruments and everything else that will be used during the surgical procedure.

In the meantime, the anaesthetic staff are taking care of the patient in the preparation room and then moving the patient to the operating room. Once the nurse anaesthetist has made sure that the elderly lady has been put to sleep, I am ‘unsterile’ again and, together with the circulating nurse, the three of us help to roll the patient on to her side. We’ve adjusted the operating table to a suitable working height. The patient is now lying in a comfortable position without any risk of nerve or pressure-related injuries, and with enough space for the surgeon to operate. Now I need to scrub again and put on a sterile surgical gown and sterile surgical gloves.

The height of the operating table is adjusted and the circulating nurse lifts the patient’s leg to make it easier for me to disinfect the skin area in and around the incision site (if there are aids to help, such as a sling in the ceiling to hold the leg, this should be used). I now hurry to reduce the load on my colleague. This will involve a good deal of lifting, stretching and bending if we are not careful. Next, the patient is to be draped with sterile surgical drapes, even this can involve working positions that place a strain on you. Time to connect all the tubes and cables! The circulating nurse connects the diathermy to the diathermy equipment, the suction-tube to the suction, etc. I wait until this is done before calling the surgeon: this means less pressure and the surgeon doesn’t have to wait to get the surgical procedure started.

Long-term or frequently recurring physical, psychological and emotional strains without sufficient rest in between pose a risk to health.
The mayo stand is placed over the operating table, and the instrument table is placed close to the operating table. Now we need to make sure that the surgical team will have a proper view of the operating site! The operating lights are adjusted, and I need a footstool in order to be on the same height as the surgeon. I really do need to be able to see the wound to provide the best assistance possible, and hopefully avoid unnecessary bending, stretching and turning. There are no students present today; otherwise they would have been dressed and ready at this stage to avoid any delays or irritation.

The surgeon arrives. I have worked with him for many years, and I dress him in a sterile surgical gown and sterile surgical gloves. We are now all set; we do a safety check using WHO’s checklist, focus our minds and get to work. The surgeon leads the way, with the team tracking his every movement and following his instructions. I provide the instruments and any assistance as and when necessary. Often no words are exchanged because I know the process of the surgical procedure and I read the surgeon’s body language and movements. I can then figure out his next step. Both the surgeon and I end up in a lot of static working positions during the operation. Certain tasks require me to hold hooks in the same position for a long period of time. I sometimes feel a burning pain in my shoulders and neck, and I usually try to move them for a few seconds before moving on to the next step. Gently resting your arms against the operating table, if possible, does actually make a real difference for your neck. I sometimes notice that I almost stop breathing during the most demanding tasks, so I try to remind myself to breathe out – air will always come back in again of course! Every now and again I stand on one leg and then suddenly notice that my muscles are tired. If I can, I change position; otherwise I adjust how I am standing as soon as possible. You can’t avoid bending, stretching and turning altogether, but I really do try to reduce how often I do this because I’ve noticed how my body has become more fragile over the years, even though I exercise on a regular basis.

The surgical procedure continues. I need to be concentrated the whole time and follow what is happening in the surgical wound, as well as having the surgical swabs, instruments and other things under control. Before the wound is stitched at the end, everything has to be recounted and checked off again. To guarantee aseptic conditions and prevent infection, I do the wound dressings before the patient is woken up. It is also easier to apply the wound dressing if the patient is lying still. The draping material is removed and instruments, swabs etc are recounted and checked again prior to the patient being moved out from the O.R. It is important to have enough time set aside for this to avoid any unnecessary stress.

After many years of experience, my view is that you have to reduce the amount of time pressure, create a good atmosphere in the O.R. and show respect for one another’s skills when working together, in order to prevent strain injuries. Of course, it is also important to be physically strong and to be aware of your body to be able to assume better working positions whenever possible.

Kerstin, O.R. nurse
Working postures and working movements

According to conclusions drawn by SBU (Swedish council of Health Technology Assessment) in 2012 there is scientific evidence to say that the following strains can cause injury and illness in:

Neck and shoulders

- Working with bent and/or twisted trunk
- Work with force requirement (lifting, carrying, pushing, pulling)
- The combination of high demand and low control
- High mental work demands
- Low control or low ability to influence decision making

Shoulders

- Work with force requirement
- Prolonged work with computer mouse

Elbows and forearms

- Work with force requirement
- Repetitive work
- Prolonged work with computer mouse

Wrist and hands

- Biomechanical strain: a combination of repetitive hand movements and force requirement.

Certain traditional ergonomic problems such as heavy lifting, work requiring arms to be lifted or highly repetitive hand-intensive work has been given less attention as researchers are often of the opinion that established know-how is already available. SBU does not deny that there are links between the exposures and risk of injury outlined below, but there is insufficient research of high quality.
Proven ergonomic experience indicates that the following working movements must in general be questioned during prolonged working periods. Variation, pauses and recovery time reduce the risks.

- Bent and/or twisted work posture and work movements
- Working beyond the forearm’s range of movement far away from your body
- Periods of work where there is no arm support
- Static/stationary muscular work
- One-sided repetitive work
- Manual handling (lifting, carrying, pushing, pulling)
- Work above shoulder height and below knee height

A combination of these working postures is common. Note how working heights, precision work, lighting and other factors force us to assume unfavourable work postures for long periods of time.
Bent forward position

If one member of the surgical team who weighs about 70 kg stands leaning forward about 45° instead of standing straight, the lumbar disc will be put under about 6 times higher load. This is due to the forward momentum, which is created when the upper-body center of gravity is moved forward approximately 30 cm. To counteract this momentum the back muscles must increase their tension to maintain balance. The forward momentum of the upper-body and the tension of the back muscles together creates the increased compression force on the lumbar spine. If any load is lifted at the same time as the back leans forward the force on the muscles and spine increases even more.25

Bending and twisting

When handling instruments the neck and shoulder muscles become tired due to repetitive lifting with outward, forward and/or outward turned arms. These one-sided movements towards the mayo stand and further towards the surgeon also affect the trunk. The neck and shoulders are not only put under pressure by the arm lifts but also by the weight of the instruments. Sitting or standing away from the operating table, twisting your body with your head bent forward and your arms stretched, will place a very large load on your neck. If the table is also somewhat low your back will finish up in a bent forward/twisted position.

Static load

When working in the same position over longer periods the muscles become tired quickly due to lack of oxygen. When carrying out prolonged static work, the weight from the body itself is often enough to cause strain. During instrumentation there is a combination of dynamic movements and static load.

Poor visual ergonomics

There is a well-established link between neck problems, unhealthy working posture and poor visual ergonomics.26 If you have a poor view, you will also adjust your neck in order to get a better view. The neck is very sensitive to static load in a bent forward or a forward displaced position and during one-sided lateral turns. The nerves are also irritated when the neck is bent backward and, even worse, if it is also turned frequently to raise your line of vision to look at a monitor in a high position.

Other physical conditions

Any kind of draughts, especially if cold, will tighten the muscles. If the ventilation is insufficient it will be too hot resulting in lack of fluid because of the temperature regulation of the body.
Manual lifting

Heavy manual handling with a lot of lifting and carrying still occurs in healthcare. It is important to avoid heavy lifting and make use of those aids available. In Swedish healthcare the aim is for no manual lifting of patients to be necessary, but they still occur.

Manual lifting:

• Hold the load close to your body
• Avoid lifting and twisting simultaneously

Manual lifting of patient:

• Always at least two persons
• Coordinate the lift
• Create movement energy by using your legs
  by transferring your weight from one leg to the other

Your challenge

The challenge you face during the surgical procedure is to perform the same job in many different postures to create a variation in movement. This in combination with short breaks will reduce muscular and psychological tiredness. Research shows that rest is required after a long and demanding surgical procedure. The body must get the chance to recover and start to repair damaged tissues. Physical activity and physical training prevent and cure diseases. The key is balance between activity and rest. Read more about this in the section about ergonomic challenges in the O.R. in the middle booklet.
Stress and psychosocial communication

Earlier definitions of stress deal with the imbalance between the demands a person is exposed to and his or her capability to fulfil or handle them.

The demand-control-support model, a classic element in stress research

This model of workplace strain states that stress is a function of how demanding a person’s situation is and how much control the person has over his or her responsibilities and amount of social support. This creates four kinds of situations: passive, active, relaxed, tense.

The active area with high demands and potential to have an impact is not seen as stressful, but may cause the person to push themselves too far. The passive work situation with low ability to influence decision making is seen to be a risk area for stress-related illnesses depending on what kind of work is performed. The tense area is at a high risk of illness. Lower demands and high ability to influence decision making is the ideal situation; relaxed.\textsuperscript{[27,28,29]}

Social support/networks are very important health factors. Security and contact reduce the strain and support regulation of the workplace stress conditions. It is therefore important that all members of the surgical team examine the mechanisms that allow them as a group to regulate stress levels. Each one needs to be physically present during the surgical procedure, this will help in creating a basis for concentration, working practice and communication.

Strain causes stress-related illnesses. High demands and low control or only high job demands, low control or low ability to influence decision making bring a risk of physical injury and illness in the neck and shoulders. The muscles are used even more than necessary in order to carry out the work. Based on the model demand – control – support, the above mentioned factors may cause physical and/or psychological pain.
The psychosocial environment is just as important as the physical when it comes to preventing musculoskeletal disorders. It is about being aware of which signals you are transmitting. Are you mirroring the strain of your colleagues and do you feel their state of mind? Which emotions are mine and which are yours? How can we as a group focus on the job in hand and cope with the ensuing pressure? How do we establish individual planning prior to a surgical procedure? How do we team up to get off to a good start? How does the surgeon work together with his/her team and how does the team comply with this? How is the team dynamically encouraged to respect each others professional skills? How do we support one another when unforeseen incidents occur? How do we finish and how do we recover after the surgical procedure? What have we learnt that is new? Notice the atmosphere and how we communicate? What support is provided outside the O.R. by the employer and/or occupational health service, and what opportunities are there to do in-service training as a team manager?

Research indicates that the ‘communication climate’ in a workplace affects the ability to manage not only psychological stress and strain but also physical ones.\(^\text{30}\)

Repetitive movements carried out in a stressful environment more than double the risk of injury.
Body awareness and body resonance

Silent communication takes place when we observe each other’s facial expressions, posture and gestures. Words are only one part of our interaction. We interpret the non-verbal with our mirror neurons i.e. the brain cells which reflect the activity in the other person’s brain cells. The O.R. nurse ‘mirrors’ the surgeon using his or her intuitive knowledge and experience of which surgical equipment is expected to be used and, thanks to the mirror neurons, foresees the chain of events. This interaction is called resonance and means that we also have the ability to imitate the condition of the autonomic nervous systems in others. It means that we unconsciously mimic breathing, the muscular state of tension and feel the same state of mind. This is called the Theory of Mind, in other words, the ability to intuitively understand and acquire knowledge about other peoples’ feelings and desires. We have the ability to predict what another person is planning to do i.e. the chain of events going far beyond the current chain of movement.31

All members in the surgical team mirror each other, not least the O.R. nurse who ‘picks up on’ the surgeon’s emotional state and his/her intention to act and move his/her body. When the team is emotionally balanced, there is better non-verbal interaction and the O.R. nurse intuitively notices which equipment the surgeon requires.
Psychosocial environment, working technique and body awareness

Research is ongoing to examine the factors which have an impact on working technique both from a physical and psychosocial perspective:

How much of a physical strain is the work assignment?

How is the working technique affected by emotions, experiences and attitudes prior to a work assignment? \(^{32,33,34}\)

It is known that unfavourable physical and/or psychosocial strain in the work environment can lead to poorer working technique.\(^{33}\)

Most activities and body movements take place automatically. When we learn a new sport or working technique, a physical presence and awareness is required to open the door to the new movement pattern. Good working technique means that we perform the movement carefully, efficiently and using the least energy possible. Having learned a new movement pattern, it is difficult for us to change the technique as it has already become an automatic reflex. Training body awareness is the same as reconquering an ability we had as children and lost as we got older. It is possible to train and develop a physical presence, but it takes time just like learning a new sport. It is best to develop it in a non-stressful, quiet and safe environment. The best results are achieved if there is a high level of motivation.
Physical presence

We are affected physically and emotionally in our encounters with others. The body balances our emotions and thoughts. We notice this on a physical level when we for instance tense or relax different muscles or other body positions, pull up our shoulders a little, cross our arms or legs, take a step forward or backward, try to make eye contact or look away, become cold or warm in our hands, etc. Our breathing is always affected at an emotional level when our emotions change and take up space in our bodies. Besides your “innerspace”, you have a “personal space” outside your body’s limits, a space which carries your energy. Your personal space upholds your integrity and your limitations.35

In our interaction with others, communication takes place best if you are “present in your body”. This is when you are in contact with your physical, psychological and emotional centre, your core, and at the same time having an understanding of your body’s limitations i.e. your skin. Your ‘personal space’, in which you store your energy in different ways depending on the situation, is often about half a metre to one metre from your body. During a surgical procedure, you often concentrate your energy to a smaller area while you are working very close to your colleagues. Doing so, you become more transparent and confident to yourself and to your colleagues. Sometimes you take up more room by increasing your “personal space”, getting more air to breathe and getting a better overview.

Physical presence:

- Being present in encounters
- Being aware of the signals you transmit
- Being able to control reactions and store the emotions triggered by the encounter
- Being able to handle stress
- Being able to take control and make conscious choices
- Being able to improve your health and your relationships
- Being able to ground yourself, genuine, authentic, better self esteem
When stressed we find it more difficult to be present in our bodies, maintain our boundaries and communicate in a clear and respectful manner. It is therefore worthwhile to work on physical presence and utilise our bodies’ knowledge and experiences, together with our thoughts, emotions and driving forces. That way we create better conditions to balance resources and demands by attentively listening to our physical, psychological and emotional signals. We balance activity and rest, change working movements and notice the need to take short breaks depending on the situation. There will be better communication when we take care of ourselves, our energy and our limitations. We will also notice how important it is to find time for physical activity and recovery.

**How to ground your body**

Each encounter with a patient is a challenge, especially if they are worried before an examination or a surgical procedure. How do you treat someone who is stressed? You need to find a way to create a space for your own stress, worries, time constraints, etc. In that way you support the patients to calm themselves, and a common space is created for the emotions. Locked up feelings often give rise to worry and anxiousness. When the surgical procedure is about to start, each member of the team arrives with their own inner state. Take responsibility for grounding your own body and creating the common space needed to accommodate the intensity within the team. Take notice of your body’s concrete signals i.e. the physical sensations you are detecting right now. An example: You have just given the surgeon the sign to enter when you notice your body to be more tense than normal, your shoulders are hunched, your head moves forward and you breathe shallowly. You move around in the O.R., stop and notice your feet. The floor is safe and stable. You put more weight on one foot, which makes the leg on this side more noticeable. Suddenly you are wearing a pair of ‘X-ray specs’ and you see how your skeleton gives you inner support, an upward bearing force. You transfer the weight to your other leg and then back where you started. Now you notice your legs, your pelvis, the support of your spine, the upward bearing force and the downward force of gravity. You see the ‘wires’ that extend your spine up toward the ceiling. You exhale and let go with the force of gravity. Relax your knees and notice both the upward and downward forces. Notice your legs and how your shoulders and jaw muscles are relaxing. The surgeon arrives and everyone gathers in the O.R. As you are conscious and present, you intuitively pick up on the fact that two of your colleagues are showing signs of stress in their bodies, a stress that is quite clearly not your own. You ground yourself again, this time in a standing position. Your physical presence makes it easier for the others to ground themselves, when starting the surgical procedure. Our mirror neurons are a useful resource, but can also impede us.
Physical activity and physical training

One of the most effective ways to prevent and handle stress is to be physically active and exercise. Physical activity refers to all body movements produced by the skeletal musculature and causes energy to be used. Increased physical activity is of great importance when it comes to preventing our most common national illnesses. Physical inactivity is a major risk factor, not least for cardiovascular diseases.

We need 30, preferably 45 to 60, minutes of physical activity each day at a level corresponding to a brisk walk. You can divide the activities over shorter periods, but try to be physically active for at least 30 minutes in total.

Physical training refers to any form of physical activity that is planned, structured, recurring and is aimed at improving or maintaining a certain physical function.

Physical functions include:
- Cardiovascular
- Breathing
- Muscle strength and endurance
- Body composition
- Mobility

Preventative physical training reduces the risk of injuries and illnesses. To reap the full benefit of training, the structures/tissues in the muscles need to be exposed to a greater load than they are used to. Physical training is prescribed instead of medication as a recommended treatment for many lifestyle illnesses such as high blood pressure.
Fitness training

Fitness training means strengthening the heart, blood vessels, breathing, the blood circulation’s capacity to transport oxygen, and the muscles’ ability to utilise this oxygen. The result is that the heart pumps more blood with each heartbeat. The heart muscle becomes stronger and more efficient. For certain jobs the heart will need to exert itself less and in so doing will save energy.

Fitness training is essentially as follows: the higher the intensity, the less time is required. There is however a greater risk of injuries if you train too hard. It is therefore best to vary your training. Select how long and how often you want to train. Read more in the section: ‘Physical training on prescription for people who are healthy but don’t exercise’ under ‘How to make positive changes’. Be aware that it takes between 8 and 12 weeks to increase fitness levels i.e. maximum oxygen uptake capability by about 20%. [39,40]

Strength training

Muscle strength is at its peak between 20 and 30 years of age and remains relatively constant until the age of 40. There is a reduction by 10 to 15% in 10 years from the age of about 50, depending on which muscle is measured. The muscle fibres adapt to the type of training they are exposed to, which is why it is important to match your training with the type of work you perform. Training arm muscles with light weights increases muscle stamina. This is important in order to cope with the load when handling surgical instruments. Strength training with heavy weights does not provide the same effect as that of training with light weights. An increase in strength levels is already noticeable after 4 to 6 weeks due to the interaction between muscles and nerves and improved technique. Read more in the section: ‘Smart on-the-job exercises with resistance band’.
Conclusion

Preventative physical exercise reduces the risk of injuries and illnesses. The challenge you face during surgical procedures is to perform the same job in many different postures to create a variation in movement. This in combination with short breaks will reduce muscular and psychological tiredness.

The psychosocial climate is just as important as the physical environment when it comes to preventing musculoskeletal disorders.

Physical inactivity, insufficient recovery after long work shifts, lack of sleep, incorrect diet and stress all reduce our immunity levels. Remember to drink fluids both when training and in between the surgical procedures. Losing too much fluid reduces performance levels and the risk of injury increases.

Efforts at an individual level are not enough; there is also a need for training efforts at group and organisational level. When ergonomic deficiencies are discovered and these are combined with time constraints, high quality requirements, inadequate internal control and low job satisfaction, the risk of musculoskeletal disorders being incurred is high.

Research indicates that the communication climate in a workplace affects the ability to manage psychological and physical strains. When each member of the team is physically present and emotionally balanced, they support each other. Invest therefore in the entire surgical team. Only then, it is possible to seriously tackle the occurrences of work-related muscular pain conditions and work toward a sustainable working life.
Bibliography and references


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‘Health is feeling well and having enough resources to cope with the demands of the day – and to be able to realise personal goals’
Jan Winroth, Lars-Göran Rydqvist

‘Health is a state of equilibrium, a rhythmic experience that sustains life in an indiscernible manner – Health cannot be divided into body and soul – in somatic or psychological terms – it is a complete state where we encounter our own level of harmony with the world we live in’
Hans-Georg Gadamer

Why are we at Mölnlycke Health Care trying to create awareness about ergonomics in the O.R.?

Staff around the operating table exposes themselves for difficult body postures; leaning toward or across the surgical field to reach, see and manage their work. These strained body postures can result in physical problems. Based on field studies in 2011 Mölnlycke Health Care set off a study around ergonomics in the O.R. and the conclusion is that this very important area does not get the attention it deserves. We have therefore put together this booklet that you hold in your hand.

A big thanks to all that contributed to this and especially to Kerstin Melander, who is the main author of this booklet. We hope this will help increase your awareness around the importance of ergonomics in the O.R. and at the same time give you some interesting reading.

Find out more at www.molnlycke.com

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