Effects on Human Performance
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• The motor control problem - vibration may make it difficult to maintain control over the instrument or tool being used.

• The tactile problem - both short and long term exposure to hand-arm vibration may cause a loss of sensitivity in the fingers and hand.
The motor control problem (1)

- The **proprioceptive system** conveys information about the joint angles. The brain calculates the position in space of the hand or arm.
- The **kinaesthetic system** conveys a sense of motion of the limbs to the brain. This information is necessary for the brain to coordinate motion.
The motor control problem (2)

Because most tasks become more difficult to complete the worker has to devote more mental effort to the task, which in turn:

• Increases the likelihood of accidents and injuries
• Decreases the comfort level experienced by the worker
• Mental fatigue reduces the amount of time that worker can continue to work in such an environment.
Combating the motor control problem (1)

• Avoid or minimize exposure
• Isolate or dampen the vibration
  – Machine side - Changes can be made to the tool or instrument, e.g. adding better grip to tool
  – User side - These interventions can include teaching workers better grips and working positions.
Combating the motor control problem (2)

- Training can improve performance on almost any motor skill.
- Accuracy in a skilled motor task can be improved by increasing the amount of time available to complete the task.
The tactile problem (1)

• The result of prolonged exposure and are most problematic in fine motor activity.
• Typically, tactile problems are most obvious directly after exposure.
The tactile problem (2)

• The loss of sensitivity in the fingers makes it more difficult to make judgments of texture, weight and form of the objects being handled.

• In extreme cases, permanent damage may occur and sensitivity will never return.
Combating the tactile problem

- Eliminating or minimize the exposure
- Ensure proper recovery times.
- Complete as many fine motor movements as possible before using power tools.
- Looking directly at the hands while performing a task can compensate for some sensitivity loss.