

FACTORS AFFECTING PERFORMANCE

Fitness/health

- Stress: domestic & work related
- Time pressure and deadline
- Workload: overload & underload
- Sleep and fatigue, shift work
- Alcohol, medication, drug abuse

Conditions can impact on health and fitness.

Minor physical illness (such as colds, flu, etc.)

- More significant physical illness (such as cancer, heart conditions, etc.)
- Mental illness (such as depression, anxiety, etc.)
- Minor injury (such as a sprained wrist, etc.)
- Major injury (such as a broken arm, etc.)
- Latent Medical and Environmental Conditions (LMECs), deterioration, possibly associated with the aging such as hearing loss, visual defects, obesity, heart problems, etc.)
- Effects of toxins and other foreign substances (such as carbon monoxide poisoning, alcohol, illicit drugs, etc.)

- Ways to maintain health & fitness (meals, exercise, no smoking, no alcohol)

• Eating regular meals and a well-balanced diet;

• Regular exercise (sufficient to double the resting pulse rate for 20 minutes, three times a week is often recommended);

• Stop smoking.

• Sensible alcohol intake.

- Stress characteristics (insidious, not adapting to increasing stress)

Stress is often associated with anxiety, fear, fatigue, and hostility.

Stress is an inevitable and necessary part of life.

Characteristics of stress

- Insidious (develops slowly, gradual and cumulative effect)

- Limited capability to adapt to increasing stress (Stress tolerance)

Causes of stress

- Changes in personal circumstances, such as marital, family leads to stress

- Stressors (physical, psychological, reactive), symptoms (physiological, health effects, behavior, cognitive, subjective effects)

Stressors and the 4 types of symptoms:

1. **Physical** (heat, noise, fatigue)

2. **Psychological** (worries about real or imagined problems)

3. **Reactive**, everyday events (working under time pressure...)

4. **Consequences** for AMT **Poor judgment, accepting lower standards**, inattention, forgetting steps in work, losing things, misreading manuals, loss of time perception, loss of situational awareness

Symptoms of stress

- **Physiological** symptoms, such as sweating, dryness of the mouth etc.

- **Health** effects, such as nausea, headaches, sleep problems, stomach upsets

- **Behavioral** symptoms, such as restlessness, shaking, nervous laughter, taking longer over tasks, etc.

- **Cognitive effects**, such as poor concentration, indecision, forgetfulness etc.

- **Subjective effects**, such as anxiety, irritability, depression, moodiness, aggression etc.

Domestic/Work related stress, examples

• Domestic Stress

- Typically results from major life changes such as divorce, the birth of a child, or the death of a family member or close friend

• Work related Stress

- Carrying out new, very challenging or difficult tasks can make us feel stressed.

- Time pressure, lack of standard procedures or appropriate resources, lack of guidance or supervision

- Stress management, fitness, exercise, sleep, diet, relaxation, stress free environment, task delegation, environmental conditions

- Maintaining good physical fitness and bodily function

- Getting enough sleep to prevent fatigue

- Eating a balanced diet

- Learning and practicing relaxation techniques

- Making work environment stress free

- Delegating tasks and responsibilities to other members of the team

- Paying careful attention to environmental conditions such as heat, humidity, noise, and lighting

Stress coping strategies

- 1, Achieving relaxation, such as breathing
- 2, exercises, praying,
- 3, seeking professional help **therapee**

Stress measuring, Table 4-1 pg. 4.6

Average score 250, >300 alarming

- Time pressure, types, management

Pressure Two types:

1, **ACTUAL PRESSURE**, applied directly or indirectly, for the task to be completed in a given time.

2, **SELF IMPOSED PRESSURE**, to complete a task within a given time, even when the time available may be unrealistic

• Need to manage pressure:

1, Allocate appropriate time for all maintenance tasks

2, Carry out a comprehensive pre-task briefing to outline the task priorities

3, Ensure open two way communication to identify and mitigate the effects of pressure on performance and behavior

4, Ask for help, particularly when the task requirement is outside your expertise and/or capabilities

5, Communicate the ramifications of any unusual or unexpected results

6, Not deviate from procedures or take short cuts because of time pressure

7, Just do what you can

- Shift work, responsibilities of employee/employer.

In shift and task hand overs

Managing hand overs and shift changes is required:

1, Planning appropriately and communicating

2, Allow adequate time for all tasks

3, Comprehensive written shift handover log to be completed.

- Workload, overload, underload

Workload is a relatively subjective measure (experienced differently by different people) and is affected by:

- 1, The nature of the task, such as its physical and mental demands
- 2, The circumstances under which the task is performed: the standard of performance required, the time available to accomplish the task and the prevailing environmental factors
- 3, The individual and their situation: their skills both physical and mental; their experience, familiarity with the task; their health and fitness levels; and their emotional state.

Work overload occurs when there is a lot of work to be done and the individual's or team's workload exceeds their ability to cope. The affects:

- 1, Errors rates may increase
- 2, Omission and Filtering -> Ignoring signals or responsibilities
- 3, Reduced ability to think logically -> Limited capability for information processing
- 4, Queuing -> Delaying actions/responses
- 5, Confirmation Bias -> Confirm decision made, ignoring information
- 6, Approximation -> Near enough is good enough
- 7, Regression -> Revert to previous action not appropriate

Work Underload

Can result from menial, simple or very repetitive tasks that are boring, or indeed from a lack of tasks to do.

Less attentive, boredom and thinking other things -> Situational awareness degraded and errors/omissions increase

- Sleep, fatigue, types of fatigue, fatigue effects (attention, memory, mood, reaction time)

Fatigue what does it mean:

- 1, tiredness after hard physical work
- 2, Emotion fatigue
- 3, short term effects of intense concentration on a task
- 4, An overwhelming need to sleep

We can distinguish **between two types of sleep related fatigue:**

- 1, Acute – this is generally only short term and can be remedied with a good night sleep
- 2, chronic – a long term problem as there is usually a buildup of sleep deprivation

| EFFECTS OF FATIGUE | |
|---------------------------------|---|
| PERFORMANCE CATEGORY | EFFECTS |
| Attention: Reduced | Leave out steps in tasks. |
| | Preoccupation with single tasks or steps. |
| | Tunnel vision, less likely to notice the unexpected. |
| | Less aware or poor performance. |
| | Concentration requires more effort. |
| Memory: Diminished | Poor memory for tasks completed or underway. |
| | Forget to perform task steps. |
| | Revert to 'old habits'. |
| | More likely to forget to return to interrupted tasks. |
| Mood: Withdrawn | Reduced communication. |
| | More irritable, frustrated by minor difficulties. |
| | Temptation to shortcut tasks. |
| Reaction Time: Increased | Slower to notice problems. |
| | Less smooth control of equipment or vehicles. |

- Sleep related medical conditions (insomnia, RLS, PLM, sleep apnea), what they are

1, **insomnia**: an inability to go to sleep or difficulty staying asleep.

What causes insomnia: symptom of another problem such as medical condition, side effects of medicines, or sleep disorders, insomnia can also be caused by worry or emotional upsets

2, **restless legs syndrome RLS**: a disorder that cause a strong urge to move your legs.

The causes: this urge occurs with Strang and unpleasant feeling such as creeping , tingling or burning. Moving your leg relives the urge and the unpleasant feeling.

3, **periodic limb movement (PLM)**: involuntary leg movement while asleep

The movement often disrupt sleep and may cause the person to wake up

4, **sleep apnea**: disorder in which breathing pauses or become shallow during sleep.

- Circadian rhythms, WOCL, how deal with WOCL, factors for fatigue (light, activities, room temperature), strategies to deal with fatigue

Our bodies have very steady 24-hour rhythms in their physiology, biochemistry and behavior. Alertness, body temperature, sleep tendency, and human error have also been shown to follow a 24-hour pattern. This is known as circadian rhythms.

Beware the WOCL!

The period from around 2am–5am when we would normally be asleep is often referred to as the Window of Circadian Low (WOCL)

and is a time when mental functioning is generally at its worst. The WOCL is a high-risk time for human error. Even people without a sleep debt find that their work performance is affected by fatigue during the WOCL, but a sleep debt will intensify the negative effects of the WOCL.

Tips for dealing with the WOCL: 2–5am

how deal with WOCL

- If possible, avoid the most safety critical tasks during the WOCL
- If you can, keep the lights bright and the temperature slightly cool
- Try to avoid monotonous or tedious tasks
- Ask someone to check your work
- Stretch, walk around. Get some fresh air.
- If you can, take a brief nap. Even a few minutes will help.
- Use caffeine carefully, and be aware that it may make it more difficult to sleep when you get home.
 - factors for fatigue (light, activities, room temperature), strategies to deal with fatigue

Factors increasing impact of fatigue:

1, Low light: A work environment with low illumination reduces alertness and makes it harder for a fatigued person to fight the urge to sleep

2, Passive activities: Tasks which are boring, do not involve physical activity. Tasks requiring continuous monitoring or long tedious inspections.

3, Warm temperature: A fatigued person will find it harder to stay alert in warm environment.

Responsibilities of Employer:

Proper schedule work hours and time off, manage workload and breaks.

- Shift work, responsibilities of employee/employer

Manage personal time, for incidents note if fatigue is contributing factor

Strategies to deal with fatigue:

- Get more Sleep
- Controlled Naps, preventive nap, restorative nap
- Caffeine
- Breaks
- Progressive Restrictions, less critical tasks to fatigued AMT's

- Advantages/disadvantages of shift work

Advantages:

- More days off
- Avoiding peak traffic times when traveling to work.

Disadvantages:

- Working 'unsociable hours', meaning that time available with friends and family will be disrupted.
- Working when human performance is known to be poorer (i.e. between 4am and 6am);
- Problems associated with disturbance of the body's various rhythms (principally sleeping patterns)

Rolling Shift Patterns

- Body's internal clock not immediately reset
- Shift rotation to later shifts (Early Shift -> Late Shift -> Night Shift or Day Shift -> Night Shift) instead of rotation towards earlier shifts.