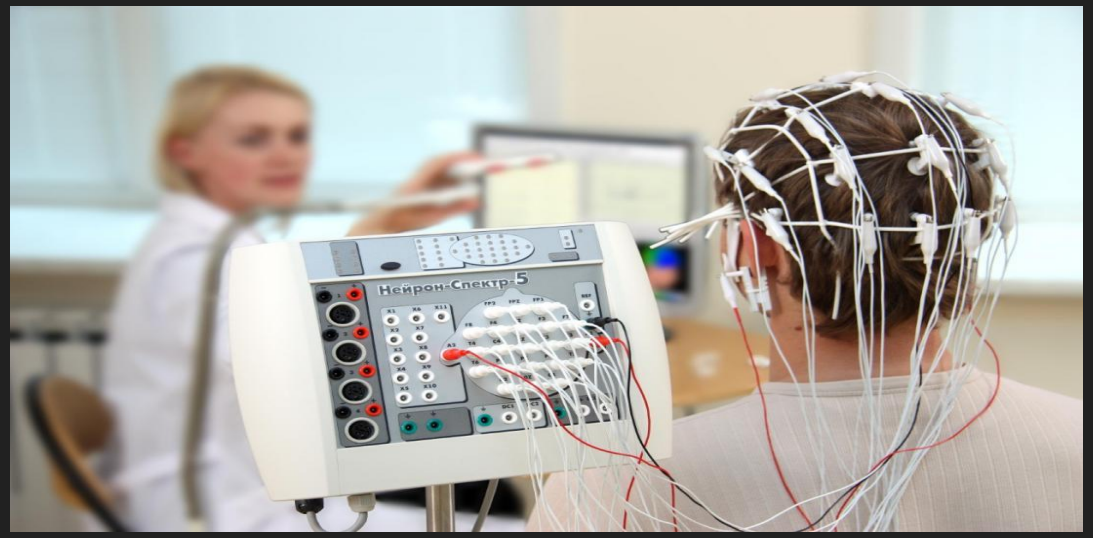
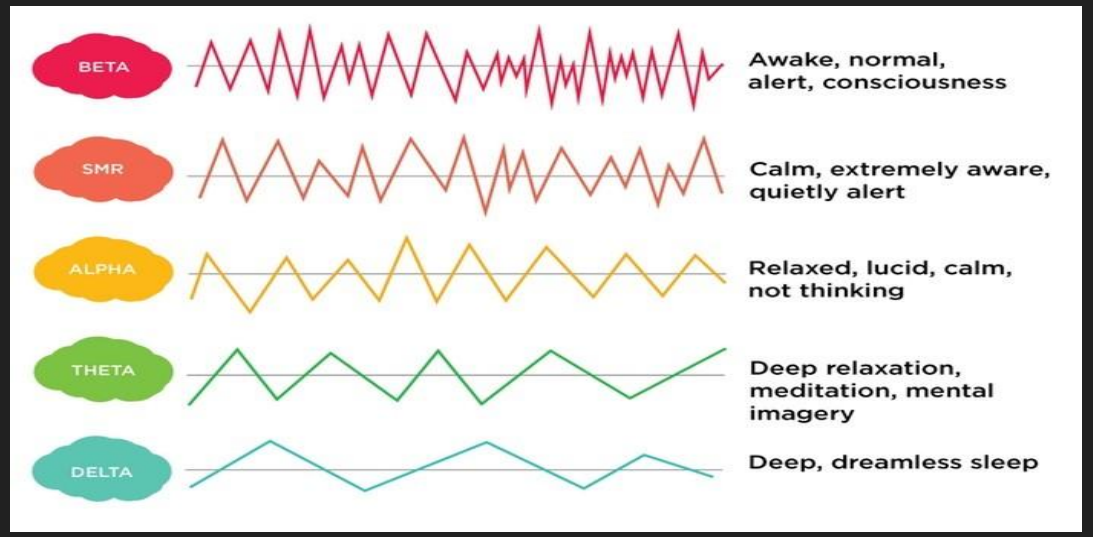
SLEEP AND DISORDER OF SLEEP

SLEEP

Good sleep is necessary for optimal health and can affect hormone levels, mood and weight.

Measurement of the sleep





Electroencephalogram- For recording of the brain waves. sleep pattern shows the rhythmic pattern, high frequency shows that individual is active and slow frequency shows deactivation.

Types of Sleep

Non- Rapid Eye Movement or Non- REM Sleep-

- deep sleep
- less sensory processing
- very slow eye ball movement
- low heart rate and breath rate
- low blood pressure

Rapid Eye Movement or REM Sleep-

- high movement in eye ball
- heart rate and breathing rate high and irregular
- 20 % is of normal sleep
- dream sleep
- dreams characteristics- illogical and nature is emotional

Anatomy of Sleep

Hypothalamus- it acts as a control centre affecting sleep and arousal. also contains Suprachiasmatic nucleus

Brain Stem- Brain chemical- GABA which acts to reduce the activity of arousal centres in hypothalamus and the brain stem
Pons and Medulla- special role in REM sleep

Thalamus- acts as a relay for information from the senses to the cerebral cortex. it is active during REM sleep

Pineal Gland- Melatonin which helps put us to sleep once the lights go down

Basal Forebrain- also promotes sleep and wakefulness. while part of the midbrain acts as an arousal system. Adenosine- sleep drive support

Reticular Formation- it is the activating system of the brain. when because of the fatigue and sleep toxin accumulates the system fades and person feels sleepy.

- Usually sleepers pass through four stages: 1, 2, 3, and REM (rapid eye movement) sleep. These stages progress cyclically from 1 through REM then begin again with stage 1.
- A complete sleep cycle takes an average of 90 to 110 minutes, with each stage lasting between 5 to 15 minutes.
- The first sleep cycles each night have relatively short REM sleeps and long periods of deep sleep but later in the night, REM periods lengthen and deep sleep time decreases.

STAGES OF SLEEP

- There are **four stages of sleep**: Non-REM (NREM) sleep (Stages 1, 2 & 3) and REM sleep.
- Periods of wakefulness occur before and intermittently throughout the various sleep stages or as one shifts sleeping position.
- Wake is the period when brain wave activity is at its highest and muscle tone is active.

STAGES OF SLEEP

- **Stage 1 is the lightest stage of NREM sleep**.
- Often defined by the presence of slow eye movements, this drowsy sleep stage can be easily disrupted causing awakenings or arousals.
- Muscle tone throughout the body relaxes and brain wave activity begins to slow from that of wake.
- Occasionally people may experience hypnic jerks or abrupt muscle spasms and may even experience sensation of falling while drifting in and out of Stage 1.
- Waves are alpha waves- 8-12 cycles per second.
- after this theta waves are there with 2-7 cycles per second.

STAGES OF SLEEP

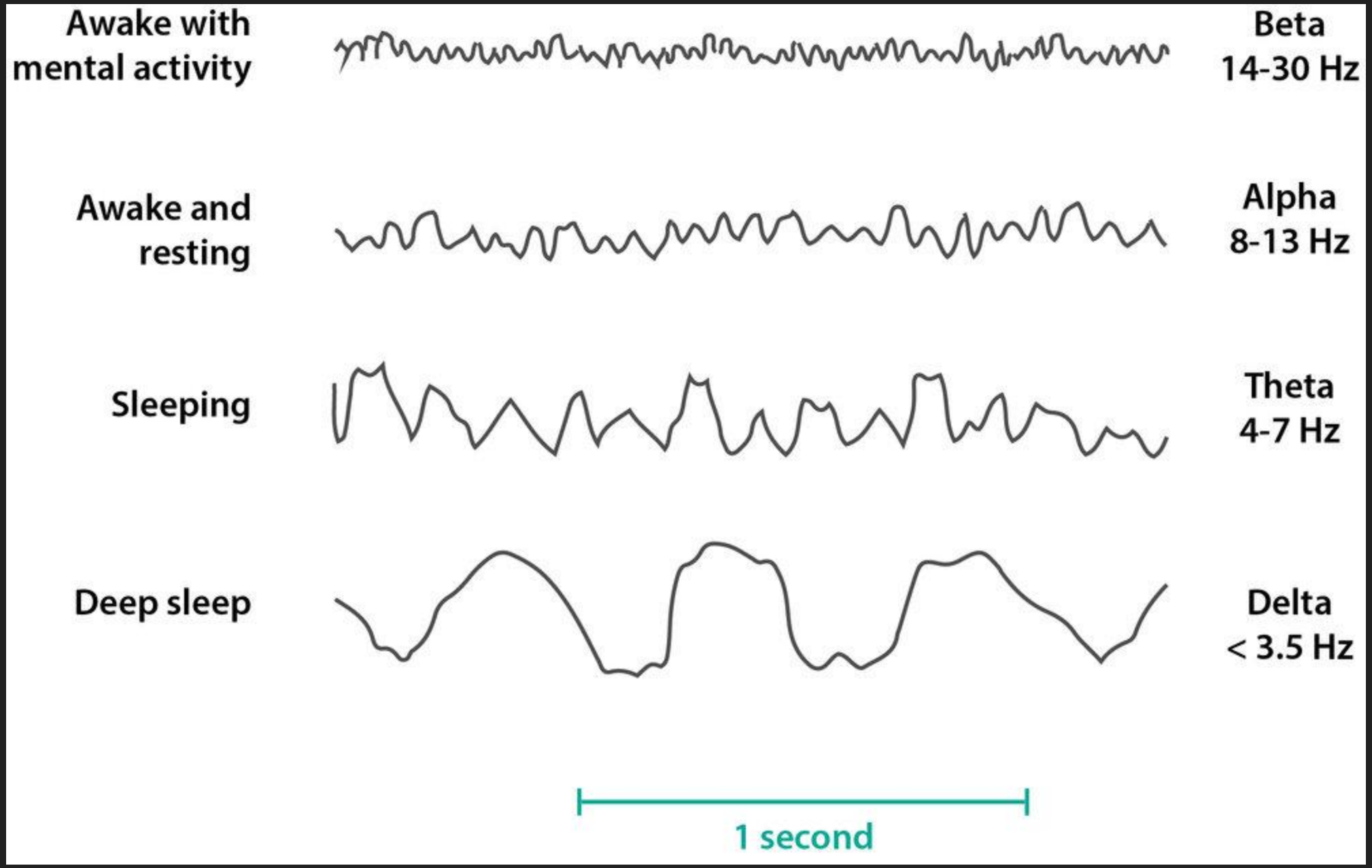
- **Stage 2 is the first actual stage of defined NREM sleep**.
- Awakenings or arousals do not occur as easily as in Stage 1 sleep and the slow moving eye rolls discontinue.
- Brain waves continue to slow with specific bursts of rapid activity known as sleep spindles intermixed with sleep structures known as **K complexes**.
- Both sleep spindles and K complexes are thought to serve as protection for the brain from awakening from sleep. Body temperature begins to decrease and heart rate begins to slow.

STAGES OF SLEEP

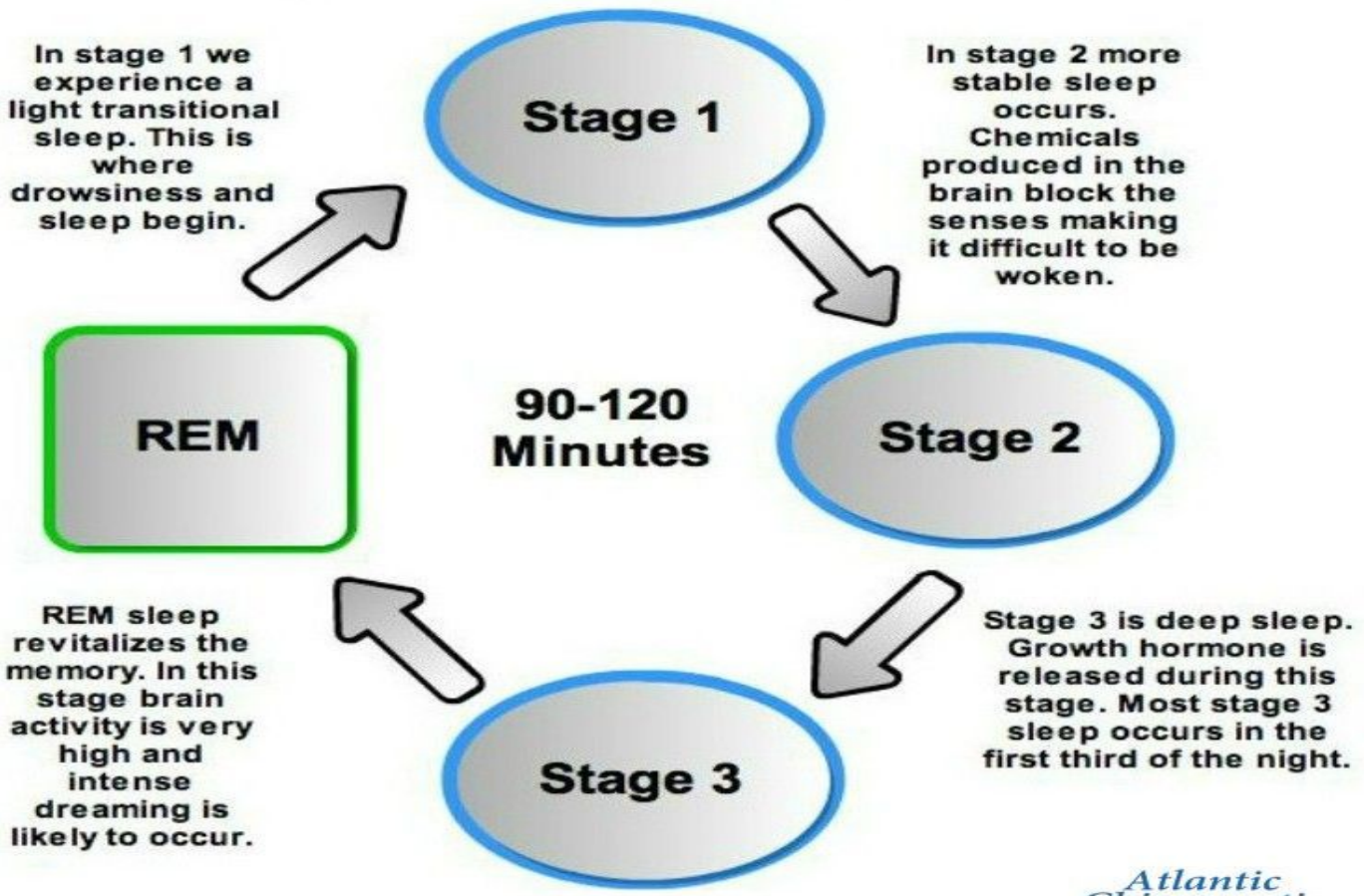
- **Stage 3 is known as deep NREM sleep**.
- The most restorative stage of sleep, stage 3 consists of **delta waves or slow waves- 1- 2 cycles per second.**
- Awakenings or arousals are rare and often it is difficult to awaken someone in Stage 3 sleep.
- Parasomnias (sleepwalking, sleep talking or somniloquy and night terrors) occur during the deepest stage of sleep.

STAGES OF SLEEP

- **REM sleep, also known as rapid eye movement, is most commonly known as the dreaming stage.**
- Eye movements are rapid, moving from side to side and brain waves are more active than in Stages 2 & 3 of sleep.
- Awakenings and arousals can occur more easily in REM; being woken during a REM period can leave one feeling groggy or overly sleepy.


Awake with mental activity
Beta 14-30 Hz
Awake and resting
Alpha 8-13 Hz
Sleeping
Theta 4-7 Hz
Deep sleep
Delta < 3.5 Hz
1 second

Different Stages Of Sleep



Atlantic Chiropractic

SLEEP CYCLE

- A sleep cycle is the progression through the various stages of NREM sleep to REM sleep before beginning the progression again with NREM sleep.
- Typically, a person would begin a sleep cycle every 90-120 minutes resulting in four to five cycles per sleep time, or hours spent asleep.
- One does not go straight from deep sleep to REM sleep, however. Rather, a sleep cycle progress through the stages of non-REM sleep from light to deep sleep, then reverse back from deep sleep to light sleep, ending with time in REM sleep before starting over in light sleep again.

DEEP SLEEP

- Deep sleep occurs in Stage 3 of NREM sleep. Brain waves during Stage 3 are called delta waves due to the slow speed and large amplitude. Of all of the sleep stages, Stage 3 is the most restorative and the sleep stage least likely to be affected by external stimuli.
- Deep sleep reduces your sleep drive, and provides the most restorative sleep of all the sleep stages. This is why if you take a short nap during the day, you're still able to fall asleep at night. But if you take a nap long enough to fall into deep sleep, you have more difficulty falling asleep at night because you reduce your need for sleep.

DEEP SLEEP

- During deep sleep, human growth hormone is released and restores your body and muscles from the stresses of the day. Your immune system also restores itself. Much less is known about deep sleep than REM sleep. It may be during this stage that the brain also refreshes itself for new learning the following day.

Theories of Sleep

Recuperative Theory

Repair Theory

Ecological Theory

SLEEP DISORDERS

- Causes: High levels of stress; certain medications; anxiety or depression. Drugs or alcohol abuse.
- Symptoms: Difficulty falling asleep and then maintaining that sleep. While everyone has a bad night of sleep every so often, insomnia is a chronic issue, not acute.
- Treatment: Cognitive behavioral therapy and/or medication are often prescribed.

INSOMNIA

Causes: A complete or partial blockage of the throat.

Symptoms: Daytime sleepiness, morning headaches, and—as any person who has attempted to sleep beside someone with apnea can attest—excessively loud snoring. Apnea may cause you to stop breathing multiple times per night. Oddly enough, most people who have apnea don’t realize there’s a problem until someone tells them.

Treatment: The most common treatment for apnea is a CPAP (continuous positive airway pressure) machine, which keeps a person’s throat open via a steady stream of air.

SLEEP APNEA

- Causes: Experts aren’t sure what causes RLS, but theorize that it’s hereditary. Medications have also been known to cause RLS. Pregnant women sometimes suffer from RLS.
- Symptoms: An irresistible urge to move the limbs, not just legs. Often occurs in the evening or during periods of rest. Neubauer says that those who have RLS can kick or move hundreds of times a night, every single night.
- Treatment: Regular exercise; reduction in caffeine and alcohol. For severe cases, medication can be prescribed.

RESTLESS LEG SYNDROME

- Causes: Abnormalities in the parts of the brain that control REM sleep.
- Symptoms: While people with narcolepsy can suddenly fall asleep at the most inopportune moments, most spend their days in a weird middle ground of sleep.
- Treatment: Medication is often advised.

NARCOLEPSY

- Causes: Lack of sleep or inefficient sleep. Some medications. Illness or fever.
- Symptoms: Walking while sleeping. Talking while sleeping
- Treatment: Reducing liquids near bedtime. A quiet sleep environment and maintaining a regular sleep schedule.

SLEEPWALKING/ SOMNAMBULISM
SLEEP TALKING

Causes- scary movies, book, illness or fever, medications, drug or alcohol abuse, physical or mental illness.

Treatment- exercising, limit the amount of alcohol and caffeine, relaxation techniques,

NIGHTMARE

Causes- shift work, meeting deadlines, sleeping environment nor proper, using electronic devices close to bedtime, medical problems such as depression, sleep apnea, or chronic pain, caring for another person during the night.

Symptoms- Fatigue. irritability, mood changes, difficulty focusing and remembering, a reduced sex drive

Treatment- Behavioral and cognitive Treatments- Relaxation techniques, Cognitive Behavioral therapy. Medications

SLEEP DEPRIVATION EFFECT

- Causes: Sleep deprivation, illness and/or, some medications.
- Symptoms: Screaming and violent, short bursts of movement during sleep. When a person has a sleep terror episode they aren’t fully awake, therefore it can be extremely difficult to calm them down once they do wake up.
- Treatment: Improve sleep environment, medication is given if the terrors are extreme.

SLEEP TERRORS

- Causes: Most experts blame excessive stress and anxiety.
- Symptoms: Headaches and/or a sore jaw when waking in the morning. Complaints from annoyed bedmates.
- Treatment: Avoiding chewing any items that aren’t food, as it trains the jaw to clench. Most people with bruxism end up getting fitted with a mouth guard that can be provided by a dentist.

BRUXISM (TEETH GRINDING)

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