Definition: Interferential Current Interferential current is a type of electrical stimulating current that overcome the problem of poor penetration encountered by low frequency currents.It has advantage over faradic current stimulation that faradic currents can only stimulate voluntary components.The exact frequency of the resultant beat frequency can be controlled by the input frequencies e.g., if one current was at 4000 HZ and its companion current at 3900 HZ, the resultant beat frequency would be at 100 HZ. Physics of IF current: The basic principle of Interferential Therapy is to produce low frequency electrical stimulation of the muscle and nerve (less than 250 Hz) without the associated unpleasant sensation of the low frequency stimulation.Pain Control: High beat frequencies, about 100 Hz, when accompanied by sensory-level stimulation, activate the spinal gate, inhibiting the transmission of noxious impulses.Carbon-rubber electrodes in different Suction electrodes shapes Electrodes placement: Quadripolar Technique The four electrodes are positioned around the painful area so that each channel runs perpendicular to the other and the current crosses at the midpoint.Bipolar Electrode Placement When IFS is applied using a bipolar technique, the mixing of the two channels occurs within the generator rather than in the tissues.These two effects will encourage the reabsorption of tissue fluid and milking of the venous and lymphatic return through electrically evoked contraction.The resulting interference currents are in a range that allows effective stimulation of deeper tissues than other forms of electrical stimulation with relatively little patient discomfort.- Frequency: the current frequency is about 4000 Hz but beat frequency is dependent on the desired effect; a. Sensory nerves: 90 – 100 Hz. b. Motor nerves: 1 – 50 Hz. c. Smooth muscle fibers: 0 – 10 Hz. - Intensity: The current intensity is typically in the range of 0 – 100 mA which is dependent on the desired effect (sensory or motor stimulation).Sweep patterns; a) triangular pattern, b) rectangular pattern and c) trapezoidal pattern Physiological effect: The main clinical applications of IFT are: a. Painrelief.a. Stimulationatlowfrequencyof1-30Hzwillresultina series of twitches (the most effective motor stimulation frequency is 10-25 Hz) b. Stimulation at 50 Hz or more will result in a tetanic contraction.Two electrodes were placed on the lower abdomen just above the outer half of the inguinal ligament and another two on the inner aspect of thigh near to the origin of adductor muscle.At low frequencies a twitch is produced, between 5 and 20 Hz a partial tetany and 30 to 100 Hz tetanic contraction occurs.It is claimed that the rapid return of the tone of pelvic floor muscles occurs when treated with interferential therapy due to stimulation of both voluntary and smooth muscle fibers.It utilizes two medium frequency currents (generated from two different circuits), passed through the tissues simultaneously.Increasing the frequency to 4000 Hz reduces capacitive skin resistance to approximately 40 ohms.Consequently, IFS encounter less skin resistance and can pass to deeper tissues with using less current intensity than other low-frequency forms of stimulation.- Frequency Sweep: accommodation is a characteristic feature of the excitable tissues (nerves and muscles) if they are stimulated using fixed frequency.Low beat frequencies of 2 to 10 Hz, applied at the motor level, should initiate the release of opiates and result in a narcotic-like pain reduction.The medium frequency carrier currents penetrate the tissues with very little resistance.An AC of 50 Hz encounters approximately 3000 ohms of resistance per 100 cm2 of skin.Parameters of Interferential current: - Waveform: biphasic symmetric balanced sine wave.c. Surged .stimulation mode might be advantageous in reducing fatigue.d. Reduction of edema.2.3