List of Figures

Chapter IIA

Figure A: Structures of the mouth and oropharynx. (Ref: edoctoronline.com)

Figure B: Incidence of Various cancers in Males and Females in India

Figure C: Incidence of region vise distribution of Head and Neck cancers in India

Figure D: Regional distribution of Head and Neck cancers

Chapter IIB

Figure E: Risk of developing oral mucositis according to type of anticancer treatment

Figure F: Five phase model of pathobiology of mucositis

Figure G: Up-regulation and generation of messenger signals phase 1

Figure H: Up-regulation and generation of messenger signals phase 2

Figure I: Signaling and amplification phase

Figure J: Ulceration phase

Chapter IIC

Figure K: Principal components of LASER

Figure L: Helium Neon LASER

Figure M: Schematic diagram of Semiconductor Laser

Figure N: Mechanism of Helium-Neon Laser production

Figure O: Laser light showing Laser Speckle and light of a Fluorescent Lamp

Figure P: Schematic diagram showing the absorption of red and near infrared light by specific cellular chromophores or photo-acceptors localized in the mitochondrial respiratory chain.

Figure Q: Therapeutic window of LASER
**Figure R:** Absorption spectra of the main chromophores in living tissue on a log scale showing the optical window where visible and NIR light can penetrate deepest into tissue.

**Figure S:** Mitochondrial respiratory chain consisting of contains five complexes of integral membrane proteins: NADH dehydrogenase (Complex I), succinate dehydrogenase (Complex II), cytochrome c reductase (Complex III), cytochrome c oxidase (Complex IV), and ATP synthase (Complex V).

**Figure T:** When NO is released from its binding to heme iron and copper centers in cytochrome c oxidase by the action of light, oxygen is allowed to rebind to these sites and respiration is restored to its former level leading to increased ATP synthesis.

**Figure U:** Reactive oxygen species (ROS) formed as a result of LLLT effects in mitochondria may activate the redox-sensitive transcription factor NF-κB (relA-p50) via protein kinase D (PKD).

**Figure V:** The downstream cellular effects of LLLT signaling include increases in cell proliferation, migration and adhesion molecules. Cell survival is increased and cell death reduced by expression of proteins that inhibit apoptosis.

**Figure W:** Beneficial tissue effects of LLLT can include almost all the tissues and organs of the body.

**Chapter III**

**Figure 1:** Linear accelerator employed for radiotherapy (ELECKTA: Precise Treatment System 1500)

**Figure 2:** Instruments used for delivering Low Level Laser therapy

**Figure 3:** Anatomical sites Irradiated with Low level laser therapy

**Figure 4:** Images of sites treated with LLLT
Figure 5: Flow of participants through the study

Chapter IV

Figure 6: Incidence of severe mucositis (grades >2) between Laser and Placebo group

Figure 7: Pain (VAS) scores between Laser and Placebo group

Figure 8: Incidence of Severe to Worst pain between Laser and Placebo group

Figure 9: Supplement Analgesics Need between Laser and Placebo groups

Figure 10: Incidence of Total Parenteral Nutrition between Laser and Placebo group

Figure 11: Weight Loss between Laser and Placebo groups

Figure 12: Progression of OMWQ-HN mean scores between laser and placebo group

Figure 13: Incidence of Severe MTS during CCRT between Laser and Placebo group

Figure 14: Physical well-being Scores between laser and placebo group

Figure 15: Emotional well-being Scores between laser and placebo group

Figure 16: Functional well-being Scores between laser and placebo group

Figure 17: Head and Neck Specific Scores between laser and placebo group

Figure 18: Incidence of Radiation breaks between Laser and Placebo Group

Figure 19: Incidence of Severe Grade Oral mucositis in Laser and Placebo Group