

CURRICULUM AND SYLLABUS
FOR
TWO YEARS POST GRADUATE FELLOWSHIP PROGRAMME IN HEAD & NECK ONCOLOGY

Offered by

DR. B. BOROOAH CANCER INSTITUTE
GUWAHATI

Affiliated to

SRIMANTA SANKARDEVA UNIVERSITY OF HEALTH SCIENCES
ASSAM

Name of the specialty : **TWO YEARS FELLOWSHIP PROGRAMME
IN HEAD & NECK ONCOLOGY**

Duration : Two Years (24 months)

Number of seats : 1 (one) per batch

Requisite Qualification : MS / DNB in ENT, or GENERAL SURGERY and MDS in
MAXILLOFACIAL SURGERY

Name of the experts : Dr. A. C. Katak, MD, Director, BCCI
Dr. A. Kr Das, M.S., BCCI
Dr. T. Rahman, MS, BCCI
Dr. R. J. Das, MS, BCCI
Dr. S. K. Medhi, MS, BCCI
Dr. K. Das, MS, BCCI
Dr. N. K. Kalita, M.D., BCCI
Dr. A. K. Kalita, M.D., BCCI
Dr. M. Bhattacharyya, MD, BCCI
Dr. Vikas Jagtap, MD, BCCI
Dr. B. K. Das, M.S., BCCI
Dr. J. Purkayastha, M.S. BCCI
Dr. B. B. Borthakur, M.S. BCCI
Dr. Abhijit Talukdar, M.S. BCCI
Dr. J. Dev Sharma, M.D., BCCI
Dr. Anupam Sarma, M.D., BCCI
Dr. C. Bhuyan, M.D., BCCI
Dr. B. J. Saikia, M.D., BCCI
Dr. M. Hazarika, M.D., BCCI
Dr. U. Bhuyan, M.D., M.Sc., BCCI
Dr. B. K. Choudhury, M.D. BCCI
Dr. S. M. Bhagabaty, M.D., BCCI
Dr. R. Begum, M.D., BCCI
Dr. Arun Deka, M.D., BCCI
Dr. Anupam Das, M.D., BCCI
Dr. K. Bhagabaty, M.B.B.S, Dip.Pal.Med., BCCI
Mr. Shachindra Goswami, MSc., DRP, BCCI
Ms. Mithu Borthakur, M.Sc., DRP, BCCI
Dr. A.K. Biswas, Speech Therapist, GMCH

Visiting Faculties:

- a) *Dr A. K. Adhyapok, MDS*
Principal and HOD, Dept. of Oral & Maxillofacial Surgery
Regional Dental College, Guwahati.
- b) *Dr Rup Jyoti Hazarika, MS(Gen Surg), Mch(Neuro)*
Associate Prof. Dept. of Neurosurgery
Guwahati Medical College, Guwahati.
- c) *Dr Jadunath Buragohain, MS(ENT), Mch(Oncosurgery)*
Assistant Prof. Dept. of Oncosurgery
Guwahati Medical College, Guwahati.
- d) *Dr Bhaskar Bokotoki, MS(Gen Surg), MCh(Plastic)*
Consultant Plastic Surgeon, Dispur Hospital, Guwahati.

Contact details (BBCI)

Tel: 0361-2472366 / 364; Fax: 0361-2472636;
E-mail: bbcinfo@yahoo.co.in /
adas171@yahoo.co.in
Website: bbcionline.org

1. Goal

To train an MS in ENT/ General Surgery, or MDS in Oral & Maxillofacial Surgery, to be a Head & Neck Oncologist.

A *Head & Neck Surgeon* is a specialist in ENT/General Surgery/ Oral & Maxillofacial Surgery, who has completed a formal two year of fellowship / training programme in Head & Neck Surgery and has been assessed as being competent in the comprehensive management of patients with Head & Neck cancers i.e. prevention, early detection, diagnosis and therapeutic procedures, research and all effective forms of cancer therapy – curative, palliative, pain relief, and the total care of the patient's Head & Neck cancer or complications resulting there from.

NEED FOR THE TRAINING PROGRAMME

- To improve the knowledge, practice and skills of those specialists treating patients with head & neck malignancy, in view of the prevalence of head and neck cancer in India and Indian subcontinent.
- To promote research into the management of these diseases.
- To improve the teaching and training about these diseases.
- To improve the outcome for patients with head & neck cancer.
- To ensure that patient with head & neck cancer receive the highest standards of care.
- To ensure that patient with head & neck cancer have access to specialist care in the management of their disease.
- To promote close understanding and a working relationship with other relevant disciplines whose input will contribute to improved survival of the patient with head & neck cancer.
- To promote the concept of review and audit which contribute to good medical practice.
- To promote and strengthen preventive health care through screening and early detection of oral cancers.

2. Objectives

At the end of the training programme the candidate should:

- i) Be able to function as an independent consultant clinician in head & neck oncology.
- ii) Have an understanding of the aetiology, epidemiology, screening, detection and prevention of head & neck malignancy.
- iii) Acquire the necessary knowledge and skill to perform radical operations of Oral, Oropharyngeal, Hypopharyngeal, Laryngeal, Skullbase tumors, and metastatic lymphnodes in the neck and the principles of surgery of reconstructive techniques for the restoration of function and of the oral cavity, larynx and hypopharynx, as required in the management of head & neck cancer and its complications.
- iv) Must acquire in the principles of a wide range of investigative procedures – including direct laryngoscopy, upper G.I. endoscopy, bronchoscopy, nasal endoscopy and the placement and care of central intravenous lines. A detailed knowledge of relevant ultrasound, CT scan, MRI, PET and other organ imaging techniques including lymphangiography must be developed.
- v) Have a sound knowledge of parenteral nutrition and intensive care management of the perioperative patient.
- vi) Develop skills in the management of pain relief and the care of the terminally ill patient.
- vii) Be well informed in the methods and techniques of radiation treatment, including brachytherapy, external and radioisotope therapy. The candidate must be capable of participating in the planning of radiation treatment and must acquire an understanding of the principles of radiobiology and radiation physics. The candidate must develop skill in the management of the side effects and complications of radiotherapy.
- viii) Acquire an advanced knowledge in the clinical pharmacology of cancer chemotherapy and related treatment modalities. He /she should develop skills in the selection of patients for chemotherapy and the detailed practical use of the different drugs used in the management of head & neck malignancies. The candidate should develop skills in the management of toxic side effects and acquire a wide knowledge of the use of these agents, sufficient to administer them in an independent capacity.
- ix) Develop a high level of skill in the assessment of the effects of treatment and the care of complications. This includes skill in the assessment of the patient after treatment as well as skill in planning long-term management.
- x) Acquire a high level of skill in oral cancer screening

- xi) Develop a sound knowledge of gross and microscopic pathology and cytology relevant to head & neck cancer. This knowledge must be sufficient for the candidate to interpret the details of reports concerning the histopathology of head & neck malignant disease and to use pathological findings, effectively in making decisions regarding treatment and prognosis.
- xii) Develop a sound knowledge of rehabilitation, physiotherapy, swallowing and speech therapy, different dental and maxillary prosthesis.
- xiii) Develop skills in the planning, conduct and reporting of research in head & neck oncology. The candidate in addition, must develop a high level of skill in the interpretation and evaluation of research reports and understand the principles of ethics in research and good clinical practices.
- xiv) Be capable of discipline and remain acquainted with the current literature on relevant aspects of basic, investigative and clinical head & neck oncology.
- xv) Have an understanding of the psycho-socio-economic-cultural aspects of head & neck oncology, especially in the Indian context.

3. **Posting schedule:**

- a) Participation in the work of a head & neck surgery department for at least 16 months. During this period, the Institute will explore the possibilities for 4 weeks placement at a reputed cancer centre in the country.
- b) Participation in the work of a general surgery / surgical oncology department particularly in the areas of thoracic surgery for at least four weeks.
- c) Participation in the work (both outpatient and in-patient) of medical oncology department for at least four weeks;
- d) Participation as a member of a team planning radiotherapy and performing radiation treatment for at least four weeks;
- e) Participation in the work of the intensive care unit for at least two week;
- f) Participation in the work of a histopathology and cytology department for at least six weeks;
- g) Participation in the work of a molecular biology department/laboratory for at least two weeks;

- h) Participation in the work of the radio imaging and nuclear medicine departments for at least two weeks;
- i) Participation in the work of the department of anaesthesiology for at least two week;
- j) Participation in the work of the department of palliative medicine pain relief and home care for at least two weeks;
- k) Participation in community based cancer screening and early detection program for at least two weeks.
- l) Participation in the physiotherapy and speech & swallowing rehabilitation for at least two weeks

The course should also include as part of the training wherever possible:

- i. cadaver dissection for surgical anatomy.
- ii. participation in clinical research trials as co investigator

4. *Theory topics which should be covered for the Fellowship Programme*

4.1 *EPIDEMIOLOGY AND AETIOLOGY OF HEAD & NECK CANCERS*

The candidate should be able to explain the relationship between each of the following factors and carcinogenesis.

- (a) Environmental Factors including tobacco
- (b) Virus: Relationship of EBV, HPV, other viruses and malignancy.
- (c) Radiation induced malignancies
- (f) Familial patterns in malignancies e.g. thyroid cancer

4.2 *SURGICAL ANATOMY*

The candidate should be able to describe

- (a) The relevant anatomy and histology and blood supply & lymphatics to
 - Oral cavity
 - Oropharynx
 - Nasopharynx
 - Nose and PNS
 - Larynx & Hypopharynx
 - Neck
 - Skull base
 - Chest

- Upper and lower limb
- Orbit
- Scalp
- Ear
- Face
- Thorax
- Trachea & Lung
- Abdomen (stomach)

4.3 **GENETICS & MOLECULAR BIOLOGY**

The candidate should be able to describe:

- (a) The chromosome and DNA changes associated with head and neck cancer.
- (b) Different receptors
- (c) The laboratory and clinical evidence to support genetic role in the development of head and neck cancer.
 - i. Chromosome abnormalities in premalignant conditions
 - ii. Chromosome abnormalities and oncogenes.
- (e) Molecular genetics
 - a. DNA changes due to carcinogens
 - b. Viral transforming genes
 - c. Oncogenes and cell transfections
- (f) The role of oncogenes in the development of head and neck cancer.
 - a. Properties of oncogenes/proto-oncogenes and their products
 - b. Mechanisms of oncogene activation
 - c. Specific families of oncogene proteins
 - Nuclear oncogene / proto-oncogene proteins
 - Relationship between growth factors and oncogenes
- (d) The principles of the molecular biology techniques which are used in cancer research e.g. DNA hybridization.

4.4. PREVENTION AND SCREENING OF HEAD & NECK CANCERS

The candidate should be well versed in the concept of prevention, the levels of prevention and early detection and down staging of malignancy in the Indian situation..

- (a) Discuss the techniques and effects of the oral screening programmes on incidence, morbidity and mortality rates.
- (b) Nasal endoscopy for ca nasopharynx
- (c) Prevention and screening including techniques of other malignancies including breast.
- (d) Cancer Control and organization of screening programmes
- (e) Screening for hereditary malignancies
- (f) Universal precautions in prevention of infection

4.5 DIAGNOSIS & STAGING OF HEAD & NECK CANCERS

The candidate should be able to obtain a comprehensive medical history from patient / families / communities and perform a complete physical examination in addition to a ENT examination.

Should be able to select the diagnostic techniques needed to:

- (a) Establish the diagnosis.
- (b) Evaluate pre malignant disease and co-existing disease, which may have been important bearing on selection of and response to treatment
- (b) Evaluate the response to treatment
- (c) Evaluate recurrent disease
- (d) Establish the extent of disease.

Understand the principles and applications of surgical and clinical staging where applicable. Stage the cancer according to the current TNM and AJCC classification for different head and neck cancer site, and organ.

Should learn about the following techniques

- (a) Upper GI Endoscopy
- (b) Bronchoscopy

- (c) Nasal endoscopy
- (d) Direct Laryngoscopy

Should have adequate knowledge of frozen section and fine needle aspiration cytology.

The candidate should be able to describe the indications for the following radiological investigations, diagnostic techniques and their relative value and limitations.

- (a) Standard plain film of heart and lungs, abdomen and skeletal system.
- (b) Ultrasonography of neck and abdomen
- (c) Ultrasound guided fine needle aspiration cytology
- (d) Computerised tomography and MRI
- (e) Angiography
- (f) Nuclear magnetic resonance imaging
- (g) Positron Emission

The candidate should be able to describe the indications for and current use of radio-isotopic scanning of:

- (a) Bone
- (b) Thyroid

The candidate should be able to explain the basic principles, indications and interpretations of assays for tumor markers:

The candidate should be able to interpret abnormal values in blood chemistry as they pertain to head and neck malignancy and its therapy.

4.6 ***PATHOLOGY***

The candidate should be able to identify, on the basis of direct visual and microscopic evaluation, lesions that are premalignant or malignant and distinguish them from benign disorders. The candidate should understand the genesis of malignant tumors, the biologic behavior of premalignant and malignant tumors, important characteristics and prognostic features. Students also need to know the importance of doing immunohistochemistry, and its importance in head and neck cancer diagnosis. The candidate should have extensive knowledge of the minutiae of clinico-pathological correlation.

The candidate should be able to identify the following conditions correctly by gross and or microscopic evaluation

- (a) Premalignant lesion of oral cavity and larynx
 - i. Leukoplakia
 - ii. Erythroplakia
 - iii. Erythroleukoplakia
 - iv. Submucous fibrosis

- (e) Verrucous carcinoma
- (f) Different differentiation of squamous carcinoma
- (g) Different Histological type of thyroid cancer
- (h) Different Histological type of parotid cancer
- (i) Different Histological type of nasopharyngeal cancer
- (j) Benign condition of oral cavity, nose and PNS.
- (k) Sarcomas of head and neck regions
- (l) Metastatic tumor
- (m) Malignancies of unknown primaries
- (n) Adenoid cystic carcinomas
- (o) Lymphomas

4.7 **PHYSIOLOGY AND PATHOPHYSIOLOGY**

The candidate should have sufficient knowledge of normal physiology and pathophysiology to manage appropriately the head and neck cancer patient.

The candidate should be able to describe the following:

- (a) Process of speech and swallowing
- (b) Fluid and Electrolyte Abnormalities
- (c) Respiratory and metabolic acidosis and alkalosis.
- (d) Nutrition support to cancer patients
- (e) Transfusion of blood and its components
- (f) The process of normal haemostasis
- (g) Changes in the process of haemostasis in abnormal coagulation states.
- (h) The normal physiology of pulmonary function and pulmonary function tests
- (i) Ventilatory failure due to acute or chronic pulmonary disease
- (j) Aetiology, diagnosis and treatment of physiologic alterations in major organs induced by hypovolemic shock, cardiogenic shock & septic shock
- (k) Normal renal function including control mechanisms
- (l) The physiology of abnormal renal function
- (m) Normal function of digestive tract including hepatobiliary system & their disorders related to malignancies
- (n) Normal function of Endocrine System & its abnormalities related to malignancies
- (o) Immune system and its relevance in oncology

4.8 **MICROBIOLOGY**

The candidate should be able to discuss the problem of infection:

- (a) Prevention of infection and Universal Precautions
- (b) Nosocomial infections e.g. VRE and MRSA
- (c) Postoperative infections
- (d) Precautions involved in the collection, preservation and transport of specimens for microbiological testing

4.9 **PHARMACOLOGY**

The candidate should know the pharmacologic properties of the agents commonly used in head and neck oncology specially the classification, mode of action, routes of administration, dosages and toxicities of various cytotoxic drugs and immunotherapeutic agents.

4.10 **Recent Advances in Head and Neck Malignancy**

4.11 **Theory lectures on organ specific cancers**

4.12 **Different types of incisions**

4.13 **Class on Surgical instruments**

5. **Desired skills to be achieved by the candidates:**

Patient care: The candidate will have to learn and gain competence in the entire outpatient and inpatient ward procedures of physical examination, assessment and investigations including upper GI endoscopy, bronchoscopy, direct laryngoscopy and perform emergency surgical procedures like tracheostomy and minor surgical procedure like excision biopsy independently. The candidate will learn principles of management of women with head and neck cancer which will involve diagnosis, clinical staging, planning, management, prevention of complications, follow up, palliative care and pain relief, terminal care etc.

Theory: At the end of the first six months the candidate will be assessed on staging of all the head and neck cancers, surgical anatomy including genetics, physiology as applied to head and neck oncology, prevention, early detection, management of premalignant and benign lesions of the head and neck region. At the end of the second six months the assessment will be on pathology and cytology, pharmacology and medical oncology, microbiology, biochemistry, including interpretation of laboratory reports as applied to head and neck oncology

Surgical Skill : At the very outset the candidate's surgical skill will be assessed and accordingly surgical responsibility will be allotted. This is because generally the ENT student will be oriented about the head and neck region, but it may be little difficult for the general surgery or MDS student. Hence it may be necessary initially to train the candidate to become competent in performing surgery for non malignant conditions independently and assist the consultants in surgery for malignant disease. The candidate should have done satisfactorily at

least 20 surgeries for small tumor independently before being permitted to do surgery for advance stage disease with consultants assisting and under their direct supervision.

Research Project: The candidate will choose the research topic within 6 weeks and present the same including aims, objectives, literature review and methodology, proposed method of analysis and data management at the Institutional Ethics Committee and commence work after obtaining clearance. A progress report will be submitted to the head of the department every three months.

6. ***Desired clinical & surgical procedures which should be demonstrated to the candidates or the candidates be imparted competencies:***

Procedures to be performed without anesthesia in the outpatient

General examination and ENT examination, including indirect laryngeal mirror examination
Punch biopsy
Upper GI endoscopy
Bronchoscopy
Nasal endoscopy
Insertion of voice prosthesis

Minor Procedures to be performed under local anaesthesia /general anaesthesia

Excision biopsy
FNAC - lymph nodes, thyroid swelling
Tracheostomy
Microlaryngeal surgeries under microscope
Laser surgeries for premalignant lesion of oral cavities

Major procedures undertaken under regional or general anaesthesia

- Neck dissection (SOHD, MND, RND)
- Wide excision
- Wide excision and marginal mandibulectomy with /without neck dissection
- Wide excision and segmental mandibulectomy with /without neck dissection
- Commando operation
- Hemi/Total thyroidectomy with /without neck dissection, and central compartment clearance
- Superficial / Total Parotidectomy
- Different reconstructive procedure like – local flap, pedicle flap like PMMC, free flap like FRAFF.
- Upper alveolectomy, Partial / Total maxillectomy
- Anterior / Lateral skullbase surgeries

The trainee must *independently perform* under direct supervision and assisted by consultants the following procedures in first years:

Sl.	Type of procedure	Total
1	Upper GI Endoscopy	200
2	Bronchoscopy	40
3	Nasal Endoscopy	40
4	Excision Biopsy	70
5	Tracheostomy	80
6	Laser wide excision of premalignant lesion.	25
7	Neck dissection	20
8	Wide excision and segmental mandibulectomy	10

7. *Theory topics which should be covered for the candidates*

7.1 **CHEMOTHERAPY OF HEAD AND NECK TUMOURS**

- (a) The kinetics of cancer cell growth and the cell growth and the cell cycle
- (b) General principles of action:
- i. Log kill hypothesis
 - ii. Cycle specificity
 - iii. Phase specificity
 - iv. Growth fraction
- (c) Classes of Chemotherapeutic Agents
- i. Alkylating agents
 - ii. Antimetabolites
 - iii. Natural products, including mitotic inhibitors, antibiotics and enzymes
 - iv. Hormones
 - v. Biologic response modifiers e.g. Interferon etc
 - vi. Other currently used classes like different targeted therapies
- (d) Mechanisms of Action of cytotoxic drugs
- (e) Pharmacology of Specific Agents
- i. Distribution
 - ii. Biotransformation
 - iii. Excretion
 - iv. Interaction with other drugs
 - v. Interaction with radiotherapy and hyperthermia
 - vi. Mechanism of drug resistance and approaches to reducing tumour resistance to anti-cancer drugs
 - vii. Schedule dependency
 - viii. Rationale for targeted therapies
- (f) Combination Chemotherapy
- i. The principles of concomitant chemo-radiotherapy
 - ii. Drug combinations in current use for head and neck malignancy

(g) General Guidelines for Clinical Evaluation

- i. Criteria for complete response, partial response, progressive disease, relapse, stable disease and survival duration
- ii. The concept of Phase I, II and III drug trials.
- iii. The criteria or prerequisites for adjuvant chemotherapy.

(h) Toxicity

- i. The effects of chemotherapeutic agents on rapidly proliferating epithelium such as bone marrow, GI tract and hair follicles.
- ii. The major toxic effects of specific chemotherapeutic agents.
- iii. Management of toxicity
 - * Supportive (nutritional, hematinic, prophylactic antibiotics)
 - ** Specific (blood component therapy, specific antagonists)
 - *** Protective environment

(p) Chemotherapy treatment by Organ Site, Histology and Stage.

(q) Palliative chemotherapy and metronomic therapy

7.2 THERAPEUTIC PRINCIPLES

(a) Pretreatment Evaluation:

The candidate should be able to fully evaluate clinically and order the appropriate tests to assess: -

- i. Major organ system (e.g. cardiac, renal, pulmonary, hepatic)
- ii. Coagulation profile
- iii. Presence of metastatic disease
- iv. The ability of the patient to psychologically cope with the treatment programme and her disease

(b) Preoperative Preparation

The candidate should be able to:

- i. Take special consent for total laryngectomy, total thyroidectomy, exenterations of eye etc.
- ii. Prepare the bowel preoperatively
- iii. Correct fluid, electrolyte, haematological and nutritional deficiencies.
- iv. Order pulmonary preparation when indicated
- v. Fully inform and counsel the patient and family
- vi. Order anticoagulant and prophylactic antibiotics where indicated
- vii. Order antithrombotic measures such as stockings and sequential compression devices and their limitation

(c) Choice of treatment

The candidate should be able to discuss the evaluation and management of patients with the following diseases in addition the candidate should be able to describe the aetiology, pathology, natural history, risk factors, staging and alternatives of treatment of all stages of the disease, and symptoms and signs produced by the malignancy. This should include management of patients of all age group, those who are pregnant and those with recurrent disease.

(d) Management of Per-operative Complications

- i. Transfusion reaction
- ii. Coagulopathies
- iii. Massive pterygoid bleeding
- iv. Trauma to major artery or vein
- iv. Cardiac arrest

(e) Management of Postoperative Complications

- i. Shock
- ii. Atelectasis and other respiratory problems
- iii. Haematoma
- iv. Anuria or oliguria
- v. DVT and Pulmonary embolism
- vi. Cardiac problems
- vii. Infections
- viii. Seroma
- viii. Chyle leak
- ix. Flap failure
- xii. Jaundice
- xiii. Coagulopathies

7.3

SURGICAL MANAGEMENT OF HEAD AND NECK CANCERS

- (a) Surgery for primary tumor:
- i. Wide excision Buccal mucosa tumor/ Lip tumor
 - ii. Wide excision with marginal/segmental/hemimandibulectomy for GBS tumor
 - ii. Wide excision/partial glossectomy/ hemiglossectomy /total glossectomy with pull through procedure.
 - iii. Intraoral wide excision of tonsillar tumor/ tonsillar commando surgery
 - iv. Transoral laser surgery for early glottis or marginal zone tumor

- vi. Partial/Near total /Total laryngectomy with or with out partial pharyngectomy
 - vii. Total laryngo-pharyngo-oesophagectomy
 - v. Hemi / total thyroidectomy with or without central compartment clearance
 - vii. Upper alveolectomy / partial Maxillectomy / Total Maxillectomy
 - vi. Partial / total Parotidectomy
 - vii. Orbital enucleation / exenteration / Anterior skullbase surgery
 - viii. Surgery for parapharyngeal tumor
 - ix. Surgery for scalp tumor
 - x. Ear surgery / Lateral skull base surgery
 - xi. Benign tumor of mandible
 - xii. Benign neck tumor
- (b) Surgery for metastatic neck node:
- i. Supra omohyoid neck dissection/ Modified neck dissection / Radical neck dissection
- (c) Reconstructive Procedures
- i. Local flap : Nasolabial flap, transposition flap, different local flap for lip surgery, forehead flap, skin graft etc.
 - ii. Pedicle flap : PMMC, PMMF, L D Flap etc
 - iii. Free flap : FRAFF, Free fibula flap, ALT Flap etc.

7.4

RADIATION THERAPY FOR HEAD AND NECK MALIGNANCIES

(a) Radiobiology

- i. Radiation effect on
 - Cell metabolism
 - Chromosomes
 - Cell cycle
 - Cell population
- ii. Intrinsic radiosensitivity
- iii. Modification of cellular radiosensitivity
 - Molecular Oxygen
 - Radio sensitisers
 - Combined radiation chemotherapy effects
- iv. The four R's of radiobiology - Repair, Repopulation, Re-distribution, Re-oxygenation
- v. Basis of fractionation
- vi. Protection from radiation effect
- vii. Relative radio sensitivity among different organs (tissue tolerance)

- viii. Time dose relationship
- ix. Organ preservation
- x. Therapeutic ratio
- xi. Long-term effects - xerostomia

(b) Radiation Physics

- i. Introductory Radiation Physics
- ii. External Beam Therapy (teletherapy)

- Teletherapy sources of x-rays, gamma ray or electron beams: linear accelerators, cobalt, orthovoltage and superficial therapy units
- Characteristics of teletherapy beams: energy, SSD, output, percentage depth dose, field size, flatness penumbra. Relationships between these parameters, Isodose charts.
- Surface build-up (skin sparing) with megavoltage beams.
- Increased attenuation by and excess dose in bone, and their dependence on beam energy.
- Modification of beams: wedges, blocks, compensators
- Basic principles of radiotherapy: tumour volume, target volume, magnitude and homogeneity of tumour dose:
- Combination of beams: parallel opposed pairs, four field box technique.
- SSD and isocentric techniques, rotation therapy, simulators
- The planning process: tumour and normal structure localization: target volume, dose and beam configuration selection; taking of outlines, computation of dose distributions; verification;
- Intensity modulated radiotherapy
- Image guided radiotherapy
- Particulated therapy (proton therapy)

- iii. Intra-cavitary and interstitial irradiation (brachytherapy)

- General forms of the dose distribution required for brachytherapy of Ca lip, BM, Tongue etc. The Manchester system points A and B.
- Combination of brachytherapy and teletherapy treatments.

- iv. Radiation Protection
- Dose equipment, Sv, rem
- Radiation protection philosophy of the ICRP
- Estimation of risk of radiation-induced harm

- Dose equivalent limits for radiation workers, including pregnant and potentially pregnant women. Dose equivalent limits for members of the public.
- Application of ICRP principles to radiation protection of radiotherapy patients.
- Design features of radiotherapy equipment and procedures to prevent malfunctions or errors in dose delivery.
- Shielding incorporated in teletherapy sources.
- Leakage radiation limits
- Design of radiotherapy treatment rooms, primary and secondary barriers, mazes, windows, doors, inter locks.
- Sealed sources for brachytherapy; use of time, distance and shielding to minimize staff exposure during handling. The value of manual and remote after loading.
- Care and storage of sealed sources. Record keeping and precautions against loss.
- Leak testing.
- Departmental surveys, area monitoring and personnel monitoring

(c) Clinical Radiotherapy

Place of radiotherapy and treatment planning i.e. (indications, limitations and side effects) in head and neck malignancy in the following:

- ii. orbit
- iii. near spinal cord and near brain in skullbase tumor

7.5 PAIN RELIEF, PALLIATIVE AND TERMINAL CARE

- (a) Concept of palliative care
- (b) Breaking the news and counseling
- (c) Pain relief: -
 - i. WHO guidelines for pain relief
 - ii. Non-narcotic analgesics
 - iii. Narcotic analgesics
 - iv. Invasive procedures for pain relief
 - v. Non-pharmacological & non-invasive procedures for pain relief
- (d) Symptom relief other than pain
- (e) Community support roles; - general practitioner; family- religion;
- (f) Concept of hospice care.

8. *Theory topics which should be covered for the candidates*

8.1 **PSYCHO-SOCIAL ASPECTS OF ONCOLOGY CARE**

- (a) The quality of life issues in head and neck cancers
- (b) Rehabilitation
- (c) The psycho-social aspects of head and neck cancers

8.2 **BIOSTATISTICS AND RESEARCH METHODS**

The candidates should be taught about

- (a) Evaluation of research methodology and findings of research reports and scientific articles.
- (b) Planning research studies or clinical investigations, analysis of the data and report the results.
- (c) The basis of quantitative approaches to diagnosis, prognosis and medical decision-making
- (d) Descriptive statistics
- (e) Formulation of testable hypotheses for a clinical investigation
- (f) Select and apply appropriate statistical tests (Chi square, 't' test, Mann-Whitney etc) to clinical data in order to test hypotheses
- (g) Calculate the sensitivity and specificity and predictive values of screening tests or clinical investigations.
- (h) Analyse the relative prognostic importance of separate clinical and pathological variables using the Cox model.
- (i) Use the life table method for reporting results and Compare different life tables
- (j) Writing scientific articles for peer review.

8.3 **ETHICS AND GOOD CLINICAL PRACTICE IN RESEARCH**

- (a) Understand the principles of ethical practices in research
- (b) ICH-GCP guidelines and ICMR guidelines
- (c) Obtaining Informed consent

- (d) Protection of rights of patients and research participants
- (e) Maintaining privacy of records and information
- (f) Reporting of adverse events and serious adverse events

8.7 Theory examination (present pattern is 10 short structured questions in each of the four / three papers each paper is of 100 marks) in the specialty and list the topics

Theory Examination should be held at the end of the course consisting of four theory papers each for the duration of three hours and for 100 marks – total of 400 marks. There will be following types of questions in each paper:

- (a) Case based questions
- (b) Short structured questions
- (c) Very short questions

The details of the subjects to be covered in respective papers are as follows. Some degree of overlapping of the subjects is inevitable:

Paper 1

Basic sciences and principles of oncology as applicable to head & neck oncology:

Aetiology of Cancer
 Pathogenesis of Cancer
 Premalignant conditions
 Experimental Oncology
 Tumor Immunology including vaccines
 Tumor Biology
 Principles of Cytogenetics and Molecular Biology
 Host effects of cancer
 Cancer Epidemiology
 Haematological complications of cancer
 Disseminated intravascular coagulation
 Development of new drugs
 Infections including HIV in patients with cancer
 Cancer Detection and Prevention
 Diagnostic and intervention radiology as applicable
 Principles of Patient Management
 Principles of Nuclear Medicine
 Experimental design of clinical trials
 Principles of Cancer Surgery
 Principles of Radiation therapy
 Principles of Cancer Chemotherapy
 Chemotherapeutic agents
 Principles of endocrine therapy
 Principles of staging of cancer

International Classification of Disease - Oncology
Cancer Registry
Cancer Control

Paper 2

Clinical Head and Neck Surgery

Paper 3

Aetiology, Epidemiology, Pathology, Screening, Prevention, Detection, Clinical features, Investigation, Diagnosis, Management, Rehabilitation, Follow-up, Palliation, Pain relief, Terminal care.

Paper 4

Recent advances in head and neck oncology and implications in head and neck oncology including innovative therapies.

The theory examination should be followed by *clinical and practical examinations* in the following format:

Day 1

1. At least three typical cases to be examined and discussed in terms of :

History

Physical and ENT examination findings

Ability to reach a logical diagnosis

Ability to formulate a plan for work up and management of each case

Ability to modify management according to the results of various

Investigations made available by the examiner

2. Spot diagnosis

Imaging, histopathology slides, instruments, spot cases

Day 2

Clinical ward rounds and viva there of

Grand Viva - Questions involving head and neck oncology syllabus

Viva Voce related to (a) The Research Project (b) The Daily Record log book

Recommended Books

- Head & Neck Surgery – Stell and Maran
- Operative Surgery – Rob & Smith
- Head and Neck Surgery and Oncology – Jatin Shah
- Scott-Brown's Otolaryngology – 7th Edition
- Surgical Handicraft - Pai
- Cancer of the Head and Neck – Myers
- Oral & Maxillofacial Surgery – Raymond J. Fonseca
- Surgery of the skull base – J. Donald
- Text Book of Head & Neck Surgery – Ballenger
- Encyclopedia of Flaps in Head & Neck - Grabb
- Human Anatomy – B.D. Chaurasia
- Devita – Cancer : Principles & Practice of Oncology
- Head and Neck Cancer : Multimodality Management - Jacques Bernier
- Surgery of the Thyroid and Parathyroid Glands – Gregory W. Randolph
- Bailey & Love – Short Practice of Surgery
- The Washington Manual of Oncology - Govindan
- Halprin – Perez and Brady's Principles & Practice of Radiation Oncology.
- Harrison – Textbook of Internal Medicine.
- Voice Conservation Surgery for Laryngeal and Hypopharyngeal Cancer – Sultan Pradhan
- Moeller – Pocket Atlas of Sectional Anatomy. (Vol. 1, 2 & 3)
- Perry – The Chemotherapy Source Book.

9.1 ***Standard Reference books***

- Evidence Based Management Guide line – Tata Memorial Hospital
- Atlas of Endoscopic Laryngeal surgery – Robert T Satalof, Farhad Chowdhury
- AJCC Cancer Staging Handbook
- Nasopharyngeal Carcinoma: Etiology and Control, International Agency for Research on Cancer
- Mastery of Endoscopic & Laparoscopic Surgery - Nathaniel J Soper & others
- How to Write a Paper – George M Hall

- Becoming a Successful Clinical Trial Investigator – P.K. Julka
- All You need to Know about Clinical Research – Sanjay Gupta
- Ear Surgery – Richard R. Gacek
- Thyroid Cancer: An Indian Perspective - D.H. Shah, A.M. Samuel, R.S. Rao

Journals (that can be printed or online)

- Brit. J. Surgery
- Brit. J.Cancer
- Cancer
- Cancer Epidemiology: Biomarkers & Prevention
- Head Neck
- Indian Journal of Otolaryngology and Head & Neck Surgery
- International Journal Head and Neck Surgery
- Indian Journal of Plastic Surgery
- Oral Oncology
- Otolaryngologic Clinics of North America
- J. Surgical Oncology including seminars in surgical oncology
- Medical Oncology
- Palliative Medicine
- The Lancet
- Laryngoscope
- Indian Journal of Cancer
- International Journal of Cancer
- Journal of Pathology
- New England Journal of Medicine
- Seminars in Oncology