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FACULTY OF POSTGRADUATE MEDICINE

DOCTOR OF MEDICINE (MD)
CURRICULUM
OTORHINOLARYNGOLOGY (ENT2018)



Khesar Gyalpo University of Medical Sciences of Bhutan

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BACKGROUND

Bhutan is a small country in the Himalayas sandwiched between two giant nations, China in the north and India in the south, east and west. The country has a difficult and rugged terrain consisting mostly of steep and high mountains crisscrossed by a network of swift rivers, which form deep valleys before draining into the Indian plains¹. The current population of Bhutan is 775,445 with general literacy rate of 63 percent (2012).² The provision of basic health services are state's affair as enshrined in the constitution, "The state shall provide free access to basic public health services in both modern and traditional medicines".³ The National Health Policy states that Royal Government of Bhutan shall continue to follow the Primary Health Care Approach with Primary Health Care Workers at the primary level, General Practitioners at the district level and specialized services at the regional and central level and it aspires to be congruent with the philosophy of Gross National Happiness and reflects various inputs ranging from social, cultural, spiritual and environmental aspects.⁴

RATIONALE

The number of doctors in our country is insufficient as compared to the population. More so in the number of specialists in the country, thereby causing tremendous problem in delivering tertiary care to our people. Department of Otolaryngology has been rendering services of expatriate doctors from Cuba, Myanmar and India for last couple years. Rendering services of expatriate doctors is difficult as there is a language barrier and also causes huge expenditure to the government. Moreover, finding specialist doctors to work in Bhutan is difficult as many are not willing to come as they think the salary package is not attractive. So, this residency programme aims to produce enough otorhinolaryngologist in our country so that we can ensure our patients receive tertiary otolaryngological care without any language barrier and also without draining the finances of our country. As we grow, we also intend to train foreign students in our country so our country can earn some money and help in realizing the government's aim of making our country an education hub in the south east Asia.

GOAL

Objectives

The aim of this residency programme is to produce enough otorhinolaryngologist in our country so that we can ensure our patients receive tertiary otolaryngological care without any language barrier and also without draining the finances of our country. As we grow,

¹ Geography of Bhutan [Internet]. Royal Society for Protection of Nature. [cited 27 May 2016]. Available from: <http://www.rspnbhutan.org/aboutbhutan/geography>Geography of Bhutan

² Key indicators [Internet]. National Statistics Bureau. 2016 [cited 27 May 2016]. Available from: <http://www.nsb.gov.bt/nsbweb/main/main.php#&slider1=4>

³ The constitution of Bhutan, article 9; 2008

⁴ Acts, policies and regulations [Internet]. Ministry of Health. [cited 26 May 2016]. Available from: <http://www.health.gov.bt/wp-content/uploads/mohfiles/2015/11/National-Health-Policy.pdf>

we also intend to train foreign students in our country so our country can earn some money and help in realizing the government's aim of making our country an education hub in the south east Asia.

LEARNERS AND LEARNING ENVIRONMENT

The symbiotic relationship that exists in the context of Bhutan for training of is depicted in the following diagram (adopted from the work by⁵ Worley et al. 2006).

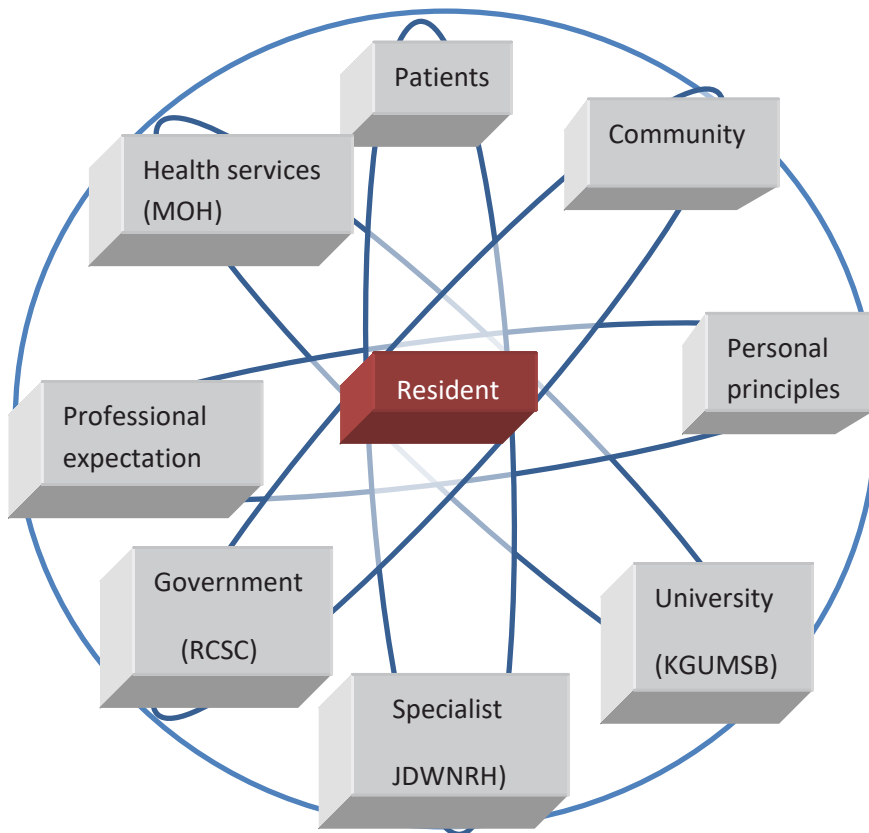


Figure 1: The Symbiotic relationship in Postgraduate Medical Education

After completion of an internship, the undergraduate doctors are employed by the Government (Royal Civil Service Commission - RCSC) under the Ministry of health (MOH). When they qualify for the vocational training, this will be an “in-service training” funded by the government. The Medical University (KGUMSB) will run the training programme in association with the teaching hospital (Jigme Dorji Wangchuk National Referral Hospital – JDWNRH). The Ministry of Health, collaborating with RCSC, is responsible for deployment

⁵ Worley P, Prideaux D, Strasser R, Magarey A & March R. Empirical evidence for symbiotic medical education: a comparative analysis of community and tertiary-based programmes. Blackwell Publishing Ltd 2006. MEDICAL EDUCATION 2006; 40: 109–116

of doctors and other allied health professionals in the health centers throughout the country. The central referral hospital (JDWNRH) is a multispecialty hospital where the training of Otorhinolaryngology, Head and Neck Surgery will take place.

The postgraduate training in otolaryngology and head neck surgery will be a time limited phase of training under supervision leading to recognized and competent ORL-HNS surgeon.⁶ The eligibility to sit the entrance examination requires candidates to have a recognized MBBS degree, to have completed the internship and to have at least one year of experience in working in a health Centre.

Once selected, they will undergo a supervised vocational training mainly in the Central Referral Hospital and other Referral and District hospitals. After 4 years of training, the successful resident will be awarded masters in Otorhinolaryngology, Head and Neck Surgery after completion of the University Examination.⁷

The major residency training will take place at Jigme Dorji Wangchuk National Referral Hospital. This hospital has all the relevant departments including a department of Otorhinolaryngology, Head and Neck Surgery. The residents will rotate through different departments during their four years training but Otorhinolaryngology, Head and Neck Surgery department will be their home base for learning environment. available is influenced by contextual cues more strongly than originally assumed.

The hospital-based training of Otorhinolaryngology, Head and Neck Surgery in Bhutan's context, gives ample opportunity to learn cases and problems common in rural areas in the districts, provided it is embedded in an integrative curriculum. To explain this, the following analogy may be helpful. Education in Otolaryngology and head neck surgery can be seen like a flowing river with its tributaries (different rotational postings) as explained by the analogy drawn with the river (illustrated in figure 2). The analogy is drawn with a river that begins as a rivulet (pre-specialized training), becomes bigger and bigger with each tributary from which it receives a contribution (knowledge, skills and professionalism). The zigzag course represents the adoptable nature and diversity of student's education, according to the needs of the community.

The river base embodies the adherence to the five domains of Otorhinolaryngology, Head and Neck Surgery. Finally, it flows on and joins the ocean, meaning the student's competencies contribute to the vast ocean of expertise needed to give better health care to the community, nation and the world, as a whole. Figure 3 illustrates the types of curriculum at different points of time during training and how rotational postings add to the competency of the students. The curriculum is planned, keeping in mind the support

⁶ WONCA publications [Internet]. WONCA Global Family Doctor. 2013 [cited 29 May 2016]. Available from: <http://www.globalfamilydoctor.com/Resources/WONCAResources.aspx>

⁷ Academic Programme [Internet]. KGUMSB. 2016 [cited 29 May 2016]. Available from: <http://www.umsb.edu.bt/index.php/2015-03-16-05-27-52/pgmec>

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necessary to implement it and its learning outcomes. The intended curriculum is one which is planned, the supported curriculum is how various resources support learning and teaching, the taught or enacted curriculum is what is actually taught, the assessed curriculum denotes how enacted curriculum is assessed and the attained curriculum is the learning experiences as perceived by learners. The intention of this curriculum is the cohesiveness among this categorization.^{8,9}

The programme is designed to produce candidates who are not only competent in performing the functions of an ORL-HNS surgeon, but are capable of pursuing further training in a sub-specialty of their interest. Thus, we hope to achieve by providing them with a balance of responsibility and independence with adequate supervision during training. As the training progresses, the trainees will be given the task of incremental responsibility for patient care with a corresponding reduction in the level of supervision. The trainees will be assigned to senior staff (supervisors), which will provide the trainees with increasing responsibilities during the training period. The supervisors are expected to submit the report of the trainees' progress at the end of each posting.

The outline of the knowledge skills and attitude required for this Programme is enumerated below:

Year 1: The trainees will be posted to do twelve months of ORL-HNS clinical posting. During this period, they must acquire adequate knowledge of basic medical sciences as a foundation to clinical ORL-HNS and be ingrained in the principles of practice of ORL-HNS. The trainees must apply this knowledge in the day-to-day management of ORL-HNS patients. The trainee must also acquire the basic ORL-HNS knowledge. The focus will be on anatomy, physiology of ORL-HNS in details, clinical examination and approach to cases.

Year 2: To broaden their perspectives in the practice of ORL-HNS, trainees will be rotated to several subspecialties, including, Plastic surgery, pediatric ORL and head & neck surgery, speech therapy and audiology

Year 3: There will be postings as an ORL-HNS trainee in Otolaryngology, Rhinology, Laryngology, Head & Neck and Pediatric ORL. Additionally there will be posting in oral and maxillofacial surgery, anesthesia and general surgery. There will also be posting for hospital administration.

⁸ Definitions of curriculum [Internet]. Slide share.net. 2016 [cited 29 May 2016]. Available from: <http://www.slideshare.net/levema/definitions-of-curriculum>.

⁹Khaleghinezhad S, Ali. Exploring the Typology of Curriculum in Undergraduate Education): A Descriptive Qualitative Study. 2016 (unpublished).

Year 4: Trainees will continue with ORL-HNS training and function as Senior Registrars managing general ORL-HNS cases almost independently. The postings will include Otology, Rhinology, Laryngology and Head & Neck Surgery. There will also be out country posting and district posting.

Throughout the programme, the trainees are expected to carry out course-work in addition to their clinical commitments. The course-work will include cases write-up, journal reviews, participation in workshops, and conducting research. They are expected to maintain a logbook documenting all the cases managed, procedures carried out and knowledge they have acquired.

The Working Hours is 8am to 3 pm Monday to Friday and 8am-1Pm on Saturdays. Sundays and Government holidays are free (except oncall days).

There will be 24 hour First On-call for year 1-3 on rotation basis.

There will be 24 Hour 2nd Oncall for 4th years (registers) on rotation basis.

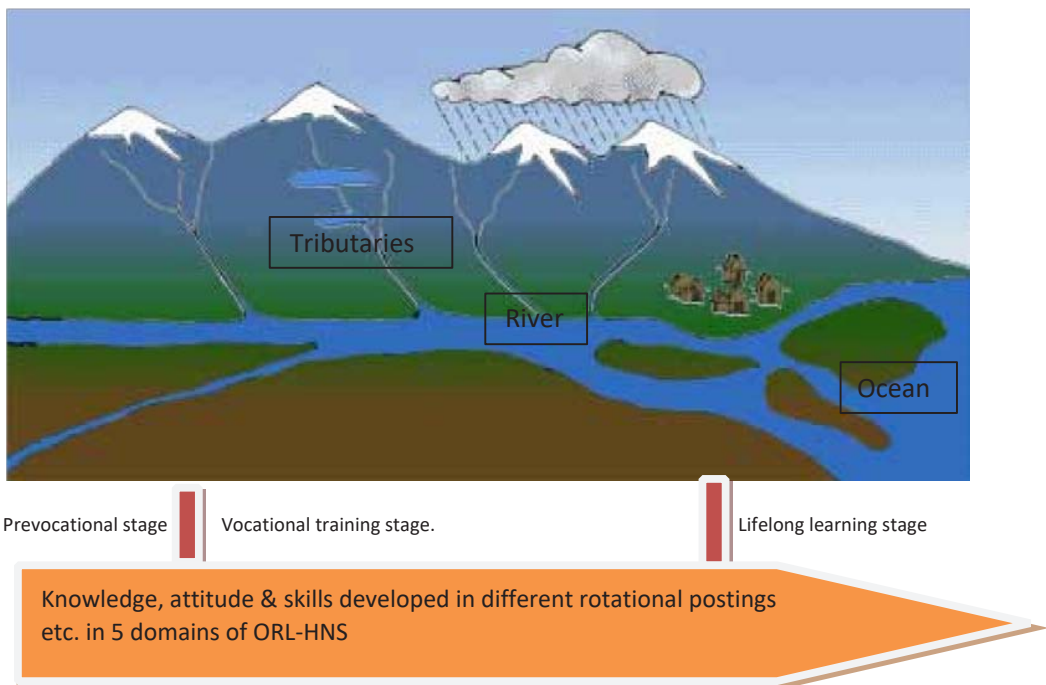


Figure 2: The River Analogy of vocational training of Otorhinolaryngology, Head and Neck Surgery

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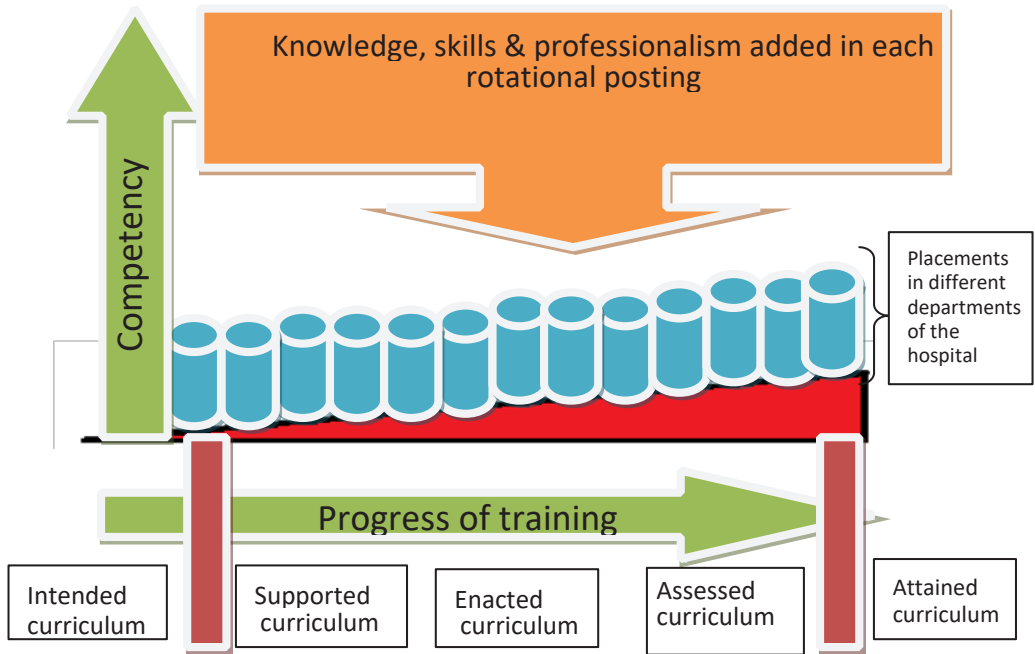


Figure 3: To show the categorization of curriculum and added competencies in each posting

AN OVERVIEW OF ROTATIONAL SCHEDULE

Sl. No.	Activity	PG 1		PG 2		PG 3		PG 4	
		1	2	3	4	5	6	7	8
1	Generic Curriculum								
2	IPD/OPD placement								
3	Lecture class								
4	General surgery			4 weeks					
5	Radiation and medical oncology					3 weeks			
6	Radio-diagnosis rotation			4 weeks					
7	Maxillofacial					2 weeks			
8	Anesthesia					2 weeks			
9	Audiology		2 weeks		2 weeks				
10	Speech therapy				2 weeks				
11	Hospital administration							2 Weeks	
12	Field posting					August		October	4 weeks
13	Overseas posting 4 weeks/year			February			March 4		
14	Assessment Schedule	2 nd week December		3 rd Week of May			1 st week of June		3 rd &4 th Week, May
15	Continuous assessment								

Term: July to December and January to June (6 months), 4 years is divided into 8 terms.

***: refer the section on assessment system for further details

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Rotational Schedule

outcountry 4weeks in 4th year
 Oral and maxillofacial surgery 2 weeks in 3rd year
 Hospital Administration 2week in 3rd year
 District Hospital posting 4weeks in 4th year
 General surgery 4weeks in 1st year
 Radiology 4weeks in 2nd year
 Speech 2weeks in 2nd year
 Audiology 2 weeks each in 1st and 2nd year
 Anaesthesia 2weeks in 3rd year
 Radiation and medical oncology 3weeks in 3rd year

Figure 4: to show comparative duration of posting in each department.

Four Year Rotational Plan in weeks

The following table summarizes the duration of postings in weeks in each department. Three summative examinations are scheduled at the end of term 1(Institute examination I – IE I), 4th term (Institute examination II – IE II) and 8th term (University examination – UE).

Rotation block	Year one		Year two		Year Three		Year Four	
	Term I	Term II	Term III	Term IV	Term V	Term VI	Term VII	Term VIII
Generic	24							
Radiology			4					
Oral and maxillofacial surgery					2			
Reconstructive and general surgery		4						
Hospital administration							2	
District Hospital					4		4	
Out country					4		4	
Radiation and medical oncology					3			
Anesthesia					2			
Speech			2					
Audiology			4					
Exam Schedule	IE - 1			IE-2		Thesis defence		UE

ENT Residents are expected to attend all ward rounds everyday including generic posting except rotational postings. The residents will have to maintain a portfolio of all the learning activities including log books and assessments done in each posting aligning with the learning outcomes of the programme. The specialist supervisor will conduct formative assessments as per the mapping with the learning outcomes. The portfolio shall be assessed by the residents, specialist supervisor and the ENT supervisor regularly. It will be further assessed by the internal and external examiner in summative examinations (refer appendix for portfolio assessment forms). The portfolio assessment ratings shall be computerized and maintained in an excel sheet and updated regularly by the ENT Coordinator.

Table 1: Schedule of rotational posting in weeks and the role of Department of Otorhinolaryngology, Head and Neck Surgery

CORE COMPETENCIES

The competency domains in medical profession are grouped differently by different institutes. The Canadian Medical Education Directives for Specialists CanMeds (2015) describes physician's role as Medical expert, Communicator, Collaborator, Leader, Health Advocate, Scholar and Professional.¹⁴ The Accreditation Council for Graduate Medical Education (ACGME)¹⁵ defines six domains as: Patient Care, Medical Knowledge, Practice based learning and improvement, System based Practice, Professionalism and Interpersonal skills and Communication.

In this section, the general learning outcomes are described under the five domains and in the later section under the educational strategies, the specific learning outcomes are detailed in tabular form to align with the teaching, learning activity and assessment methods.

Domain 1: Communication skills and Patient-Doctor relationship this domain: Communication skills, patient centeredness, communicating health promotion, whole person care, are described.

Domain 2: Applied Professional Knowledge and Skill
In this domain: Physical examination and procedural skills, medical conditions and decision making are described.

Domain 3: Community Health and Context Otorhinolaryngology, Head and Neck Surgery
In this domain: Epidemiology, public health, prevention, family influence on health and resources are explained.

Domain 4: Professional and Ethical Role
In this domain: Duty of care, standards, self-appraisal, teacher role, research, network and self care are described.

Domain 5: Organizational and Legal dimensions and information technology/e-health
In this domain: Information technology/e-health, records, reports, confidentiality and practice management are described.

EDUCATIONAL STRATEGIES

Teaching and learning methods

The Curriculum is based on the following principles of learning:^{10,11}

Competency –based Education

Competency based education is defined by identifying the outcomes, defining performance levels, framework for assessing competencies and continuous evaluation process. The training of needs to be focused ORL-HNS on skill development, integrating with knowledge.

The Practice- based, learner centered and experiential learning Education

The training of ORL-HNS residents will take place in a supervised clinical setting. During the rotational postings, the residents will work in General Out Patient Department (OPD) once in a week and attend general rounds in the ward, twice a week with ORL-HNS supervisor. Regular assessments and feedback by the specialist supervisor and the ORL-HNS supervisor will be performed. The residents learn from the following methods but not limited to these:

- i. Case presentations and discussion -
- ii. Real life experience.
- iii. Case managements and discussion
- iv. Mortality and Morbidity Meetings
- v. Bedside Teachings
- vi. Grand Rounds
- vii. Lectures
- viii. Case write up
- ix. Thesis
- x. Poster presentation
- xi. Residents teachings
- xii. Journal clubs
- xiii. Conference/seminars/workshops
- xiv. Demonstrations.
- xv. Project on administration/quality/resource management/Accountability during administration posting.
- xvi. Performing procedural skills under supervision, feedback and reflections
- xvii. Learning & practicing communication skills through role plays and de-briefing
- xviii. Working professionally and ethically as a role model.

The residents need to develop educational and leadership skills as an integral part of their professional career. This curriculum aims to incorporate teaching, mentoring and leadership at all levels of professional life. The residents will be learning assessment

¹⁰ Kern D. Curriculum development for medical education. Baltimore: Johns Hopkins University Press; 1998.

¹¹ Key educational principles and concepts [Internet]. Royal Australian College of General Practitioners. 2011 [cited 28 May 2016]. Available from: <http://curriculum.racgp.org.au/statements/common-training-outcomes/>

and evaluation skills, adult learning principles, instructional and supervision skills, and providing feedback and develop skills on how to learn and educate. The following methods allow residents to acquire the above skills.

- i. Paper presentations and question answer session
- ii. Journal clubs and discussion
- iii. Case presentation and discussion
- iv. Bedside teaching followed by demonstration and practice¹²
- v. Grand rounds and question answer session
- vi. Seminars, Workshops, Conferences, PBL, Research writing (thesis)
- vii. Teaching interns and allied health staffs

Independent Self-Directed Learning:

- i. Reading journals and articles, including web-based material
- ii. Maintenance of portfolio
- iii. Audit and research projects

Assessment methods

Assessment is a strong driving force behind learning and therefore is a main focus in the curriculum design.^{13,14} Since it addresses complex competencies, it requires both quantitative and qualitative information from different sources as well as professional judgment. No single assessment method is inferior or superior and all methods have their strengths and weaknesses. A complete assessment programme tries to balance these out. A further important issue to consider is the problem of domain specificity. Any assessment or test is factually a sample of questions (or assignments or observation) out of huge domain of possible questions, and how a candidate performs on one question is a poor predictor of their performance on any other question. This – slightly counter intuitive – notion of domain specificity^{15,16} requires examinations to be sufficiently long and sufficiently diverse. Assessment programmes can be described using the categorization of Miller's Pyramid (fig. 5). This illustrates a helpful framework for assessment. The base of the pyramid represents knowledge (Knows), followed by competence (Knows how), performance (shows how) and action in the work place (does)²⁴. No single method is able to assess all the layers and therefore multiple methods need to be employed.²⁵ The following methods will be utilized for both formative and summative assessments.

¹² Peters M, ten Cate O. Bedside teaching in medical education: a literature review. *Perspect Med Educ.* 2013;3(2):76-88.

¹³ Frederiksen N. The real test bias: Influences of testing on teaching and learning. *American Psychologist* 1984;39:193-202.

¹⁴ Cilliers FJ, Schuwirth LWT, Adendorff HJ, Herman N, Van der Vleuten CPM. The mechanisms of impact of summative assessment on medical students' learning. *advances in health sciences education* 2010;15:695-715.

¹⁵ Eva K. On the generality of specificity. *Medical Education* 2003;37:587-8.

¹⁶ Eva KW, Neville AJ, G.R. N. Exploring the etiology of content specificity: Factors

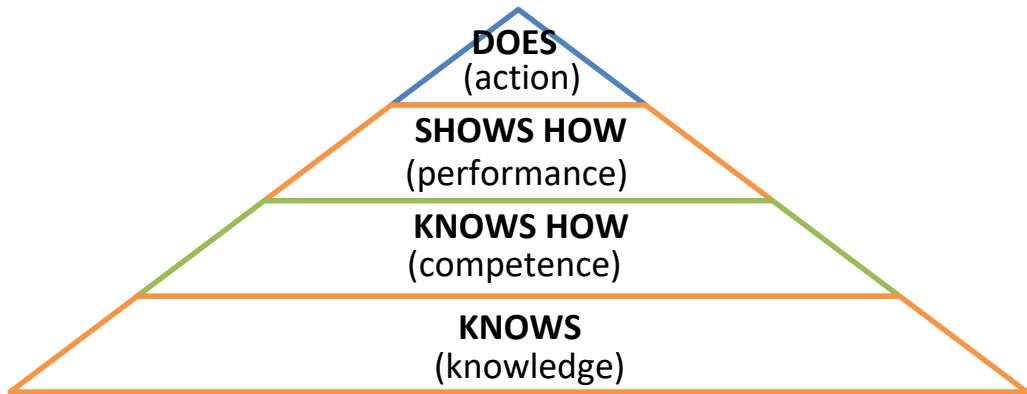


Figure 5: Miller's Pyramid, framework for clinical assessment

360 degree feedback

360-Degree Evaluation/Multisource Assessment consists of measurement tools completed by multiple individuals in a person's sphere of influence. Assessment by peers, other members of the clinical team, and patients can provide insight into trainees' work habits, capacity for team work, and interpersonal sensitivity.²⁶

Mini-CEX

The Mini-CEX is a 10 to 20 minute direct observation assessment or "snapshot" of a trainee-patient interaction. The competencies that can be assessed by this method are: patient's history taking, physical examination, counseling skills, Clinical Judgment/reasoning and overall clinical competence¹⁷.

Objective Structured Clinical examination (OSCE)

Objective Structured Clinical examination (OSCE) This consists of multiple stations in each of which the candidate is asked to perform a different defined task such as taking a focused history or performing a focused clinical examination of a particular system. A standardized marking scheme specific for each case is used¹⁸.

The Short Answer Question (SAQ)

This is an open ended, semi-structured question format²⁵. They take more time to answer than for example multiple choice questions and therefore their reliability per hour of testing time is lower. Generally, it is recommended that they should be used mainly when testing aspects which cannot be tested by closed questions format.¹⁹ A structured predetermined marking scheme improves reliability.

¹⁷ Assessment tools [Internet]. American Board of Internal Medicine. 2016 [cited 28 May 2016]. Available from: <http://www.abim.org/program-directorsadministrators/assessment-tools/mini-cex.aspx>

¹⁸ Tabish, S. A. Assessment methods in medical education. *Int J Health Sci (Qassim)*. 2008 Jul; 2(2): 3–7.

¹⁹ Schuwirth W T Lambert, Vleuten P M Cees. *ABC of learning and teaching in medicine*.

Direct Observation of Procedural Skills (DOPS)^{20,25}

This is a structured rating scale for assessing and providing feedback on practical procedures. The competencies that are commonly assessed include general knowledge about the procedure, informed consent, pre-procedure preparation, analgesia, technical ability, aseptic technique, post-procedure management, and counseling and communication.

Multiple Choice Questions (MCQ)

MCQ tests can be useful for formative and summative assessments and good quality MCQ can be set through peer review process and efficient feedback system^{21,22}. Although time consuming to set, these tests typically have a high reliability per hour of testing time (than open ended questions), because they can easily mitigate the impact of context specificity, i.e. a large number of items can be tested and marked within a relatively short time frame²³.

Structured long questions.

Simulation with standardized patients.²⁷

A standardized patient is a person trained to accurately and consistently portray a patient with a particular medical condition. Based on an encounter between the standardized patient and a student, both the standardized patient and medical professionals can make judgments about the quality of the performance along a number of dimensions (e.g., history-taking, physical examination, interpersonal, and communication skills)

Logbook

In the Logbook students keep a record of the patients seen or procedures performed either in a book or in a computer. It documents the range of patient care and learning experience of students. Logbook is very useful in focusing students on important objectives that must be fulfilled within a specified period of time.^{24,25}

Case-based Discussion (CbD)

This is a valuable workplace formative assessment tool and is used to assess the resident's professional judgments in clinical areas. In this method, a comprehensive review of a clinical case is conducted between a resident and an assessor. After the discussion, the assessor provides feedback to help the resident improve and structure their future learning. The clinical areas that can be assessed by these methods are record keeping, history taking, clinical findings and interpretation, management plan, follow up and future planning.²⁶

²⁰ Norcini J, McKinley D. Assessment methods in medical education. *Teaching and Teacher Education*. 2007;23(3):239-250.

²¹ Bunmi S, Malau-Aduli, Dwight Assenheimer, Derek Choi-Lundberg & Craig Zimitat (2014)

²² 1080/14703297.2013.796711

²³ Wass V, Bowden R, Jackson N. ResearchGate. (2014). *Principles of Assessment Design*. [Accessed 17 Jun. 2016].

²⁴ Tabish, S. A. Assessment methods in medical education. *Int J Health Sci (Qassim)*.

²⁵ Jul; 2(2): 3–7

²⁶ Case-based Discussion [Internet]. RACP. [cited 29 May 2016].

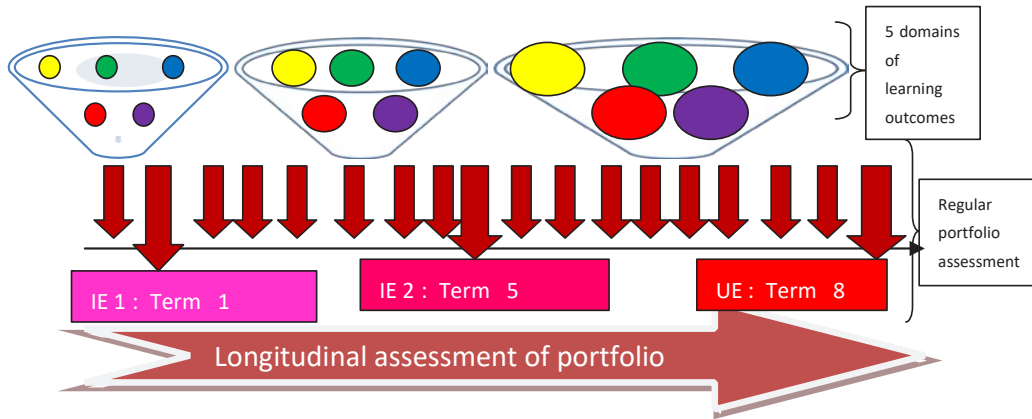


Figure 6: Utility of portfolio as an assessment method

Review of case write up/thesis/projects.

Portfolio assessment^{27,2829}

This method is the most important process that will be utilized to assess ORL-HNS residents. They are required to collect every bit of learning experience and data like a logbook, reflections and all records of learning activity and assessments reflecting five domains throughout-HNS the training period. It will be seen as both the process and the outcome of the ORL-HNS residency programme. As a process, it will enable the residents to monitor their own learning systematically, reflecting on their learning using the five domains leading to learning goals. As a product, it holds the work records and documents the resident has produced representing their achievements. The portfolio will be assessed (fig. 6 and appendix 1 - 6) regularly by the residents, specialist supervisor and the ORL-HNS supervisor. It will be further assessed by internal and external examiner at two low stakes examinations (institute examination I and II – IE 1, IE 2) and finally at high stake examination (University examination - UE), after completion of the residency programme. A good documentation process will be followed to ensure credibility. The following figure (figure 6) illustrates the assessment process of the portfolio. The concept for the flow chart is adapted from the Journal article - Assessing tomorrow's learners: In competency-based education only a radically different holistic method of assessment will work by Lambert Schuwirth and Julie Ash.³⁰

²⁷

²⁸ Zaidi S Nasir M. Teaching and learning methods in medicine.

²⁹ Assessing by portfolio [Internet]. UNSW, Australia. [cited 29 May 2016]. Available from: <https://teaching.unsw.edu.au/assessing-portfolio>

³⁰ Schuwirth L, Ash J. Assessing tomorrow's learners: In competency-based education only a radically different holistic method of assessment will work. Six things we could forget. *Medical Teacher*. 2013;35(7):555-559.

DETAILS OF CORE COMPETENCIES WITH LEARNING METHODS AND TOOLS OF ASSESSMENT

Communication and patient-doctor relationship domain

At the end of the training, the ORL-HNS residents are able to communicate effectively and appropriately with patients, relatives and caregivers and develop skills to maintain good patient-doctor relationship.

Specific Learning Outcome	Teaching/learning activity	Assessment methods
1. Communication is clear, respectful, empathetic and appropriate to the person and sociocultural context	Role play and decontextualization's relating the experiences to first principles.	Standardized Patients- OSCE
2. Effective communication is used in challenging situations like: Breaking bad news Agitated family or patients Discuss poor prognosis of diseases Managing patients experiencing current or consequences of trauma	Interviewing Patients and debriefing Self-reflection on experience	Mini-CEX 360 degree feedback Real patient observation Portfolio assessment Standardized
3. Communication with family, caregivers and others involved in the care of the patient is appropriate and clear Involvement of family member & caregiver in patient management Impacts of patient care burden on caregivers	Role play and decontextualization's relating the experiences to first principles. Interviewing Patients and debriefing	Patients- OSCE Mini-CEX 360 degree feedback Real patient observation
4. Complaints and concerns are managed effectively Approaches to address patient complaints Plans to reduce risk of arising complaints in future	Self-reflection on experience	Portfolio assessment
5. Ways in which health can be optimized and maintained are communicated to patients, family members and caregivers. Self care strategies Nutrition Managing stress prevention of hearing loss early detection of cancer Managing safety risk for older people		

Applied Professional knowledge and skills domain

At the end of the training, the ORL-HNS residents are able to demonstrate relevant diagnostic and managerial skills in patients of all age groups and life stages and perform important procedures *relevant to* ORL-HNS through a holistic and patient-centered approach.

At the end of the training, the ORL-HNS residents develop skills to practice evidence-based medicine innovatively and they collaborate and coordinate care.

Specific Learning Outcome	Teaching/learning Activity	Assessment methods
<p>1. Demonstrate relevant diagnostic and managerial skills in patients of all age groups and life stages with wide range of health problems as specified in the later sections: Procedural skills in ORL-HNS Content outline in different disciplines</p>	<p>Demonstration, practice and feedback Real Life Experience in different postings and reflections Simulations with Standardized patient Simulation with artificial models Case presentations and discussion Case managements and discussion Active involvement in procedural skills, feedback and reflections Paper presentations and question and answer session • Journal clubs and discussion Bedside teaching followed by demonstration and practice Ward rounds and discussion Grand rounds and question answer session Seminars, Workshops, Conferences, PBL, Research writing (thesis) Teaching interns and allied health staffs</p>	<p>OSCE Mini CEX MCQ SAQ, SLQ DOPS 360 degree feed back Case based Discussion (CbD) Portfolio assessment</p>
<p>2. Demonstrate holistic and patient-centered care - Effective history taking, physical examination,</p>	<p>Mini-CEX and feedback Real Life Experience in ORL-HNS Department and district postings</p>	

documentation Need based approach Continuity of care Therapeutic relationship Management plans Psycho -Socio-cultural factors Priority based		Role plays and decontextualization to understand relationship between case and first principles. Interviewing patients and debriefing Small group discussion Readings and discussion		
3. Able to remain informed and innovative Evidence-based resources & practice Up-to- date prescribing knowledge Innovate approach to patient with multiple problems Different models of care- cure, care, rehabilitations etc.		Literature review, critique reflection Journal club and discussion Thesis writing Poster presentation		Portfolio assessment Thesis assessment
4. Able to collaborate and coordinate care Minimize fragmentation of care Effective communication with patient, relatives, caregivers and other specialists Multidisciplinary care Collaborate with other agencies to optimize patient care		Real Life Experience in different postings and reflections Role plays and decontextualize		360 degree feedback Portfolio Assessment

Community Health and context of ORL-HNSdomain

At the end of the training, The ORL-HNSresidents are able to make rational decisions and effectively lead to provide preventive, promotive, curative and rehabilitative health services in the community.

Specific Learning Outcome	Teaching/learning Activity	Assessment methods
1. The pattern and prevalence of disease are incorporated into screening and management purposes Common causes of morbidity & mortality Life style related disease risk factors Environmental risk factors	Work place implementation of screening and prevention strategies and self reflections Team Based Learning Small group Discussion Journal article reading Lectures and QA session	MCQ SAQ, KFQ Portfolio assessment
2. Demonstrate competency in routine community health activities in the district prevention of hearing loss cancer screening program School health programme	Demonstration, practice and feedback Simulations and discussion Real life experience and reflections AV aide learning Role plays and debriefing	MCQ SAQ OSCE MiniCEX DOPS Portfolio Assessment
3. The impacts of social determinants of health are identified and addressed • Societal dysfunction • Familial dysfunction	Interviewing patients and debriefing Real experience and reflections	• Mini-CEX • Portfolio Assessment
4. Current and emerging public health risk is effectively managed Emerging and re-emerging communicable diseases noise induced hearing loss cancer prevention	Case management and discussion Journal club Team Based Learning Workshops, Seminar Real life experience and reflection	MCQ SAQ Portfolio Assessment
5. Barriers to equitable access to quality care are addressed • strategies to improve access to general and preventive care for vulnerable groups	Group discussions Workshops	MCQ SAQ, KFQ • Portfolio Assessment
6. Demonstrate effective leadership in the district health team	Simulation in disasters management drills, motor vehicle accidents etc. Reflection on experience	360 degree feed back Portfolio assessment

Professional and ethical role domain

At the end of the training, the ORL_HNS residents demonstrate self-awareness, professional and ethical role in ORL_HNS practice.

Specific Learning Outcome	Teaching/learning Activity	Assessment methods
1. Adherence to relevant codes and standards of ethical and professional behavior Ethical dilemmas in practice situations and access to professional support Evaluate and review professional behavior against appropriate codes of conduct	Real life experience and Reflections PBL Small group discussions Role model	360 degree feedback Work place assessment Portfolio Assessment
2. Duty of care is maintained Manage obstacle to provision of duty of care Record and report any instances that may have been compromised	PBL Small group discussion Real life experience and Reflections	360 degree feedback Portfolio Assessment
3. Critical incidents and potential critical incidents are identified and managed.	PBL TBL Real life experience and reflections	PortfolioAssessment
4. Professional knowledge and skills are reviewed and developed.	Reading articles Workshops, seminars, conferences	PortfolioAssessment
5. Reflection and self- appraisal are undertaken regularly	Self- reflections	Portfolio Assessment
6. Personal health and wellbeing is evaluated, maintained and developed	Self- reflection Role Model	Portfolio assessment

Organizational and legal dimension domain

At the end of the training, the ORL_HNS residents demonstrate ability to work within statutory and regulatory requirements guidelines and they use quality practice management processes and systems to optimize safety in ORL_HNS.

Specific Learning Outcome	Teaching/learning Activity	Assessment methods
1. Infection control and relevant clinical practice standards are maintained.	TBL Self- reflections	• 360 degree feed back• Portfolio Assessment
2. Effective clinical leadership is Demonstrated	• Real life experiences and reflections	360 degree feedback Portfolio Assessment
3. Relevant data is clearly documented, securely stored and appropriately shared for quality improvement	Role Models Workplace-based self- practice	• 360 degree feedback • Portfolio Assessment
4. Effective triaging and time management structures are in place to allow timely provision of care	Simulations exercises Real life experience and reflections	• Portfolio Assessment
5. Patient confidentiality is managed appropriately	Case vignette Self reflections	• Portfolio Assessment
6. Shared decision making and informed consent are explained and obtained.	Real life experience and reflections TBL	• Portfolio Assessment
7. Medico-legal requirements are integrated into accurate documentation	Lectures and QA sessions Real life experiences and self-reflections PBL	MCQ SLEQ SAQ Portfolio Assessment

INTRODUCTION TO CONTENTS

The contents outlined in this section are in alignment with the learning outcome of the programme. The contents are categorized according to the departments in the teaching hospital (JDWNRH).

GENERIC CURRICULUM

The Generic Curriculum is designed to help resident doctors to develop competency in a number of areas including communication and consultation skills, patient safety and team work as well as the general principles and techniques of basic sciences including diagnostic and imaging and investigative medicine.

The resident doctors are also expected to develop and demonstrate a range of essential interpersonal and clinical skills for managing both acute and long term conditions, regardless of the specialty. The concepts defined in the Generic Curriculum should continue to be visited, reflected upon, and honed throughout the residency training programme and lifelong professional carrier.

Learning outcomes

At the end of this curriculum, the residents are expected to be able to:

- i. Identify the general and specific learning needs and outcome of the whole residency programme.
- ii. Apply the principles and techniques in basic sciences to clinical setting in the respective Specialty discipline.
- iii. Synthesize the process of history taking, clinical observations, investigations, diagnosis and treatment plans for proper and effective management of the patients.
- iv. Illustrate a range of essential interpersonal and clinical skills for managing patients with both acute and long-term conditions, regardless of the specialty.
- v. Demonstrate different aspects of medical ethics and etiquettes for strengthening professionalism and patient care.
- vi. Identify and address the legal and ethical issues as applicable to clinical practice and healthcare.
- vii. Provide leadership and management oversight in patient management with emphasis on intra-and inter-disciplinary team work.
- viii. Make independent clinical decisions with appropriate support.
- ix. Understand the principles and techniques in epidemiology, biostatistics and research and apply research in clinical practice to promote and strengthen evidence-based care.

TEACHING METHODS MODULE

MEDICAL HUMANITIES MODULE

Note: Above two modules will be delivered from term 2 to term 7 residency with compulsory attendance requirement of 90% to qualify for institute examination III.

QUALITY IMPROVEMENT PROJECT

CLINICAL COURSE CONTENT

General Surgery Learning outcome

The learning outcomes elaborated here are in alignment with the learning outcomes of the programme.

At the end of the training, the resident is able to:

- i. Accurately take detail history, perform physical examination, apply appropriate diagnostic techniques and arrive to a surgical diagnosis.
- ii. Perform initial management; communicate with surgeon, patient and relatives appropriately when referral is needed for surgical treatment.
- iii. Perform minor surgical procedures as outlined in the content.
- iv. Manage trauma patient conservatively when referral is not indicated.

Content outline

- i. The resident must demonstrate the following at the end of the training.
 - Management of shock
 - Management of wound & healing
 - Pain management
 - Recovery and mobilization planning
 - Approach to diagnosis and treatment of surgical illness
 - Assessment of surgical patient Nutrition
 - Fluid and electrolyte balance
- ii. The resident must be able to define, diagnose and manage (treatment or referral after initial management) the following conditions:
 - Skin and subcutaneous tissue
 - * Simple and complex
 - * Foreign bodies wounds
 - * Skin lesions
 - * Infected wounds
 - * Skin cancer (biopsy)
 - * Abscess, cellulitis
 - * Leg ulcer

- * Haematomas
 - * Burns
 - Head and neck
 - * Maxillofacial injury
 - * Head injury
 - * Injury to eye and ear
 - * Lumps in the neck
 - * Oral lesions & injury
- iii. The resident *must* demonstrate the competency in performing the following procedure at the end of the training.
- Suturing in most surgical situations
 - Wound debridement, drainage & excision in infected & contaminated wound
 - Abscess drainage
 - Haematoma drainage
 - Foreign body removal (superficial)
 - Excision of simple skin lesions
 - Skin biopsy
 - Burn dressing and simple graft, escharotomy
 - Cricothyroidotomy
 - Emergency tracheostomy

Maxillofacial

Learning outcome

The learning outcomes elaborated here are in alignment with the learning outcomes of the programme.

At the end of the training, the resident will be able to:

- i. Diagnose common dental and oral diseases and manage treatment in consultation with the dental unit of the hospital.
- ii. Identification of pre-malignant and malignant disease of oral cavity and referral to the specialist
- iii. Able to perform certain simple procedures as outlined in the content.

Content outline

- i. The resident should be actively involved in the management of the following conditions.
 - Temporal mandibular joint
 - dislocation
 - Post dental extraction
 - bleeding Gingivitis
 - Precancerous conditions
 - Oral malignant lesions
 - Syncope

- ii. The resident shall carry out the following procedures under supervision
 - Extraction of loose teeth
 - Reduction of TM
 - Drainage of pus/abscess dislocation
 - Maxillary/Mandibular nerve block

Procedural skills in ORL-HNS

The ORL-HNS residents must be able to demonstrate skills in the following procedures³¹ at the end of the training and maintain a log book as per the sample in appendix 1.

GENERAL SURGERY AND RECONSTRUCTIVE SURGERY

i. KNOWLEDGE

- To learn the historical perspectives of surgery.
- To learn the principles and techniques of surgery.
- To familiarize with the surgery equipment and machines.
- To learn about pre-operative evaluation of patient with or without co-morbid conditions
- To learn about the principles of oncology
- To learn about the principles of burn management and principles of cosmetic surgery

ii. SKILLS:

- Perform clinical history and examination in surgical practice
- Carry out pre-operative evaluation of patients.
- Carry out instrument arrangement and trolley layout.
- Demonstrate skills in sterilization techniques (O.T Layout and Asepsis).
- Perform skin Preparation-painting and draping
- Exhibit the techniques of scrubbing and gowning.
- Perform wound dressing and wound debridement
- Spine stabilization.

a. Pre-operative work-up

- * Ability for adequate pre-operative preparation in special situations like Diabetes, renal failure, cardiac and Respiratory failure etc. and risk Stratification
- * Communication skills with special reference to obtaining Informed Consent
- * Pre-operative assessment and preparation of patients including DVT prophylaxis, Blood transfusion and Antibiotics

b. Post-operative care

- * Airway management

³¹ Procedural skills in general practice vocational training [Internet]. afp. 2011 [cited 31 May 2016]. Available from:

<http://www.racgp.org.au/download/documents/AFP/2011/JanFeb/201101sylv ester.pdf>

- * Basic Physiotherapy
- * Management of postoperative hypo and hypertension
- * Postoperative pain control
- * Nutritional rehabilitation of patients
- * Fluid & Antibiotic management
- * Stoma care

DENTISTRY

- i. Learn about maxillofacial injury management
- ii. Cleft palate and cleft lip and its associated comorbidities like middle ear effusion
- iii. Basic dental care
- iv. oral ulcers management

SPEECH THERAPY

- i. learn basics of speech assessment
- ii. learn basics of speech therapy in vocal cord and laryngeal lesions
- iii. learn swallowing assessment and management of swallowing disorders

Audiology

- i. Learn Audiometry and interpretation, masking, tympanometry, Otoacoustic emission, brainstem evoked response audiometry and functional hearing loss evaluation

RADIOLOGY

- i. Learn principles of CT/ MRI/US and indications
- ii. Able to interpret CT/MRI/USG scans of Head and Neck
- iii. Use of contrast agent in radiological investigations
- iv. Role of PET scan in ORL – HNS

DOCTOR OF MEDICINE (MD) CURRICULUM

Otorhinolaryngology-Head and Neck Surgery

	1 st year		
General	Otology	Rhinology	Head and neck, pharynx and larynx
Administer informed consent History and examination Observe and practice infection control measures Communicate and collaborate with other departments Incident reporting Attend meetings, conference and make case presentation Thesis proposal and selection of topic Journal club presentation Pre operative preparation and post op management of all surgical cases Giving local anaesthesia and learn basic suturing techniques	Examination of ear with otoscope, endoscope and microscope Perform Tuning fork hearing test Removal of foreign body Aural toilet and wax removal Perform Dix Hallpike and Epley's mannuervre	Anterior and posterior rhinoscopy Diagnostic nasal endoscopy Perform olfactory test Anterior and posterior nasal packing Electrocauterization and chemical cauterization Removal of foreign body	Examination of head and neck, pharynx and larynx Perform flexible and rigid diagnostic endoscopy Cricothyrotomy Tracheostomy Drainage of peritonsillar abscess drainage Incision and drainage of superficial neck abscess
	2 nd year		
As in 1 st year Learn basic principles of imaging – x ray, CT,MRI,USG and PET Scan	Assist in common ontological surgeries Learn and perform common audiological test like PTA, OAE and tympanometry. Perform MNG Attend one temporal bone dissection course (conference)	Assist common rhinologicalprocedures Antral wash out Perform allergy skin prick test Drainage of septal abscess and hematoma Reduction of nasal bone fracture Attend one cadaveric FEES workshop (Conference) Perform endoscopic nasopharyngeal biopsy	Assist common head and neck surgeries Perform direct laryngoscopy Tonsillectomy Adenoidectomy Cervical Lymph node biopsy Excision of keloid and small superficial lesions Release of tongue tie / Frenectomy

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3 rd Year			
As in year 1 and 2 Posting in anesthesia, Dental unit, radiation oncology unit, outside country Thesis presentation Poster presentation	As in year 1 and 2 Attend one temporal bone dissection course (conference)	As in year 1 and 2 Attend one cadaveric FEES workshop (Conference)	As in year 1 and 2 Perform Direct laryngoscopy examination and biopsy Perform rigid oesophagoscopy for foreign body removal Management of laryngeal trauma, neck injuries Drainage of deep neck abscesses.
4 th year			
Teach junior residents and interns	Independently performs: Ear foreign body removal MNG Under direct supervision Tympanoplasty Removal of osteomas and exostosis Mastoidectomy Canaloplasty Meatoplasty Assist in other advance otologic surgeries	Independently performs: Epistaxis management Foreign body removal Under direction supervision Septoplasty Turbinoplasty FESS Endoscopic nasal polypectomy Assist in other advance rhinologic surgeries	Independently performs: Tonsillectomy Adenoidectomy Oesophagoscopy Direct laryngoscopy and biopsy Neck abscesses Tracheostomy Major neck trauma Facial injuries Epistaxis management Attend one head and neck cadaveric dissection course (conference) Under direct supervision Vocal cord polypectomy Excision of superficial skin malignancies Excision of branchial cyst, submandibular gland excision Sistrunk's surgery Perform rigid bronchoscopy for foreign body removal. Assist Thyroidectomies, parotidectomy, neck dissection, laryngectomy, maxillectomy and other head and neck oncological surgeries

Hospital Administration

Learning outcome:

The learning outcomes elaborated here are in alignment with the learning outcomes of the programme.

At the end of the training, the resident will be able to:

- i. Understand RCSC rules and regulations, financial rules and regulations and other aspects required for becoming the hospital leader in the district.

Content outline

The resident shall actively learn the following management principles applicable in the management of a district level hospital.

- i. Personnel management, work ethics
- ii. Human Resource Development.
- iii. Interpersonal relationship & communication.
- iv. Health economics.
- v. Health service accounting, auditing.
- vi. Financial management, Budgeting, work evaluation, work simplification, office management, system analysis.
- vii. Hospital organization- emergency, Inpatient department (IPD), OPD, disaster management preparedness
- viii. Medical store management, EDL.
- ix. Inventory.
- x. Quality
- xi. Accountability

Anesthesia

Learning outcome

The learning outcomes elaborated here are in alignment with the learning outcomes of the programme.

At the end of the training, the resident will be able to:

- i. Do pre-anesthetic assessment to certain level so that the resident can explain to the patient about anesthesia in general practice clinic.
- ii. Manage post – operative pain.
- iii. Manage all types of pain adequately in general practice.
- iv. Perform local anesthetic blocks for minor surgical procedures.
- v. Understand the principle of General, Regional and Local anesthesia.
- vi. Do simple procedures as outlined in the content.
- vii. Manage air-way

Content outline

- i. The resident should be able to describe the following:
 - Cardiopulmonary resuscitation (Basic and advanced cardiac life support)

- Pre-operative assessment
 - Pre-anesthetic prescribing
 - Initiation and maintenance of general anesthesia (including pharmacology of various general anesthetic agents)
 - Ketamine anesthetic
 - Local anesthesia and regional blocks
 - Post-operative recovery and monitoring
 - Pain management
- ii. The resident should observe and assist in the following procedures: -Airway management using facemask, oral airway and intubation.
- Regional anesthetic block: spinal, epidural and peripheral
 - Total intra venous Anesthesia (Ketamine anesthetic)
 - General anesthesia
- iii. The resident must be able perform the following procedures:
- Airway management using face mask, oral airway and intubation
 - Different local anesthetic blocks

Otorhinolaryngology-Head and Neck Surgery

			Requirement			
Number	Area	Entry	1yr	2yr	3yr	4yr
1	General	Understand patient and family's needs	y	y	y	y
2	General	explain informed consent	Y	y	y	y
3	General	Understand and execute the duty of confidentiality	y	y	y	y
4	General	Communicate and collaborate with other department team	y	y	y	y
5	General	Establish good relationship with other medical staffs	y	y	y	y
6	General	Educate junior residents			y	y
7	General	Collect and apply scientific background information	y	y	y	y
8	General	Research Presentation at meetings		Y	y	y
9	General	Acquire scientific and problem oriented way of thinking, study, and attitude to study continuation	y	y	y	y
10	General	Understand how to avoid and respond to medical incident	y	y	y	y
11	General	Understand and make incident reports	y	y	y	y
12	General	Able to present and discuss cases	y	y	y	y

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13	General	Attend to scientific meetings, positively	y	y	y	y
14	General	Understand medical laws and social insurance service	y	y	y	y
15	General	Understand medical welfare and social support system	y	y	y	y
16	General	Understand and execute under medical/life ethics	y	y	y	y
17	General	Understand and execute infection prevention measures	y	y	y	y
18	General	Understand prevention of damage by medical drugs and devices	y	y	y	y
19	General	Understand importance and the system of medical collaborations	y	y	y	y
20	General	Understand medical economics, and act under that	y	y	y	y
21	General	Understand and execute primary/community health cares (incl. cooperation between hospital-clinic/hospital-hospital, comprehensive care system, community healthcare system, and experience of health care in the local area)		y	y	y
22	Otology	Understand temporal bone anatomy	y			
23	Otology	Understand central auditory, vestibular and faical nerve pathway	y			
24	Otology	Understand external, middle and inner ear function	y			
25	Otology	Understand pathology of otitis media	y			
26	Otology	Understand pathology of hearing impairment	y			
27	Otology	Understand pathology of vertigo and vestibular dysfunction	y			
28	Otology	Understand pathology of facial nerve palsy	y			
29	Otology	Evaluate findings of outer ear and tympanic membrane	y	y		
30	Otology	Practice and evaluate audiometry	y	y		
31	Otology	Practice and evaluate vestibular tests	y	y		
32	Otology	Practice and evaluate tests for auditory tube function	y	y		
33	Otology	Evaluate imaging tests (CT, MRI) of temporal bone	y	y	y	
34	Otology	Understand the mechanisms of cochlear implasnt and speech therapy		y	y	y
35	Otology	Differential diagnosis of hearing impairment			y	y
36	Otology	Differential diagnosis of vertigo and vestibular dysfunction			y	y
37	Otology	Treatment and management of faical nerve palsy			y	y

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38	Otology	Treatment of hearing impairment and advice hearing aid			y	y
39	Otology	Treatment of vertigo and vestibular dysfunction, and advice of rehabilitation			y	y
40	Otology	Assistant fortympanoplasty	y	y		
41	Otology	Assistant for stapes surgery		y	Y	Y
42	Otology	Assistant of cochlear implantation		y	y	y
43	Otology	Understand complications and possible damage due to temporal bone surgery and postoperative management	y	y	Y	Y
44	Rhinology	Understand anatomy of nose and paranasal sinuses	y			
45	Rhinology	Understand functions of nose and paranaasal sinuses	y			
46	Rhinology	Understand pathology of nose and paranasal sinuses	y			
47	Rhinology	Understand pathology of allergic rhinitis	y			
48	Rhinology	Understand pathology of olfactory dysfunction	y			
49	Rhinology	Understand pathology of tumors of nose and paranasal sinuses	y			
50	Rhinology	Practice bacterial and fungal tests and tests for allergic rhinitis, and evaluate	y			
51	Rhinology	Practice nasal endoscope and evaluate	y			
52	Rhinology	learn olfactometry and evaluate	y	y		
53	Rhinology	learn rhinometry and evaluate	y	y		
54	Rhinology	Evaluate imaging tests (CT, MRI) of nose and paranasal sinuses	y	y	y	
55	Rhinology	Diagnosis of rhinosinusitis	y	Y		
56	Rhinology	Diagnosis of allergic rhinitis	y	y		
57	Rhinology	Diagnosis of nasal and paranasal sinus tumor	y	y		
58	Rhinology	Diagnosis of facial trauma	y	y		
59	Rhinology	Practice septoplasty and inferior turbinoplasty		Y	Y	Y
60	Rhinology	Practice sinus surgeries incl. polypectomy, ethmoid and maxillary surgeries		y	y	y
61	Rhinology	Assistant of tumors for nasal and paranasal surgeries		Y	Y	y
62	Rhinology	Treatment of epistaxis	y	y	y	y
63	Rhinology	Understand complications and possible damage due to nasal and paranasal sinus surgeries and postoperative management	y	y		

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64	Rhinology	Treatment of nasal and orbital bone fractures		y	y	y
65	Oropharynx	Understand anatomy of mouth, pharynx and salivary glands	y			
66	Oropharynx	Understand anatomy of larynx, trachea and esophagus	y			
67	Oropharynx	Understand function of tonsil	y			
68	Oropharynx	Understand physiology of feeding, mastication and swallowing	y			
69	Oropharynx	Understand physiology of breathing, phonation and speech	y			
70	Oropharynx	Understand pathology of taste dysfunction	y			
71	Oropharynx	Understand pathology of focal infection of the tonsil	y			
72	Oropharynx	Understand pathology of sleep apnea	y	y		
73	Oropharynx	Understand pathology of feeding, mastication and swallowing dysfunction	y	y		
74	Oropharynx	Understand pathology of phonation and speech dysfunction	y	y		
75	Oropharynx	Understand pathology of dyspnea	y	y		
76	Oropharynx	Practice and evaluate tests for taste	y	y		
77	Oropharynx	Practice and evaluate laryngeal endoscope	y	y		
78	Oropharynx	Evaluate results of tests for sleep apnea	y	y	y	
79	Oropharynx	Practice and evaluate endoscopic tests and video laryngoscope for swallowing	y	y	y	
80	Oropharynx	Practice and evaluate strbo-laryngoscopy and vocal function tests	y	y	y	
81	Oropharynx	Tonsillectomy, adenoidotomy	y	y		
82	Oropharynx	Removal of pharyngeal foreign body	y	y		
83	Oropharynx	Make treatment plan for sleep apnea		y	y	y
84	Oropharynx	Decide indication of rehabilitation or surgery for swallowing dysfunction			y	y
85	Oropharynx	Decide indication of rehabilitation or surgery for vocal dysfunction			y	y
86	Oropharynx	Laryngeal microsurgery			y	y
87	Oropharynx	Decision and practice emergency tracheostomy	y	y	y	y
88	Oropharynx	Tracheostomy and postoperative management	y	y		
89	H&N Tumor	Understand anatomy of head and neck region	y			

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90	H&N Tumor	Understand physiology of head and neck	y			
91	H&N Tumor	Understand pathology of inflammatory and infectious disease of H&N	y			
92	H&N Tumor	Understand pathology of congenital diseases of H&N	y			
93	H&N Tumor	Understand pathology of benign diseases of H&N	y			
94	H&N Tumor	Understand pathology of malignant diseases of H&N	y			
95	H&N Tumor	Evaluate physical examination of H&N	y			
96	H&N Tumor	Practice and evaluate endoscopic tests of H&N	y	y		
97	H&N Tumor	Understand indication and evaluate blood tests for H&N diseases	y	y		
98	H&N Tumor	Understand indication and evaluate imaging tests for H&N diseases	y	y		
99	H&N Tumor	Practice and evaluate histological tests of H&N diseases	y	y		
100	H&N Tumor	Apply TNM classification to H&N malignant tumors			y	y
101	H&N Tumor	Appropriate choice of treatment for H&N, in consideration of prognosis			y	y
102	H&N Tumor	Incision and drainage of neck abscess		y	y	y
103	H&N Tumor	removal of benign tumor and LN biopsy	y	y	y	
104	H&N Tumor	Surgery for early stage H&N cancer				y
105	H&N Tumor	Assistant of surgery for advanced stage H&N cancer and neck dissection	y	y	y	y
106	H&N Tumor	Postoperative management of H&N cancer	y	y	y	y
107	H&N Tumor	Decide indication of radiation therapy for H&N cancer			y	y
108	H&N Tumor	Understand and practice chemotherapy for H&N cancer			y	y
109	H&N Tumor	Understand necessity of supportive therapy and practice			y	y
110	H&N Tumor	Understand and deal with subsequent complication of H&N cancer treatment			y	y

FIELD POSTING

Learning outcome

The learning outcomes elaborated here are in alignment with the learning outcomes of the programme.

At the end of the training, the resident will be able to:

- i. Integrate clinical experiences from previous specialty rotations and be able to work competently in a district hospital.
- ii. Work with district health administration personnel and be familiar with local public health activities, including those at Basic Health Unit (BHU).
- iii. Demonstrate familiarity with the functions and activities of nongovernment organizations working in the district.
- iv. Demonstrate familiarity with community-based activities and initiatives in health, including the roles of Village Health Workers (VHW).

Content outline

The resident is able to describe and understand working system in district hospital and be able to apply the competencies acquired during earlier postings.

- i. Demonstrate clinical knowledge and skills commensurate with his level of training by managing cases presenting in district hospitals.
- ii. Be able to implement the principal strategies for addressing public health problems in the district, particularly those based on Primary Health Care concepts, including:
 - primary ear care and prevention of hearing loss early detection and prevention of cancer
 - Be able to describe the organization of the health care delivery system at the district level, including public health, clinical services and traditional medicine.
 - Be able to describe the role and function of non-government agencies operating in the district.
 - Be able to identify and refer those patients which require specialized hospital services.
 - Make contacts with BHU staff and assist them in making appropriate referrals to the district hospital.
 - Participate in the formal or non-formal (i.e. in-service) training of other health care workers and staff in the hospital, BHU and the community.

EXAMINATION SYSTEM AND OVERVIEW

Examinations	Schedule	Components		Total Marks	% Weightage*
		Written	Practical		
Term 1-2	End of term 1	Paper I – V (Each paper) MCQ: 50% SAQ = 5 marks * 10	OSPE = 20 stations * 3 mins = 100 marks	600	Exams = 10 % (CA = 5 %)*
Continuous assessment(CA)		Mini-Cex, DOPS, CBD, 360-degree feedback	log book/portfolio	100	
Term 3-4		Mini-Cex, DOPS, CBD, OSLER, 360-degree feedback	log book	100	(CA = 5 %)*
Institute Examination II	End of term 4	Paper I & II (Each paper) MCQs: 50 marks SAQ = 5 marks * 6 SLEQ = 10 marks *2	OSCE, 10 stations (5 mins each) 100 marks short case (2): 50 marks * 2 Long case (1): 100 marks (OSLER)	400	Exams = 20 %
Term 5-6		Mini-Cex, DOPS, CBD, OSLER, 360-degree feedback	log book/portfolio	100	(CA = 5 %)*
Submission of Thesis	End of term 6	Thesis content and Presentation: 25 marks each Oral /viva voce: 50 marks		100	Thesis = 20 % (CA = 5 %)*
Term 7-8		Quality improvement project during 7 th term (July-December) and submission to Dean's office through supervisor for QI project		100	(CA = 5 %)*
Continuous assessment(CA)		Paper I & II (Each paper) MCQs: 50 marks SAQ = 5 marks * 6 SLEQ = 10 marks *2	OSCE, 10 stations (5 mins) 100 marks short case (2): 50 marks * 2 Long case (1): 100 marks (OSLER)	500	Exams = 30 %
Institute Examination III	End of term 8				
Total Cumulative percentage				100 %	

Continues assessment (CA): Preferably by a faculty member but in special situations a senior resident can do as a part of peer assessment
CA: will be assessed 6 monthly basis (term)

*** Institute examination I, II, thesis and III are considered bar exams, a candidate must secure minimum of 50% separately in each theory paper, OSCE and Cases

Institute Examination I:

Paper I: Anatomy and Physiology

Paper II: Biochemistry, Pharmacology and General Pathology

Paper III: Emergency Medicine and Patient safety

Paper IV: Laboratory Medicine, Chemical Pathology and Radiology

Paper V: Biostatistics, Epidemiology and Research

Institute Examination II:

Paper I:

Paper II:

Submission of Thesis:

Thesis Defense Examination

Institute Examination III:

Paper I:

Paper II:

EVALUATION OF CURRICULUM

Curriculum evaluation will be approached as an ongoing process of continuous information collection and analysis to allow for a prioritization of quality improvement (QI) activities. At regular times, information will be collected from the stakeholders (residents, supervisors, course coordinator, University, Teaching Hospitals, Ministry of Health and District Health officials) with a view to detect where optimization of the quality of the programme is needed. As it will be impossible to engage in quality improvement processes over the whole range, prioritization of QI activities are needed and the curriculum evaluation will be used for this purpose. In line with the assessment strategy, we envision a curriculum evaluation programme that will use a variety of information sources to address the most pressing questions. We foresee a yearly cycle of Plan-Do-Check-Act.

The entire curriculum will be reevaluated every 5th year with the scope to incorporate and keep with the pace of recent development in the field of medical education in order to provide maximum learning opportunities to our learners.

Annexure: I

FoPGM/ENT-Portfolio 2018

Name:.....

Batch:

Placement:

Date from:

To:

Portfolio Assessment form: Global assessment of the 5 competency domains of learning

Portfolio Assessment Scale (Global ratings)		Domains of learning in ENT								
	Not learned = 1	Communication skills and patient-doctor relationship	Applied Professional Knowledge and Skills	Community health and context otolaryngology	Professional and ethical role	Organizational and legal dimensions and information technology/e-health				
	Needs further training = 2									
	Satisfactory = 3									
	Competent = 4									
	Mastery = 5									
Frequency Check (✓) as applicable		Assessor Check (✓) as applicable						Total Score	Average Score	Signature
Completion of Term/Rotation		Resident								
Completion of Term/Rotation		Specialist Supervisor								
At the end of assessment period	Term 1 Term 2-4 Term 5-6 Term 7-8	Course Coordinator								
Term Score (T)	Term 1 Term 2-4 Term 5-6 Term 7-8									

Guideline for assessors

The residents develop competency in cognitive, psychomotor and affective domains (described under five domains of ENT) and progress towards mastery. The milestones are colour coded as red, orange, green, blue and grey, representing as not learned, needs further training, satisfactory, competent and mastery respectively. The following descriptions under each domain shall guide the assessors while coding the milestones. Log books, formative assessment tools and professional judgments based on workplace assessment are used to code the milestones

Domain 1: Communication skills and patient-doctor relationship.

- i. Communication is clear, complete, respectful, empathetic and appropriate to the person and socio-cultural context.
- ii. Effective communication is used to elicit appropriate information from patients and caregivers.
- iii. Communicate with confidence and professionalism with family, caregivers and others involved in the care of the patient.
- iv. Complaints and concerns are taken positively and managed effectively establishing good rapport with patient and family.
- v. Ways in which health can be optimized and maintained are communicated to patients, family members and caregivers.

Domain 2: Applied Professional Knowledge and Skills

- i. Demonstrate relevant diagnostic and management skills in patients of all age groups and life stages.
- ii. Demonstrate holistic and patient-centered care.
- iii. Use evidence-based knowledge to manage disease conditions.
- iv. Familiar with relevant guidelines and SOPs.
- v. Able to remain informed and innovative.
- vi. Able to collaborate and coordinate care.

Domain 3: Community health and context of Otorhinolaryngology.

- i. The pattern and prevalence of disease are incorporated into screening and management skills purposes.
- ii. Demonstrate competency in routine community health activities.
- iii. The impact of social determinants are identified and addressed.
- iv. Current and emerging public health risks effectively managed.
- v. Barrier to equitable access to quality care are addressed.
- vi. Demonstrate effective leadership quality in the health care centers.

Domain 4: Professional and ethical role

- i. Adherence to relevant codes and standards of ethical and professional behavior.
- ii. Duty of care giver is maintained.

- iii. Critical incidents and potential critical incidents are identified and managed.
- iv. Professional knowledge and skills are addressed.
- v. Reflection and self-appraisal are undertaken regularly.
- vi. Personal health and wellbeing is evaluated.

Domain 5: Organizational and legal dimensions and information technology/e-health.

- i. Infection control and relevant clinical practice standards are maintained.
- ii. Effective clinical leadership is demonstrated.
- iii. Relevant data is clearly documented, securely stored and appropriately shared for quality improvement.
- iv. Effective triaging and time management structures are in place to allow timely provision of care.
- v. Patient confidentiality is managed appropriately.
- vi. Shared decision making and informed consent are explained and obtained.
- vii. Medico-legal requirements are integrated into accurate documentation.
- viii. uses technology to accomplish and document safe health care delivery

**360 degree feedback form
(Interpersonal and communication skills)**

Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and professional associates.

1. Assessment by: Self Others

2. Name of Resident:

Competency group: Communicates effectively to create and sustain a therapeutic relationship with patients and families					
	Not Applicable	Rarely demonstrates (<25-50% of the time)	Sometimes demonstrates (25% of time)	Demonstrates in most cases (50-75% of the time)	Demonstrates in majority of cases (>75% of the time)
Obtains historical information from appropriate individual (patient, caregiver, etc)	NA	1	2	3	4
Makes appropriate introductions and explains personal roles	NA	1	2	3	4
Respects privacy of patient/family by using various areas in facility for conversation, exams, etc	NA	1	2	3	4
Shows evidence of being able to sustain a continuing relationship with the patient	NA	1	2	3	4
Uses appropriate language at the proper developmental/educational level for the patient and/or caregivers/family members	NA	1	2	3	4
Uses a variety of techniques to elicit information from the patient	NA	1	2	3	4
Uses effective listening skills to elicit information	NA	1	2	3	4
Makes the patient comfortable enough to extract all necessary information when engaging in probing conversation	NA	1	2	3	4
Ensures the patient understands instructions	NA	1	2	3	4
Provides instructions to patients in a variety of ways	NA	1	2	3	4

Competency: Work effectively with others as a member or leader of a health care team or other professional group					
	Not Applicable	Rarely demonstrates (<25-50% of the time)	Sometimes demonstrates (25% of time)	Demonstrates in most cases (50-75% of the time)	Demonstrates in majority of cases (>75% of the time)
Familiarizes with the health care team member	NA	1	2	3	4
Shows respect to team members and provides information when needed	NA	1	2	3	4
Facilitates team communication when in role of team leader	NA	1	2	3	4
Assumes the role of consultant where appropriate	NA	1	2	3	4
Provides constructive verbal and written feedback to other members of the health care team	NA	1	2	3	4
Medical records are thorough, readable, and done on time	NA	1	2	3	4

Date evaluated:

Case based discussion (CbD)

1. Department:

2. Brief case description:

3. Setting: OPD Ward Emergency ICU

4. Degree of difficulty: Low Moderate High

5. Basis for case discussion:

Inpatient record Discharge summary OPD prescription

Please score the trainee on the scale shown. Please note that your scoring should reflect the performance of the student against that which you would **reasonably expect at their stage of training** and level of experience. Please mark 'Unable to Comment' if you feel you have not observed the behaviour.

Assessments	Well below expectation	Below expectation	Borderline	Meets expectation	Above expectation	Well above expectation	Unable to Assess
Clinical assessment	1	2	3	4	5	6	UTA
Investigations & referrals	1	2	3	4	5	6	UTA
Management plan	1	2	3	4	5	6	UTA
Follow up & future planning	1	2	3	4	5	6	UTA
Record keeping	1	2	3	4	5	6	UTA
Overall clinical judgment	1	2	3	4	5	6	UTA

Feedback

What went well?

Any suggestion for improvement

11. Assessor's Name and signature:

--

Trainee's reflection. What have I learnt? and Where I need to focus for improvement?

--

12. Trainee's name and signature:

Date: D/M/Y

--

Direct Observation of Procedural Skills (DOPS) form

1. Department:
2. Procedure:
3. Setting: OPD Ward Emergency
4. Conducted: on a patient during simulation exercise
5. Degree of difficulty: Low Moderate High
6. Reason for added difficulty:
7. Time pressure: Elective Critical
8. Number of times same procedure done before:

9. Assessment	Significant input required from assessor	Some guidance provided by assessor	Able to manage independently	Unable to assess
Clinical knowledge	<i>Understand indications and contraindication, understands relevant anatomy</i>			
	1	2	3	UTA
Consent	<i>Properly explain the procedure to patient and obtains informed verbal consent</i>			
	1	2	3	UTA
Preparation	<i>Properly explains the procedure and appropriately prepares for the procedure ensure assisting staff is present</i>			
	1	2	3	UTA
Infection control	<i>Demonstrates aseptic technique and follows universal precautions</i>			
	1	2	3	UTA
Technical ability	<i>Demonstrates manual dexterity and confidence; demonstrate adequate skill and practical fluency</i>			
	1	2	3	UTA
Patient interaction	<i>Communicates, reassures the patient, eye contact with patient for discomfort</i>			
	1	2	3	UTA
Insight	<i>Knows when to seek assistance, abandon procedure or arrange alternative care to prevent harm to patient</i>			
	1	2	3	UTA
Documentation	<i>Documents the episode including problems and complications; Clear post-procedure to the patients and staffs</i>			
	1	2	3	UTA
Team interaction	<i>Provides clear instructions to assisting staff and conveys relevant information concerning the patient and plans to team members</i>			
	1	2	3	UTA
Overall performance	1	2	3	

Feedback	
What went well?	
Areas that needed supervisory input	
Suggestions for getting greater independence	

11. Assessor's Name and signature:

Trainee's reflection on The procedure & learning

12. Trainee's name and signature:

Date: D/M/Y

**Mini – Clinical Evaluation
(Mini- CEX) Form**

Department: _____ Date: _____

Resident: _____ R-1 R-2 R-3 R-4

Patient Problem/Dx: _____

Setting: OPD Ward Emergency Other _____

Patient: Age: _____ Sex: _____ New Follow-up

Complexity: Low Moderate High

Focus: Data Gathering Diagnosis Therapy Counseling

Medical Interviewing skills (O Not Observed)	Facilitates patient’s telling of story; effectively uses questions/directionsto obtain accurate, adequate information needed; responds appropriately to affect, non-verbal cues.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Physical Examination Skills (O Not Observed)	Follows efficient, logical sequence; balances screening/diagnostic stepsfor problem; informs patient; sensitive to patient’s comfort, modesty.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Humanistic Qualities/ Professionalism	Shows respect, compassion, empathy, establishes trust;attends to patient’s needs of comfort, modesty, confidentiality, information.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Clinical Judgement (O Not Observed)	Selectively orders/performs appropriate diagnostic studies, considers risks,benefits.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Counseling Skills (O Not Observed)	Explains rationale for test/treatment, obtains patient’s consent, educates/ counselsregarding management.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Organization/Efficiency (O Not Observed)	Prioritizes; is timely; succinct.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Overall Clinical Competence (O Not Observed)	Demonstrates judgment, synthesis, caring, effectiveness, efficiency.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		

Mini-CEX Time: Observing _____ Mins Providing Feedback: _____ Mins

Evaluator Satisfaction with Mini-CEX

1 2 3 4 5 6 7 8 9 HIGH

Resident Satisfaction with Mini-CEX

1 2 3 4 5 6 7 8 9 HIGH

Feedback	
Which aspect of the encounter went well?	
Suggested areas of improvement?	

9. Assessor's name and signature:

10. Trainee's reflections on patient and areas of learning:

11. Trainee's name and signature

Date: D/M/Y

Note 1: Reprinted with permission from the American Board of Internal Medicine, www.abim.org.

Note 2: Discussed in: Norcini JJ, Blank LL, Arnold GK, Kimball HR. The mini-CEX (Clinical Evaluation Exercise): a preliminary investigation. *Ann Intern Med* 1995;123:795-9.

Note 3: General Practice Curriculum, KGUMSB,2016

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FoPGM Logbook 2018
Page No.

Name:.....Placement:

Date from:..... To:..... Term.....

Sl. No.	Date	Learning activity	Remarks (observed, Assisted, Performed, Attended, Presented, Participated etc)	Sig. of supervisor

OTORHINOLARYNGOLOGY (ENT2018)

Sl. No.	Date	Learning activity	Remarks (observed, Assisted, Performed, Attended, Presented, Participated etc)	Sig. of supervisor

ANNEXURE II

GENERIC CURRICULUM

Content outline

The resident doctor, irrespective of discipline enrolled, must be able to describe and apply the values during training and throughout the professional life (KGUMSB, 2016)

MEDICAL EDUCATION: (30 Hours)

FUNDAMENTALS OF BASIC SCIENCE

- I. Fundamental principles and applications of anatomy
- II. Fundamental principles and applications of physiology
- III. Fundamental principles and applications of biochemistry
- IV. Fundamental principles and applications of pharmacology
- V. Fundamental principles and applications of pathology

BASIC LIFE SUPPORT AND ADVANCE CARDIAC LIFE SUPPORT SKILLS

BLS

- I. Key changes in basic life support, reflecting the new science from the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
- II. Critical concepts of high-quality CPR
- III. The American Heart Association Chain of Survival
- IV. 1-Rescuer CPR and AED for adult, child and infant
- V. 2-Rescuer CPR and AED for adult, child and infant
- VI. Differences between adult, child and infant rescue techniques
- VII. Bag-mask techniques for adult, child and infant
- VIII. Rescue breathing for adult, child and infant
- IX. Relief of choking for adult, child and infant
- X. CPR with an advanced airway

ACLS

- I. Key changes in advanced cardiovascular life support, reflecting the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
- II. Basic life support skills, including effective chest compressions, use of a bag-mask device and use of an AED
- III. Recognition and early management of respiratory and cardiac arrest
- IV. Recognition and early management of peri-arrest conditions such as symptomatic bradycardia
- V. Airway management
- VI. Related pharmacology
- VII. Management of acute coronary syndromes (ACS) and stroke
- VIII. Effective communication as a member and leader of a resuscitation team
- IX. Effective Resuscitation Team Dynamics

RADIO-DIAGNOSIS AND IMAGING**Plain Radiographs**

- I. Identify normal anatomy on PA, AP, and lateral chest films
- II. Recognize abnormal chest films including pleural effusion, pneumothorax, pneumonia and lobe location, changes of congestive heart failure, changes of chronic obstructive pulmonary disease, atelectasis, pulmonary nodules and masses, and hyaline membrane disease of the newborn
- III. Identify normal anatomy on four views of the abdomen
- IV. Recognize abnormal abdominal films including ileus, small bowel obstruction, large bowel obstruction, free air, and calcifications
- V. Identify normal anatomy of the spine and long bones in both adults and children
- VI. Recognize abnormal bone radiographs including fractures, degenerative joint disease, osteoporosis (including vertebral collapse), and primary versus metastatic bone malignancy
- VII. Identify normal anatomy on barium enema, and upper gastrointestinal series

Computed Tomography

- I. Recognize and treat contrast allergy, its signs and symptoms, and implications to the patient
- II. Discuss principles of CT function and applications
- III. Discuss differences between CT, MRI, plain film, and US, including the comparative benefits/drawbacks, strengths/weaknesses of each modality
- IV. Discuss general indications of when to use CT as the imaging of choice
- V. Identify normal anatomy found on CT of the head, spine, chest, abdomen, and pelvis
- VI. Recognize abnormal head CTs including acute hemorrhage infarcts, edema, mass effect, and hydrocephalus in an infant and adult
- VII. Recognize abnormal chest CTs including pulmonary nodules and masses
- VIII. Recognize abnormal abdominal/pelvis CTs including diverticular disease, appendicitis, bowel obstruction, abdominal aortic aneurysms, pancreatitis, abdominal abscesses, ascites, and hepatic, pancreatic and renal masses
- IX. Recognize abnormal CTs of the spine, including metastatic disease, degenerative joint disease, and disc disease.

Magnetic Resonance Imaging

- I. Discuss principles of magnetic resonance imaging, including differences in abilities and applications of MRI versus CT
- II. Identify normal anatomy on MRI of the head and spine
- III. Recognize abnormal head and spine MRIs including central nervous system infection, masses, stroke syndromes, multiple sclerosis, disc disease, metastatic vertebral column disease, and cord compression

Ultrasound

- I. Discuss general principles of ultrasound including the differences between 2D, Doppler, and M mode
- II. Discuss indications and limitations of
 - a. ultrasound for specific OB/Gyn situations (molar pregnancy, anencephalic pregnancy, placenta previa, fetal age using biparietal diameter and femur length, and ectopic pregnancy)
 - b. vascular Doppler ultrasound (aneurysm, deep vein thrombosis, and carotid artery and peripheral vascular disease)
 - c. ultrasound for gallbladder, bile ducts and liver
 - d. echocardiogram (transthoracic versus transesophageal echocardiography, chamber size, valvular disease, and pericardial effusions)
 - e. renal ultrasound for cysts and tumors
 - f. prostate ultrasound (for evaluation of nodules and biopsy)
 - g. FAST ultrasound for trauma.

Mammography

- I. Discuss basics of normal and abnormal mammograms
- II. Discuss indications and utility of mammography, including usefulness as a screening method and as a surgical tool for resection and biopsy.

Nuclear Medicine

- I. Discuss general principles and therapeutic uses of nuclear medicine
- II. Discuss mechanisms, indications, and limitations of HIDA scans, bone scans, tagged RBC scans, myocardial perfusion and function scans, bone densitometry scans, and ventilation/perfusion scans.

Angiography

- I. Discuss diagnostic and therapeutic principles of angiography
- II. Discuss indications for obtaining angiograms
- III. Discuss applications and utility of MRA angiograms
- IV. Recognize normal anatomy of the great vessels and other vasculature on angiograms
- V. Discuss indications for angiograms for abnormal processes including subarachnoid hemorrhage and berry aneurysms, vascular stenotic lesions, pulmonary angiogram for PE, aortic dissection, aortic trauma, and gastrointestinal bleeding

Become familiar with the various treatment modalities provided by interventional radiologists

- I. Ultrasound-guided vascular access
- II. Paracentesis
- III. Thoracocentesis, chest tube insertion and management
- IV. Ultrasound-guided cyst aspirations and soft tissue biopsy

- V. Embolization procedures
- VI. Vertebroplasty
- VII. Vascular stenting
- VIII. Thyroid ablation therapy
- IX. Thrombolytic therapy for PE/DVT

LABORATORY MEDICINE

Foundations of Laboratory Medicine

- I. Concepts of diagnostic sensitivity and specificity of a laboratory test to a specific clinical situation; negative and positive predictive values, situations in which predictive values provide critical information for developing patient care screening, diagnostic, prognostic, and therapeutic pathways/algorithms;
- II. How reference intervals are derived and used and the different types of reference intervals, including those derived from population distributions, from expert consensus recommendation, or from evidence-based determination of “threshold” values based on a test’s predictive value in a clinical algorithm; how reference intervals may be compartmentalized by age, sex, race, clinical state (eg, pregnancy);
- III. Concept of variability in repeated measurements, as well as variability within and between individuals; describe the contributors to analytical uncertainty (precision, accuracy, bias, coefficient of variation);
- IV. Discuss the long-reaching consequences of ordering unnecessary testing; consider whether routine daily monitoring tests constitute unnecessary testing; based on an understanding of reference intervals, explain why unnecessary testing may lead to higher health care costs and increased risk for the patient; similarly, discuss the consequences of failing to utilize noninvasive or minimally invasive diagnostic procedures before proceeding to invasive approaches (tier 1).
- V. Distinction between testing appropriate to the clinical laboratory and those relating to research environment;
- VI. External and internal validation of clinical laboratory tests;

Chemical Pathology and Immunology

- I. Basic principles of toxicology - the diagnosis and management of common clinical toxicology scenarios (eg, overdoses of acetaminophen, antidepressants, salicylates, ethylene glycol, ethanol, opiates, methanol);
- II. Interpretation of the results of “drugs of abuse” panels, including causes for false positive and false negative tests, the role of confirmatory testing, and the impact of specimen adulteration;
- III. Principles of therapeutic drug monitoring, including the determination of peak and trough levels vs random drug levels;
- IV. Uses of metabolic testing, including electrolytes, acid-base balance, osmolality, and blood gases; interpret results for the above tests;
- V. Tests relevant to diagnosis of myocardial infarction and acute coronary syndrome,

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- cardiovascular and stroke risk, and congestive heart failure;
- VI. Criteria for the laboratory diagnosis of diabetes mellitus and biochemical changes that are seen in diabetic ketoacidosis and nonketotic hyperosmolar coma;
- VII. Evaluation of renal function, and criteria for chronic kidney disease; review basic microscopic urinalysis, and describe key abnormal findings;
- VIII. Laboratory evaluation of hepatic, pancreatic, and gastrointestinal tract pathology;
- IX. Common tests used for plasma protein analysis, including total protein, albumin, serum protein electrophoresis, and immuno-fixation electrophoresis and their disease-specific relevance;
- X. Laboratory tests available for the evaluation of organ-specific and systemic autoimmune diseases, vasculitides, and immuno-deficiencies, including autoantibody testing, serum complement levels, and basic immuno-phenotyping of lymphocyte subpopulations;
- XI. Role of testing for tumor markers, including the differences in their uses for screening, diagnosis, prognosis, and therapeutic monitoring;
- XII. Tests available for use in reproductive biology, both prenatal and postnatal
- XIII. Common approaches used in endocrinology testing, including pituitary-adrenal, parathyroid, and thyroid testing; stimulation and suppression test physiology and interpretation.

Molecular Diagnostics

- I. General principles of molecular diagnostics testing in the screening, diagnosis, and/or monitoring of infectious, genetic, and oncologic diseases; describe the place of pharmacogenetic testing in clinical care;
- II. Legal, ethical, and social implications of genetic testing (see law and ethics module);

Hematology

- I. Methods for determination of the complete blood count, including measured vs calculated values, indications for manual vs automated leukocyte differential, and important interferences;
- II. Physiology of normal hematopoiesis and the erythrocyte, leukocyte, and platelet response to pathologic stimuli;
- III. Significance of erythrocyte, leukocyte, and platelet morphologic variations on the peripheral smear; know the types of leukocytes defined in the differential and their significance;
- IV. Laboratory evaluation and differential diagnosis of anemia, erythrocytosis, leukopenia, leukocytosis, thrombocytopenia, and thrombocytosis;
- V. Laboratory evaluation, both cellular and chemical, of body fluids, including urine and cerebrospinal, pleural, peritoneal, pericardial, and joint fluid;
- VI. Physiology of coagulation, including the mechanisms of action of naturally occurring and therapeutic anticoagulants;
- VII. Laboratory tests used to diagnose common bleeding and thrombotic disorders, including the hemophilias, platelet disorders, von Willebrand disease, and

- acquired bleeding diatheses; describe appropriate testing strategies for monitoring hemostatic and anticoagulant therapies;
- VIII. Evaluation of hemoglobinopathies, and be able to diagnose common hemoglobinopathies such as sickle cell disease when presented with patient data;
- IX. General principles of flow cytometric, molecular, and cytogenetic approaches used in the evaluation of leukemias, lymphomas, and related neoplastic disorders;

Microbiology

- I. Describe the pre-analytic variables that determine the quality and yield of microbiologic testing:
 - a. presence of normal microflora on skin and mucous surfaces;
 - b. presence of contaminants in samples and the effect on culture results;
 - c. effects of sample collection techniques, specimen transport media, timing, and storage conditions;
 - d. importance of sample volume in identifying pathologic organisms in normally sterile sites that may be present in very low concentrations;
 - e. effects of timing of samples to increase the recovery of various pathogens; and describe how the microbiologic workup depends on the site/samples submitted to the laboratory, and describe the basics of optimizing this workup;
- II. Most frequent agents (bacterial, viral, fungal, parasitic) causing infections in different body sites or systems; and how an understanding of bacterial, parasitic, and viral pathogenesis impacts sample choice and test interpretations;
- III. Factors affecting turnaround time in microbiologic workups, eg, fastidious organisms requiring special media and longer incubation times, as well as unusual tests performed infrequently;
- IV. Explain the use and limitations of stains as rapid diagnostic tools; understand the use of Gram stain on sites/samples that may contain normal flora, as well as those from normally sterile body sites;
- V. Use and limitations of serology in infectious diseases, to establish immune status, to diagnose acute infection, and as a retrospective means to support diagnosis; recognize the need for the use of paired serology (acute and convalescent phase samples) and for screening and confirmatory methods (such as those used in syphilis); explain why the time course and nature of serologic response is critical in the diagnosis of common disorders, eg, viral hepatitis and HIV;
- VI. Mechanisms of action of antimicrobial drugs of different classes; interpret the antimicrobial susceptibility report ;
- VII. Mechanisms of bacterial resistance to antimicrobials and the spread of resistant organisms in institutions; describe the role of health care providers and of hospital epidemiology and other monitors of infection control in the hospital and the community;

Transfusion Medicine

- I. Explain the following:
 - a. the blood components available for clinical use;
 - b. the recommended and evidence-based thresholds and indications for transfusion of the various blood components;
 - c. the appropriate evidence-based dosing of blood components;
 - d. the types of recombinant and other “blood component substitutes” available; and
 - e. the alternatives to allogeneic blood product infusion (eg, hematopoietic cytokines, autologous donations, and intraoperative blood salvage);
- II. Lifespan of transfused platelets, red blood cells, and the clotting factors present in plasma and how the efficacy of transfusion is monitored by laboratory testing (eg, expected hemoglobin and platelet count increments);
- III. Pathophysiology, presentations, and acute management (and prophylaxis) of the different types of transfusion reactions;
- IV. Common infectious disease risks of blood products that remain despite donor screening and blood product testing, including current data on transfusion-transmitted disease incidence and prevalence;
- V. Importance of blood specimen labeling, with an emphasis on the impact transfusion errors have on patient morbidity and mortality; and the process of issuing and administering blood products, including required patient safety checks, required infusion times, and appropriate blood product storage limitations once products are issued from the blood bank (tier 1).
- VI. Meaning of and rationale for type and screen (type and cross-match) for blood products and the time limits of such testing; explain the appropriate settings and processes for emergency release of blood and the use of “universal donor” blood;
- VII. Define “massive transfusion,” and describe the special needs of the patients in terms of metabolic derangements and the administration of blood products;
- VIII. Various kinds of blood donors (eg, autologous, directed, altruistic) and the important elements of screening pre-donation;
- IX. Clinical use of therapeutic phlebotomy; various types of apheresis procedures, and examples of how each is used;
- X. The HLA system and its role in transfusion and transplantation;

INFECTION CONTROL

- I. Concept of infection prevention and control
- II. Common misconceptions of infection prevention and control
 - a. Incidence of infections at the health care facility
 - b. Prevalence of infections in the community
 - c. How infections are transmitted
 - d. HIV and HBV
 - e. Use of screening
 - f. Feasibility of adhering to appropriate infection prevention and control practices

- III. Need for infection prevention and control in the
 - a. Health care facility
 - b. Home
 - c. Community
 - d. Individual
 - e. Institution
 - f. Home
 - g. Community
 - h. Consequences of non-compliance
- IV. Levels of responsibility.
- V. Definitions:
 - a. Acute care settings
 - b. Ambulatory care settings
 - c. Long-term care settings
 - d. Home-based care
 - e. Community-based care
 - f. Standard Precautions
 - g. Transmission-Based Precautions
 - h. Isolation
- VI. Common infections in each care setting and methods of prevention
- VII. Factors predisposing staff, patients, families, and visitors to infection
- VIII. Description and methods of
 - a. Standard Precautions
 - b. Transmission-Based Precautions
 - c. Isolation
- IX. Antisepsis
 - a. Definition
- X. Antiseptics
 - a. Types and their uses
- XI. Principles of
 - a. Decontamination
 - b. Cleaning
 - c. Disinfection
 - d. Sterilization
- XII. Categories of disinfectant, their uses and limitations
- XIII. Calculation of strengths of disinfectants
- XIV. National standards and regulations governing infection prevention and control in health care facilities, homes and communities
- XV. Barriers to implementation
 - a. Lack of knowledge
 - b. Misunderstanding of associated risks
 - c. Inadequate equipment and supplies
 - d. Poor supervision
 - e. Other

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- XVI. Quality assurance process
 - a. Definition
 - b. Standards
 - c. Indicators
 - d. Audit

PATIENT SAFETY

- I. Definition of terms
- II. What is patient safety
- III. What are human factors and why is it important to patient safety?
- IV. Understanding systems and the impact of complexity on patient care
- V. Being an effective team player
- VI. Understanding and learning from errors
- VII. Understanding and managing clinical risk
- VIII. Introduction to quality improvement methods
- IX. Engaging with patients and carers
- X. Minimizing infection through improved infection control
- XI. Patient safety and invasive procedures
- XII. Improving medication safety

MEDICAL LAWS AND ETHICS

- I. Medical Law and Ethics
 - a. Importance in the ambulatory healthcare settings
 - a. Codes of Ethics
 - b. Confidentiality
- II. Medical Practice Management
 - a. Group practices
 - b. Managed Care
 - c. Liabilities
 - d. Licensures, certifications, and registrations.
- III. Liability and Duties
 - a. Types of law- national and international
 - a. Controlled substances
 - b. Contracts
 - c. Statute of Limitations
 - d. Consent
- IV. Workplace Issues
 - a. Medical records
 - b. Employment practices
 - c. Legal implications
- V. Bioethical Issues
 - a. Ethical Issues in Biomedical research
 - b. Life, Death, and Dying and legal documents

BASIC EPIDEMIOLOGY

Principles of epidemiology

- I. Definition
 - a. Epidemiology
 - b. Epidemiology approach
 - c. Uses of epidemiology
- II. Phases of epidemiology approach
 - a. Descriptive epidemiology
 - ◇ What is the problem
 - ◇ Frequency of the problem
 - ◇ Who is involved
 - ◇ Where is the problem
 - ◇ When did it occur
 - b. Analytic epidemiology
 - ◇ Analysis of causes of disease
 - c. Experimental epidemiology
 - ◇ Clinical or community trials
 - d. Evaluation epidemiology
 - ◇ Measuring the effectiveness of different health services
- III. Key components of epidemiology data
 - a. What
 - b. Who
 - c. Where
 - d. When
 - e. How
 - f. Why
- IV. Sources of epidemiology data
 - a. Census
 - b. Vital statistics
 - c. Morbidity data
 - d. Mortality data
 - e. Reports of notifiable diseases
 - f. Hospital records
 - g. Private physicians' offices
 - h. Disease registers
 - i. Community
 - j. Other
- V. Measurements and their calculations
 - a. Ratios
 - b. Proportions
 - c. Incidence rates
 - d. Prevalence rates
 - e. Demographic rates

- VI. Relationship between predictive value and disease prevalence
- VII. Screening
 - a. Definition
 - b. Screening tests
 - c. Validity and reliability of screening tests
 - d. Screening programmes
- VIII. Surveillance
 - a. Definition
 - b. Methods
 - c. Approaches
- IX. Preparation of tables and graphs
 - a. Graphs
 - b. Histograms
 - c. Population pyramids
 - d. Bar charts
 - e. Pie charts
 - f. Scatter diagrams
 - g. Maps.

Infectious disease process

- I. Definition
 - a. Carrier
 - b. Endemic
 - c. Epidemic
 - d. Pandemic
 - e. Immunity
 - f. Immune response
 - g. Herd immunity
 - h. Immunoglobulins
 - i. Host response
 - j. Hypersensitivity
 - k. Infection
 - l. Infectivity
 - m. Pathogenicity
 - n. Virulence
 - o. Immunogenicity
 - p. Sporadic
- II. Dynamics of disease transmission
 - a. Chain of infection
- III. Classification of the mechanisms of disease transmission
 - a. Contact transmission
 - b. Direct transmission
 - c. Indirect transmission

- d. Droplet transmission
- e. Airborne transmission
- f. Common vehicle transmission
- g. Vectorborne transmission
- IV. Description
 - a. Immunity
 - b. Host response
 - c. Herd immunity
 - d. Carrier
- V. Nosocomial infection
 - a. Definition
 - b. Modes of transmission
 - c. Preventive measures
- VI. Risk factors for the occurrence of communicable diseases among population groups
 - a. Extremes of age
 - b. Presence of underlying disease/infection
 - c. Natural/Passive immunity
 - d. Trauma/Invasive procedures
 - e. Medications
 - f. Lifestyle
 - g. Cultural
 - h. Socio-economic
 - i. Environmental
 - j. Organization of health services

RESEARCH AND BIostatISTICS

Research methods

- I. Definition of common terms and concepts used in research
 - a. Quantitative research
 - b. Qualitative research
 - c. Variable
 - d. Subject
 - e. Sampling
 - f. Population
 - g. Pilot study
 - h. Validity
 - i. Reliability
 - j. Bias
- II. Types of research
 - a. Historical
 - b. Descriptive
 - c. Experimental
- III. Basic research process

- a. Identification of problem
 - b. Statement of problem
 - c. Definition of terms
 - d. Statement of hypothesis
 - e. Identification of assumptions
 - f. Literature search
 - g. Definition of setting: geographical, population, etc.
 - h. Definition of population to be studied
- IV. Problem statement
- a. Characteristics of a problem statement
- V. Methods of sampling and collection
- a. Sampling methods
 - b. Probability methods
 - c. Non-probability methods
 - d. Data collecting methods
 - ◇ Questionnaire
 - ◇ Interview
 - ◇ Observation
 - ◇ Focus group discussion
 - ◇ Document search
- VI. Principles of data collection, analysis, and interpretation
- a. Pre-testing of instrument
 - b. Validity
 - c. Reliability
 - d. Control for bias
 - e. Statistical analysis
 - f. Interpretation
 - ◇ Meaning
 - ◇ Limitation
 - ◇ Usefulness
- VII. Strengths and limitations of sources of health data
- a. Organizing data
 - b. Analyzing data
 - c. Interpreting data
 - d. Implications of findings
 - e. Limitations
 - f. Summarizing
 - g. Conclusion
 - h. Recommendations
- VIII. Ethical and legal issues relevant to research
- a. Consent
 - b. Benefits

- c. Confidentiality
- d. Acknowledgement
- e. Other
- IX. Research methods relevant to clinical practice
 - a. Surveys
 - b. Case studies
 - c. Experiments
 - d. Case-control studies
 - e. Cohort studies
- X. Design a research proposal in one's area of practice or related fields
- XI. Writing the research report
- XII. Presentation of study.

Biostatistics

- I. Definition of terms
 - a. Statistics
 - b. Biostatistics
 - c. Vital statistics
 - d. Descriptive statistics
 - e. Inferential statistics
- II. Purposes of statistics
 - a. Summarization of data
 - b. Comparison of data sets
 - c. Research methodologies
- III. Types of statistics
 - a. Descriptive
 - b. Inferential
- IV. Uses of statistics in clinical practice /public health
 - a. Surveillance
 - b. Presentation of data
 - c. Epidemiology
 - d. Identification of public health problems
 - e. Policy analysis and formulation
 - f. Planning
- V. Calculation of the following measures of central tendency
 - a. Mean
 - b. Median
 - c. Mode
- VI. Measures of variation and their calculation
 - a. Range
 - b. Variance
 - c. Standard deviation
- VII. Theoretical distribution of variables

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- a. Normal distribution
 - b. Binomial distribution
- VIII. Relationship between sample statistics and population parameters
- a. Sample mean and population
 - b. Sample proportion and population proportion
- Sample variance and population variation

