



Occupational Mapping Report: Allied Health and Paramedic Sector

Health Sector Skill Council

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Introduction

Context of Development of National Occupational Standards in India

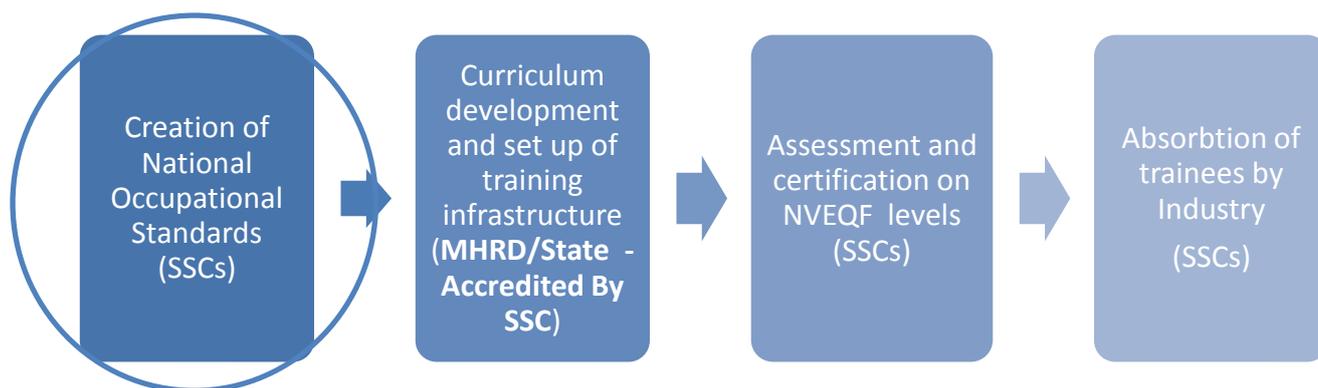
The National Skill Development Policy 2009 mandates that the National Skills Development Council (NSDC) would constitute Sector Skill Councils (SSCs). The SSCs are established to complement the existing vocational education system for the industry sector in meeting the entire value chain's requirements of appropriately trained manpower in quantity and quality across all levels on a sustained and evolving basis.

It is worthwhile to note that the SSCs in India are envisaged taking into account the ground realities as well the international best practices as described above.

SSCs are national partnership organisations that bring together all the stakeholders – Industry, labour, and the academia, for the common purpose of workforce development of particular Industry sectors.

The SSC is envisaged to develop the skill ecosystem in the country as shown below:

Figure 1: Skills Ecosystem



Each SSC will create a repository of Occupational Standards for its respective sectors, so as to develop the relevant content, training infrastructure, and other related needs for imparting the training. The SSCs are also responsible for assessment and certification at all the NVEQF levels as described in the next section. It is envisaged that the SSC for a particular sector would be the supreme certification body for that sector. Since the SSC as an industry/sector body can link the skilling eco-system to the demands of the industry/sector, this will ensure that the content, assessment, certification etc. is relevant to the Industry. With people trained under this framework, it can be visualized that there would be Industry absorption and retention.

Occupational Standards

Occupational Standards (OS) are statements of the standards of performance individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding. OS describe what an individual needs to do, know and understand in order to carry out a particular job role or function.

As discussed above, OS are an essential part of the responsibilities of SSCs that are being developed to transform the skilling industry in the country. The SSCs are mandated to develop the OS for their respective sectors with financial support from NSDC. The OS serve a number of purposes as shown in the figure below.

Figure 2: Uses of Occupational Standards



Once developed, it is easy to define a focused training and development eco-system based on OS.

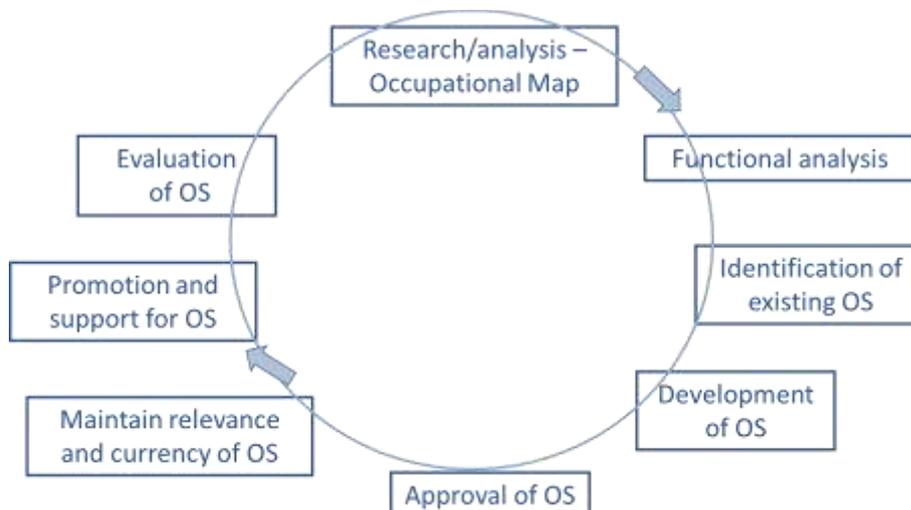
The National Occupational Standards will also help in:

- Defining a job description for a job role
- Providing measurable performance outcomes for individual performance appraisals
- Devising appropriate recognition programs
- Defining competency frameworks
- Providing support for career planning and progression

OS Development Framework

The following framework¹ has been used for OS development:

Figure 3: OS Development Framework



As indicated in the OS Development Framework above, the outcome of Occupational Mapping will feed into the next steps viz. Functional Analysis and OS Development.

Objective of the Report

An occupational map is essentially a report that describes the nature and characteristics of a sector; the key areas; numbers of people employed; the trends and skills required - now and in the future. It is a 'snapshot' of the sector as it currently stands.

The information from this helps to assess the viability of developing standards and qualifications and their potential place in the qualification framework. The information is also used to plan the development of national occupational standards for the sector.

As well as providing a solid research base, this analysis helps NOS developers to:

- Develop an internal or external business case for NOS development and/or review
- Identify a representative sample of employers to engage in NOS development and/or review
- Identify other key stakeholders who could be helpful in the development and/or review process

This Occupational Mapping report covers:

- The size and profile of the Allied Health sector
- Business and workforce characteristics
- Spatial distribution of organisations and workers

¹ Source: INSSO framework followed globally as a benchmark for OS development

- The number of people working in the sector by occupation and gender
- Key trends, developments and drivers within the sector
- Sector skills gaps and shortages
- The types of occupations within the sector
- The main qualifications of people working in each occupation
- Opportunities for progression and typical career routes

Approach and Methodology

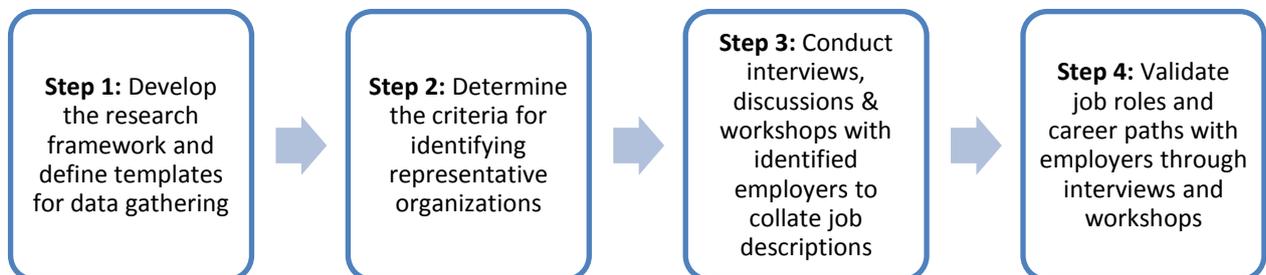
The occupational mapping is the key to kick start the development of OS for any sector or any job role. The occupational mapping entailed an entire industry scan to identify the occupations across the Allied Healthcare and Paramedics sector.

Key objectives:

- Identify all job roles/occupations across Allied Healthcare and Paramedics sector and sub-sectors
- Career progression path from entry level to senior management level
- Identify entry level employment opportunities and demand-supply gaps
- Map vertical and horizontal mobility across Allied Healthcare and Paramedics sector

Occupational mapping comprises of a four step approach based on robust validation process and industry representation by the key players.

Figure 4: Approach and Methodology



Step 1: Develop the research framework and define templates for data gathering

A robust research framework was developed that includes a mix of primary and secondary research². The methodology undertaken for the Occupational Analysis is depicted below for three broad activities

² Primary research involves data collected as part of the project by the Project Team
Secondary research involves leveraging data

Figure 5: Framework establishing approach and scope of Occupational Mapping



Step 2: Identification of organisations to be researched

The industry players in the Healthcare in particular those that employ allied healthcare and paramedics were identified for developing and validating the framework. Healthcare delivery is typically segmented into primary, secondary and tertiary healthcare. In addition in India there is a mix of public and non-public centres for delivery of healthcare which was considered while identifying representative organizations.

- Primary healthcare is the first point of care for most patients. These are generally outpatient facilities; in the public sector these would be the primary healthcare centres and in the non-public sector mainly comprise medical clinics
- Secondary healthcare provides treatment for serious illness or injury but only for a brief period. These organizations have facilities like intensive care, medical imaging and diagnostic facilities. These are typically hospitals with 50 – 300 beds like a district hospital
- Tertiary healthcare provide complex medical and surgical treatments in areas like neurosurgery, cancer, cardiac surgery amongst others. These would be hospitals in excess of 300 beds

We covered over 45 institutions across the spectrum of healthcare providers including:

- Public Sector Hospitals
- Large Private Multispecialty Hospitals
- Mid-size Private Hospitals
- Laboratories
- Teaching Hospitals

These institutions were covered to better understand the segment in terms of growth potential and their requirements of paramedical staff.

Discussions were held with over 100 doctors, nurses, hospital administrators, human resources personnel and allied health staff. A list of persons contacted during this study is attached in Annexure 1: List of Persons Consulted.

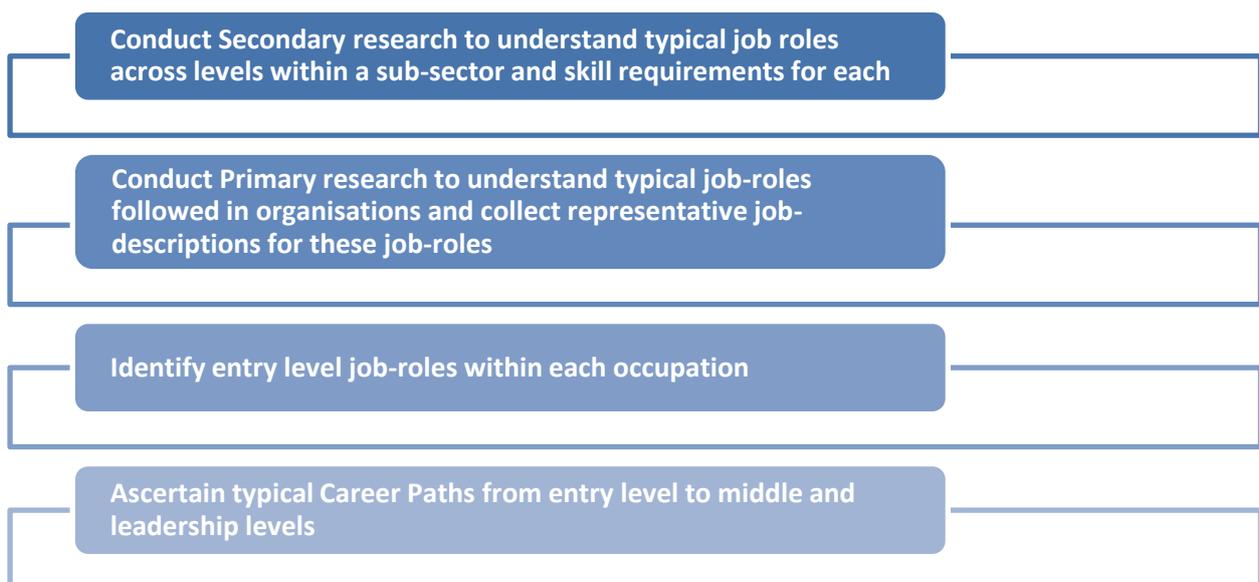
Step 3: Discussions with identified experts and decision makers through focused group discussions, personal interviews and workshops

Occupational Analysis (Occupational Mapping and Career Paths) was conducted with inputs from subject matter experts and people in HR, Recruitment, Learning and Development from the various organisations.

Critical inputs helped identify the typical job-roles at the entry, middle, and leadership levels and the possible vertical and horizontal career paths within the specified sub-sector or occupation.

The following activities were undertaken for Occupational Analysis:

Figure 6: Approach for Primary and Secondary research for Occupational Analysis



Step 4: Validation of Occupational Maps and Career Paths

The prepared Occupational Maps were presented to industry experts and representatives from health provider organisations for validation through interviews, workshops and through discussions over emails.

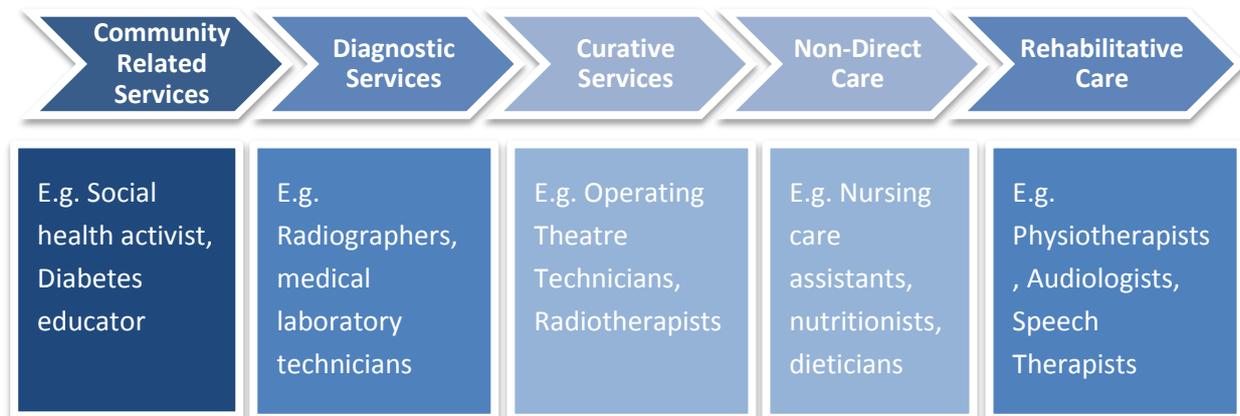
Validation inputs were received in-person and over email which were subsequently incorporated into the Occupational mapping report.

Profile of the Allied Health Sector

Industry Scope and Size

Allied Health workers play an important role across the value chain of delivery of healthcare services; allied health personnel include a wide array of job roles and provide services both in the private and public health systems, in urban and rural areas; in primary, secondary and tertiary care institutions and in standalone health centres. In some cases, they are even front-line health workers in the rural areas (e.g. Accredited Social Health Activists, Male multipurpose workers etc. as part of the National Rural Health Mission).

Figure 7: Involvement of Allied Health Professionals across the Health Value Chain



At present, there is a vast variety of allied health service professions; major categories are physiotherapists, occupational therapists, medical laboratory technicians, radiology technicians (diagnostic imaging technicians, radiotherapy and radioisotope technicians), speech therapists and audiologists, clinical technicians, operating theatre technicians. While these relatively more established categories of personnel are increasing across the country, newer categories of allied health personnel are also coming on stream (World Health Organisation, 2000).

Allied Health Professionals (AHPs) play an important role in providing health care or supportive services pertaining to diagnostic, treatment, counselling, dietary, rehabilitation and health management system, among others. These professionals, while vitally important to the delivery of healthcare, are predominantly unrecognised players in the Health industry in India. Primarily, these professionals are referred to as paramedical staff in the country and both allied health services and education of allied health professionals have been relatively neglected fields.

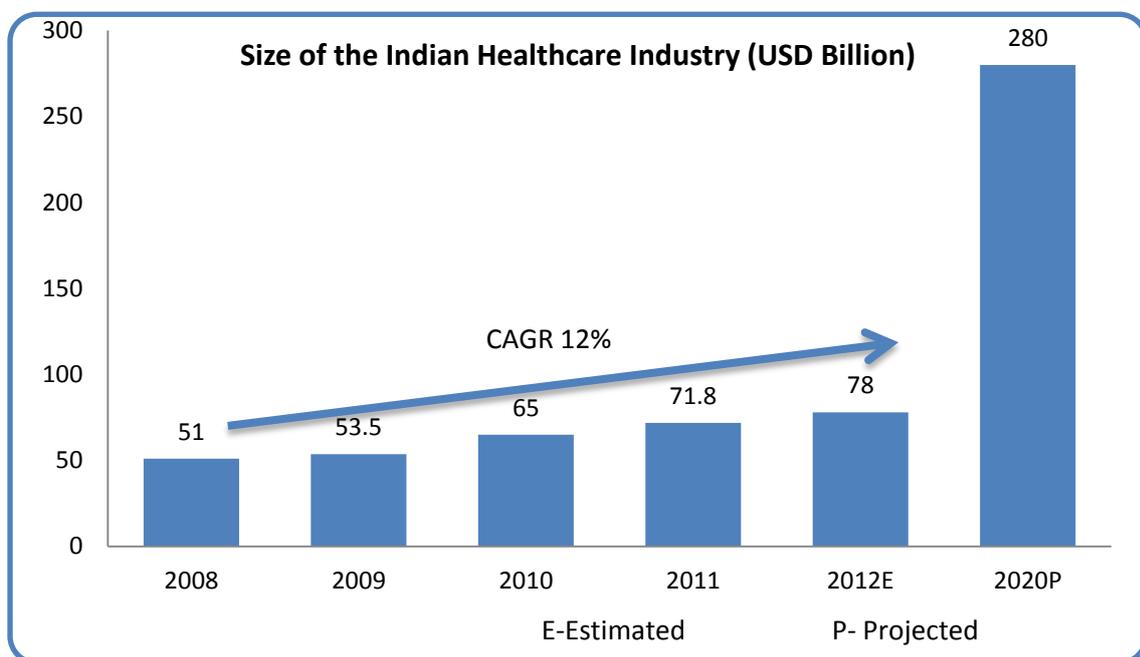
A key facet of this industry is the lack of a single definition of Allied Health Professionals across the Healthcare industry in India; for the purposes of this report, Allied Health represents a group of health care professionals who are directly or indirectly involved in assisting trained Medical professionals in the delivery of health or related services. They are “health-related personnel who fulfil necessary roles in the healthcare system, including assisting, facilitating, and complementing the work of physicians and other healthcare specialists” (as defined by the American Medical Association) (Douglas & Drew, 2004).

It can therefore be seen that while Allied Health professionals are a vital part of the Health Industry, neither the value added by these professionals (or the size of the industry in terms of revenue) nor the market size (in terms of expenditure on services) can be separated from that of the overall Healthcare market.

The overall market and revenue for Allied Health is homologous with that for the healthcare industry and the growth of and the demand for Allied Health professionals will increase in conjunction with the latter.

In 2012, the estimated size of the Health Industry in India was USD 78 Billion with a cumulative annual growth rate of 12% from 2008 to 2012. The industry is expected to grow to USD 280 billion by 2020 (Indian Brand Equity Foundation, 2012).

Figure 8: Size of the Indian Healthcare Industry



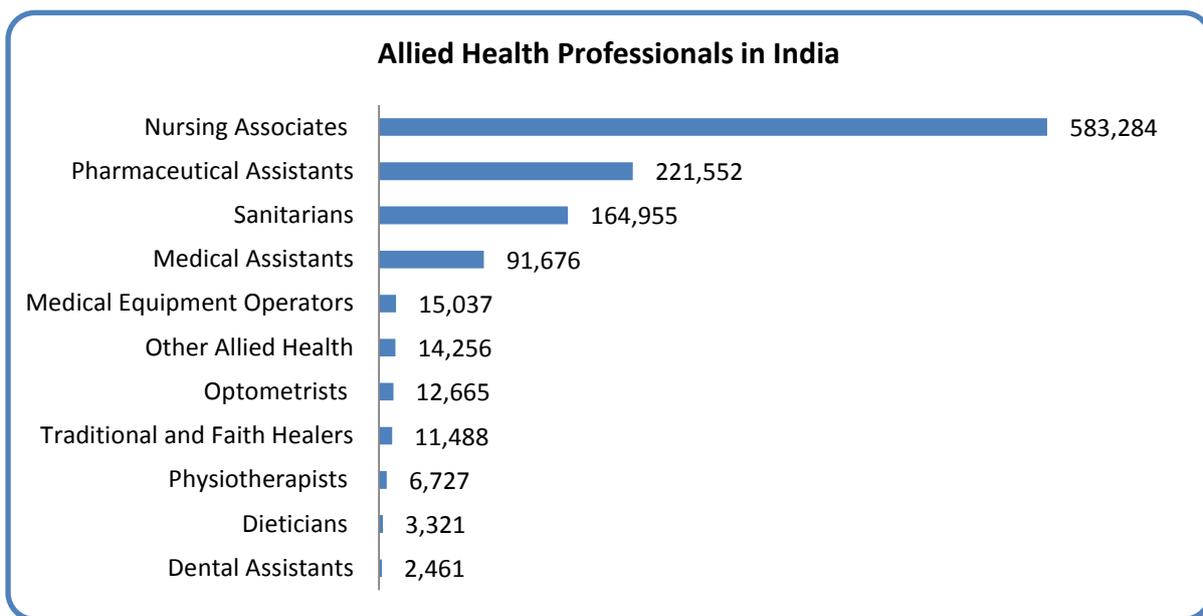
Source: (Indian Brand Equity Foundation, 2012)

The exact proportion of this industry attributable to Allied Health is not available and is difficult to estimate, given the complex and interrelated delivery process for health services. Again, given that the Allied Health Professionals do not have a single registration or regulatory council like Doctors or Nursing Staff, the exact size of the workforce in Allied Health is not easily measurable.

However, the Census of India covers major categories of Allied Health Professionals in the survey and data on the workforce in these categories is available (see Figure 9: Allied Health Professionals in India). There are over 11 lakh allied health professionals in the country in the categories of:

- Nursing Associates
- Pharmaceutical Assistants
- Sanitarians
- Medical Assistants
- Medical Equipment Operators
- Optometrists
- Traditional and Faith Healers
- Physiotherapists
- Dieticians
- Dental Assistants

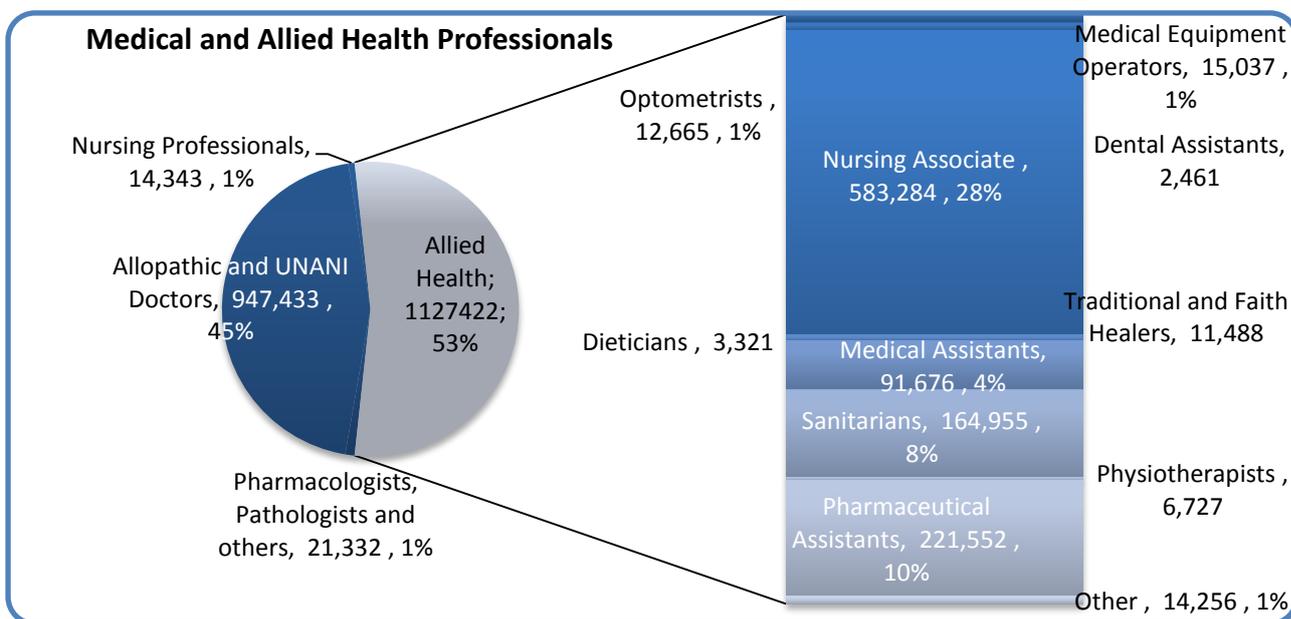
Figure 9: Allied Health Professionals in India



(Census of India, 2001)

An analysis of existing data shows that Allied Health professionals comprise 53% of the Health and allied services workforce in the country.

Figure 10: Medical and Allied Health Professionals in India



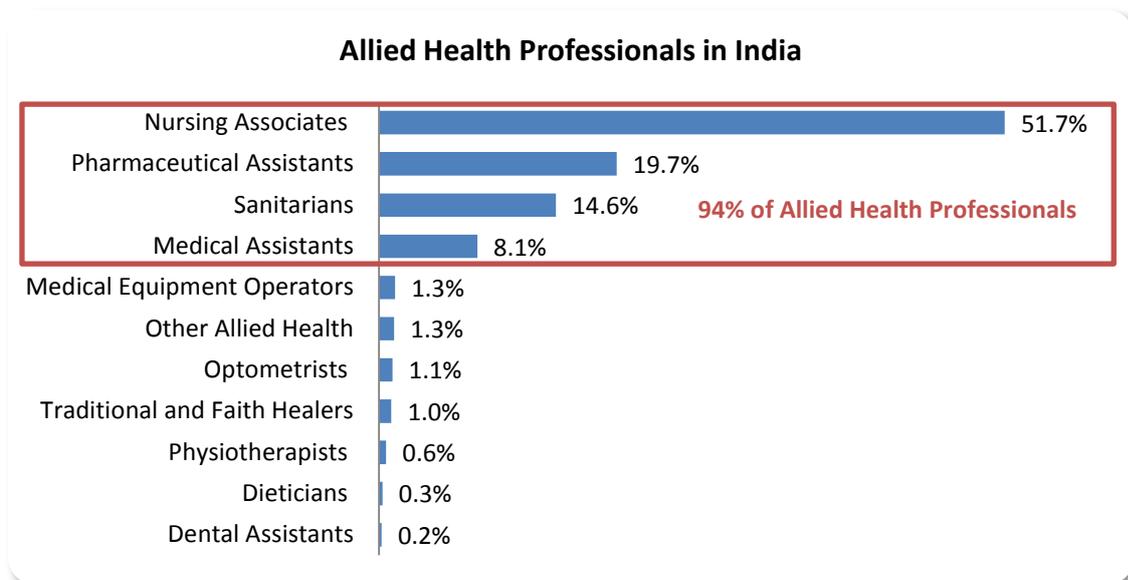
Source: (Census of India, 2001)

Within the Allied Health workforce, over 90% of the workforce is covered by just four job roles:

- Nursing Associates
- Pharmaceutical Assistants
- Sanitarians
- Medical Assistants

The largest categories are those of Nursing associates (comprising over 50% of the total workforce and Pharmaceutical assistants (almost 20% of the workforce) (see Figure 11 for details).

Figure 11: Primary Categories of Allied Health Workforce



(Census of India, 2001)

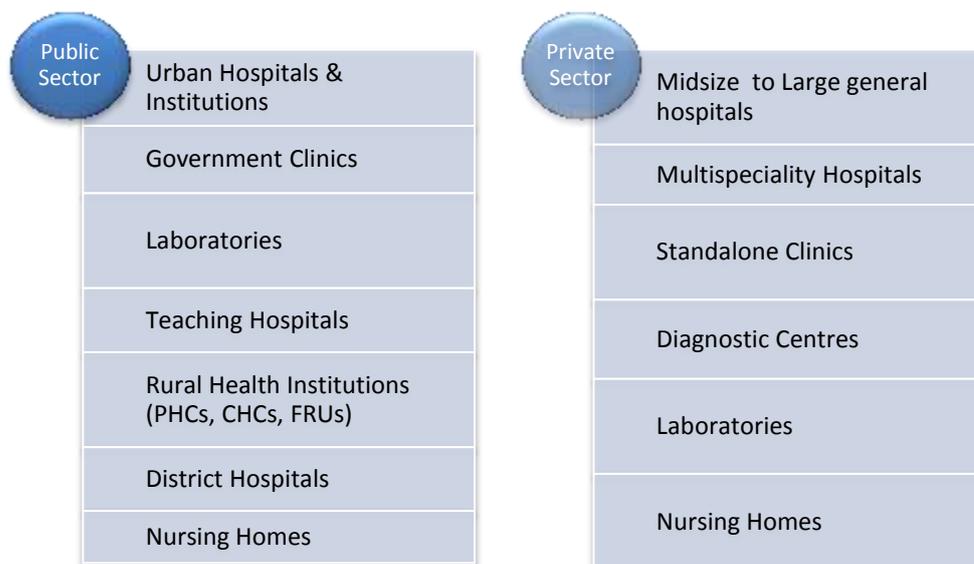
Another striking feature of the Allied Health sector is the concentration of workers within a few categories; 94% of the workforce is found in just 4 job roles: Nursing associates (over 51%), Pharmaceutical assistants, sanitarians (or health inspectors) and medical assistants.

Business and Workforce Characteristics

Business Landscape

The health sector can be divided into two major categories of organisations: Public sector health providers and Private sector health providers. The primary types of health provider organisations in these sectors are summarised in Figure 12: Mapping the Organisations in the Industry.

Figure 12: Mapping the Organisations in the Industry



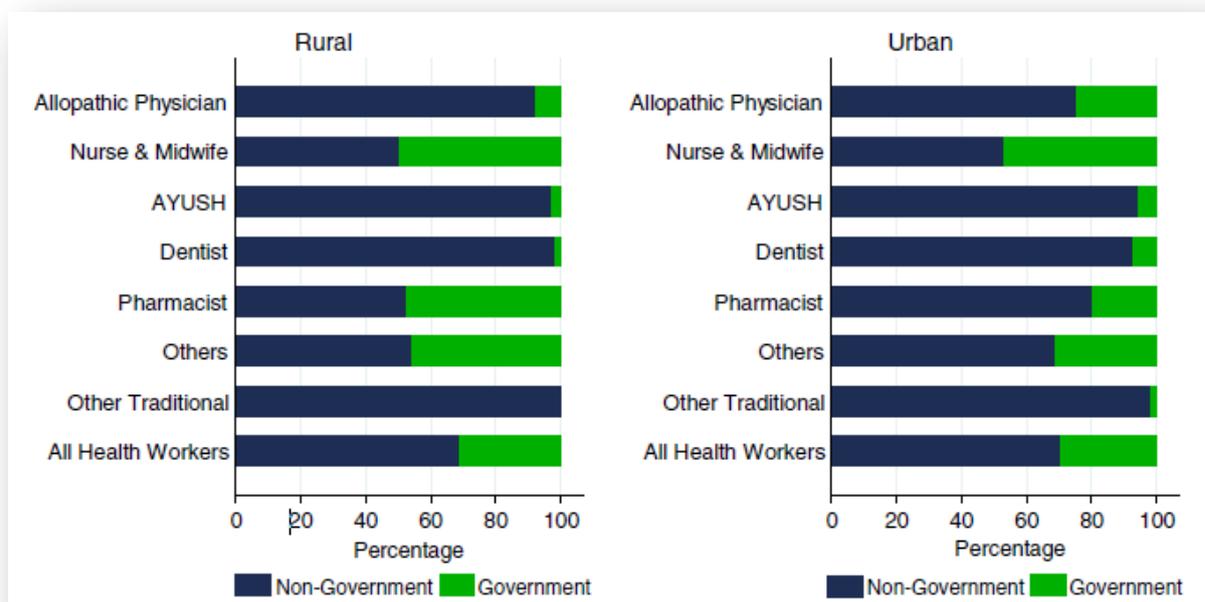
In India, the majority of healthcare provider organisations lie in the private sector; the private sector accounts for more than 65 per cent of primary care centres and more than 40 per cent of hospitals in the country (Indian Brand Equity Foundation, 2012).

In terms of contribution to sector revenues, of the total healthcare spending in the country in 2011, the private sector contributed 68 per cent with the public sector making up the remaining 32%.

In a similar vein, the private sector accounts for a majority of the workforce employed (over 60% of total health workers) in the health sector as well; this applies to Allied Health professionals as well.

In the Allied Health space, over 50% of workers in rural areas and over 60% in urban areas work in the private sector.

Figure 13: Distribution of health workforce by sector, 2005



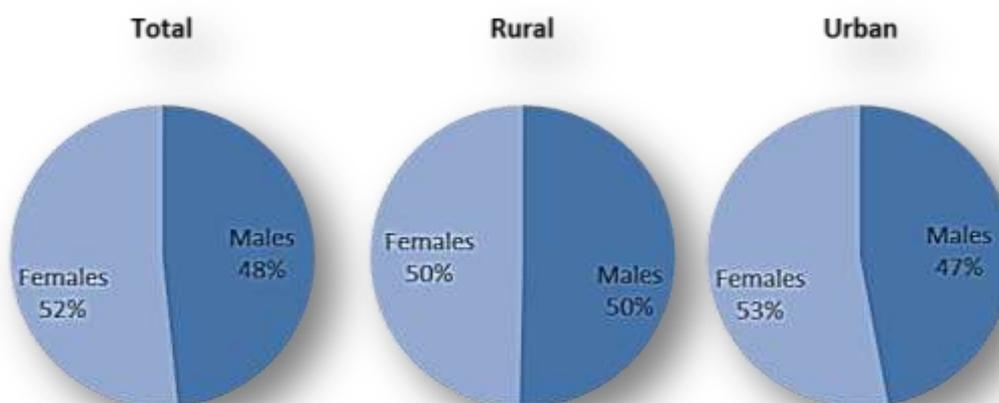
Source: (Rao, et al., 2012, p. 6)

*Note: **AYUSH**: Ayurvedic, Yoga, Unani, Siddha, and Homoeopathy; **Others**: Dietician & Nutritionist, Opticians, Dental Assistant, Physiotherapist, Medical Assistant & Technician, Other hospital staff; **Other Traditional**: Traditional medicine practitioner, Faith healer*

Workforce Characteristics

The Allied Health workforce in the country is, on a broad level, evenly divided across gender; roughly half of the workforce is female, irrespective of urban and rural areas.

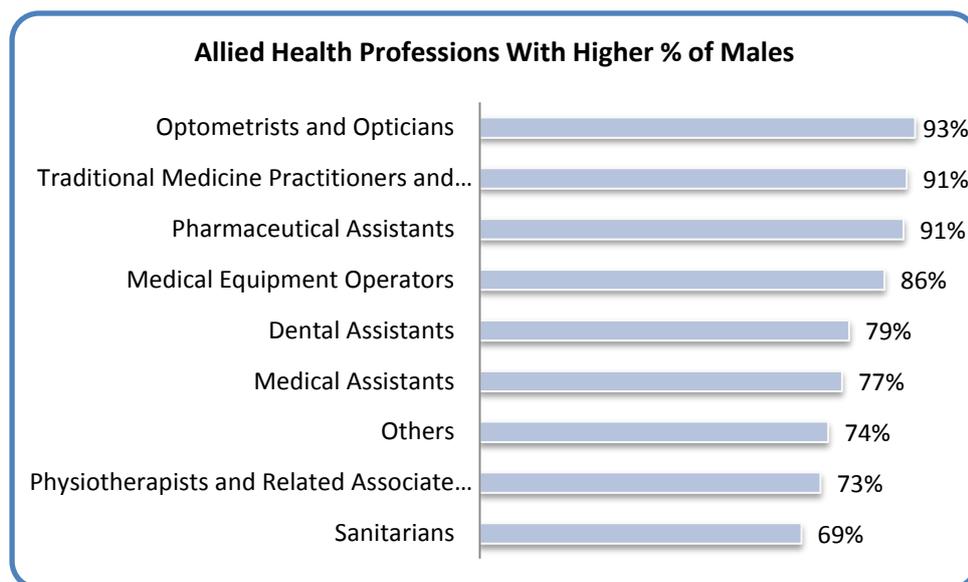
Figure 14: Gender Distribution of Allied Health Workforce



Source: (Census of India, 2001)

However, a closer look at the gender division within occupations shows that barring two occupations; nursing assistants and dieticians; most allied health occupations have a significantly higher number of males than females.

Figure 15: Allied Health Professions with Higher % of Males



Source: (Census of India, 2001)

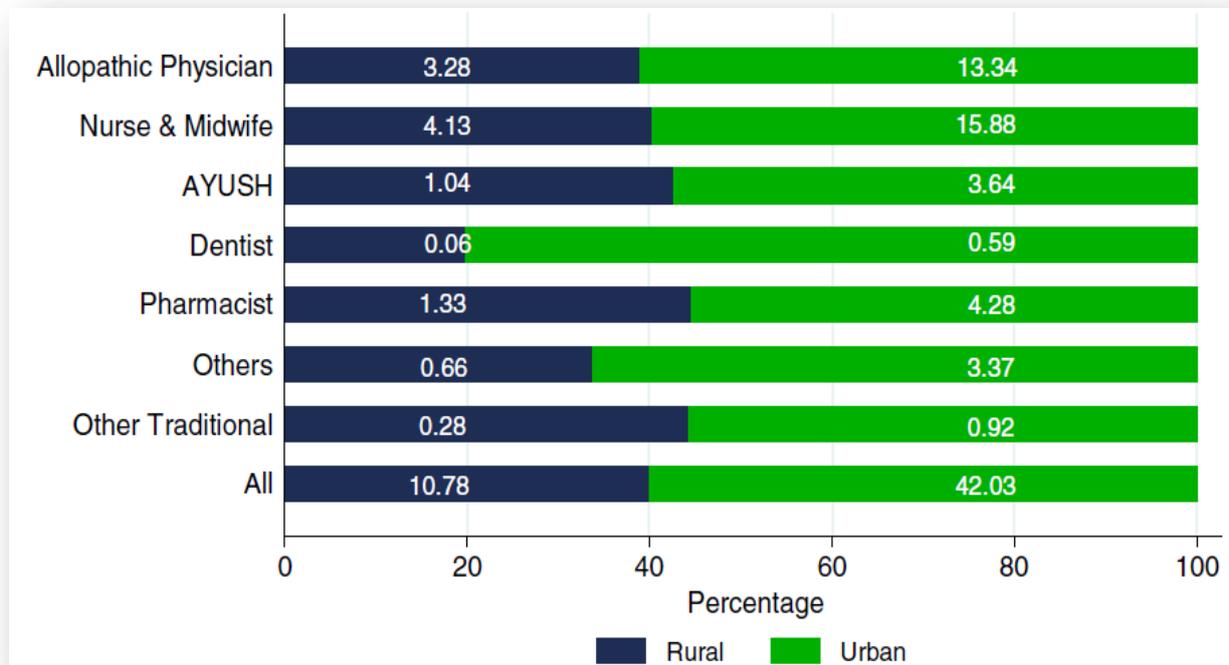
The difference arises due to the predominance of the nursing assistant category; this accounts for over 50% of total Allied Health Workers and over 80% of this workforce is female, effectively balancing the workforce at the national level.

Spatial Distribution of the Sector

There is a significant geographical divide between the availability of the Health and Allied Health workforce across urban and rural areas in the country. The number of Allied health workers per

10,000 population in urban areas is more than 5 times that in rural areas, with less than 40% of the Allied Health workforce based in rural areas.

Figure 16: Density of Health Workers in Urban and Rural Areas (Per 10,000 Population)



Source: (Rao, et al., 2012)

*Note: **AYUSH**: Ayurvedic, Yoga, Unani, Siddha, and Homoeopathy; **Others**: Dietician & Nutritionist, Opticians, Dental Assistant, Physiotherapist, Medical Assistant & Technician, Other hospital staff; **Other Traditional**: Traditional medicine practitioner, Faith healer*

It can be stated that in the large urban conglomerates there is relative over-provision of allied health services compared to rural areas (World Health Organisation, 2000).

A major problem is an overall human resource shortage, which leaves gaps within the existing infrastructure and services, both within and outside the sector. The types of human resource crunch faced across the country vary due to factors like acute shortages, imbalances arising out of geographical distribution and low productivity amongst hired staff.

Acute shortage is commonly aggravated by a skewed distribution within the country and movement of health workers from rural to urban areas, from public to private (for-profit and not-for-profit), or to jobs outside the health sector. Contributing factors include insufficient investment in pre-service training, migration, work overload, inadequate growth opportunities and work environment issues (infrastructure, technical and safety, amongst others).

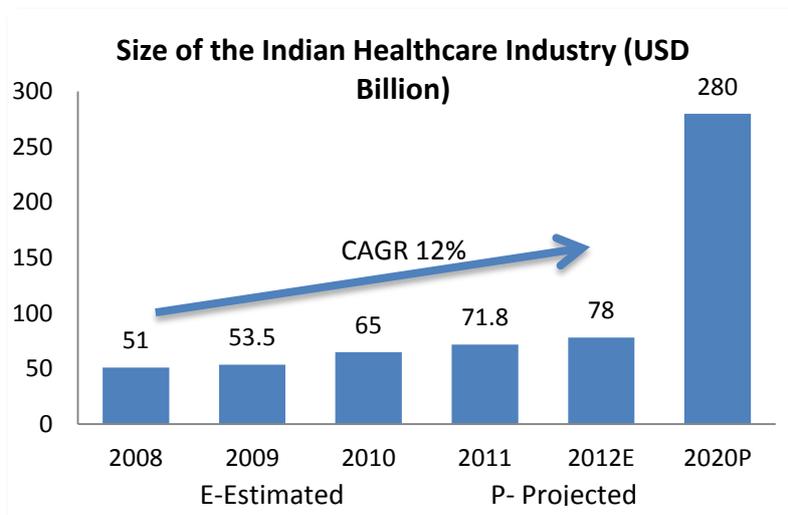
Key Drivers for the Allied Health Sector

A wide range of issues now influence the industry and impact directly on businesses. Some are due to market forces, and many occur due to the regulatory framework within which the industry works.

Health Sector Demand

Rising incomes has meant a steady growth in ability to access healthcare and related services, which in conjunction with other factors has led to a steady increase in the demand for healthcare in India. The size of the healthcare industry has grown rapidly in the period from 2008-12, with a cumulative aggregate growth rate of 12% per annum.

Figure 17: Increase in Demand for Health services



Source: (Indian Brand Equity Foundation, 2012)

Changing demographics have also been contributing to greater healthcare spending; this is likely to continue with the size of the aged population set to rise from the current 96 million to about 168 million by 2026 (Indian Brand Equity Foundation, 2012).

An increase in incidence of lifestyle related diseases such as heart disease, obesity and diabetes have also contributed to rising healthcare spending by individuals (Indian Brand Equity Foundation, 2012).

These trends lead to increased pressure on existing health and allied health professionals and an increasing demand for workers in all health and allied health categories.

Need to strengthen rural/ public sector health institutions

As seen from the figures presented earlier, there is a relative scarcity of workers in the rural areas and in public sector health institutions as compared to the urban areas and private health institutions. Thus, there is a need to strengthen the former institutions through an increase in health and allied health workforce.

In addition, the Planning Commission has allotted USD83 billion under the 12th Five Year Plan for healthcare spending; this is about USD60 billion more compared to the 11th Plan. As a result the

share of healthcare in total plan allocation is set to rise to 2.5 per cent of GDP in the 12th Plan from 0.9 per cent in the 11th Plan (Indian Brand Equity Foundation, 2012).

The National Rural Health Mission (NRHM) too has planned the introduction of district wise pilots and setting up of more medical institutions towards strengthening rural health infrastructure (Indian Brand Equity Foundation, 2012). These trends will lead to increased demand for health and allied health professionals from the Public Sector as well.

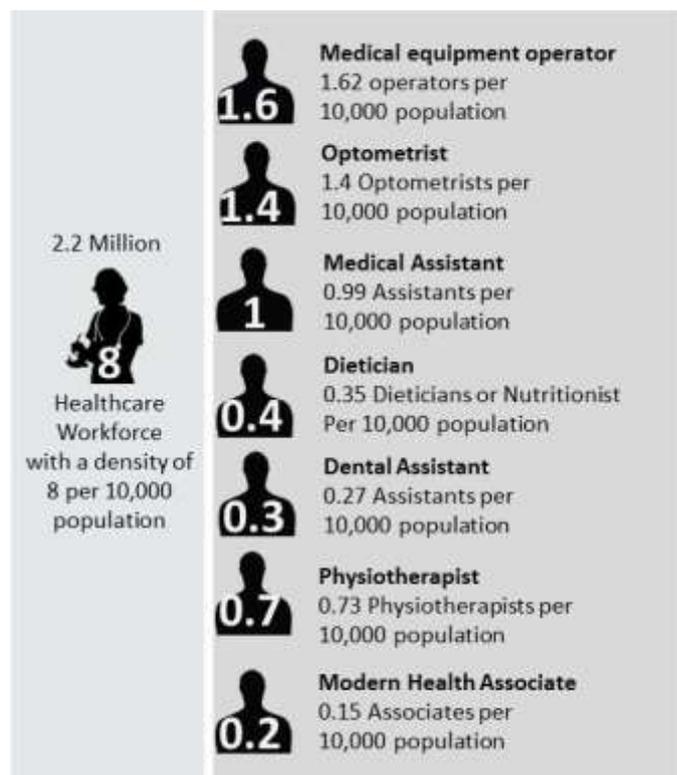
Global competition for health and allied health professionals

In the current global scenario, there is a dearth of Health and Allied Health professionals across the world, which has led to a global competition for talent in this field. This implies that Allied Health professionals in India not only have a choice of working in urban or rural areas, or for the public or private sector, they are also being wooed by global healthcare providers.

This will only add to the existing skills shortages in the country.

Impact of Sector Drivers on Current and Future Skills Requirements

Figure 18: Number of Allied Health Workers per 10,000 Population in 2001



Allied health services education has been a relatively neglected field in the country although allied health personnel play an important role in the provision of health care delivery.

Education and training of allied health personnel takes place both in the public and the private sectors. For education and training of allied health personnel, there are a number of courses ranging from short-term (up to 3 months), certificate, diploma, and graduate level. The more established categories of allied health personnel have well organised, structured programmes with updated curricula. A number of other categories currently have only a syllabus.

At present, there are 8 Allied health workers per 10,000 population in India³, which is well below the standards for

health set in 1946 for the country⁴.

³ Source: (Public Health Foundation of India, 2012)

⁴ Recommendations by Bhore committee and Chadda Committee

To make universal health coverage a reality in India, a large number of qualified allied health resources - technicians, technologists and therapists, are required in large numbers. India requires total of **65,48,754 Allied Health Professionals** to serve patients and deliver universal healthcare while there are only 2,83,378 AHPs are produced annually by education institutes and are available to the market to hire (See Figure 19: Existing Skill Gaps in Allied Health for details).

Figure 19: Existing Skill Gaps in Allied Health⁵

Discipline	Demand	Supply	Gap
Ophthalmology	1,45,236	17,678	1,27,558
Rehabilitation	18,62,584	40,265	18,22,319
Surgical & Intervention	2,05,088	7,215	1,97,873
Medical Laboratory	76,884	15,214	61,670
Radiography & Imaging	23,649	4,352	19,297
Audiology & Speech Language	10,599	3,263	7,336
Medical Technology	2,39,657	3,587	2,36,070
Dental Assistance Technology	20,48,391	6,243	20,42,148
Surgery & Anaesthesia	8,62,193	4,050	8,58,143
Misc	10,74,473	1,81,511	8,92,962
Total	65,48,754	2,83,378	62,65,376

Source: (Public Health Foundation of India, 2012)

In light of the increasing demand for health services, these skill shortages and talent gaps are only likely to increase with time.

This context makes it imperative to standardise the qualifications and roles for the Allied Health sector to the extent possible. The National Occupational Standards for the Allied Health sector are therefore the need of the day.

⁵ Demand is calculated using basic international norms (Public Health Foundation of India, 2012)

Occupational Mapping of the Allied Health Sector

The Allied Health industry can be classified into five sub-sectors based on the range of tasks performed by Allied Health professionals. These can be defined as follows:

1. **Diagnostic Services:** Involves a full range of engagement types that include Cardiovascular, Medical and clinical laboratory, and Radiological technologist and technician services.
2. **Curative Services:** Involves treatments, counselling, patient education, and administration of medication. It comprises engagements like Nursing assistant, ICU technician, Medical assistant and Mental health counsellor etc.
3. **Non-Direct Care:** These services are not directly involved in providing care to persons needing health services, but rather support the care of individuals by making available products and services required for care. It includes engagements like Medical physicist, Pharmacy technician, Medical secretary and Epidemiologist etc.
4. **Rehabilitative Care:** Rehabilitative services provide treatment to facilitate the process of recovery from injury, illness, or disease to as normal a condition as possible. These include services of Prosthetic and orthotic technician, occupational therapist, speech-language therapist, audiometry technician and physiotherapists etc.
5. **Community Related Services:** Community related service provides are concerned with improvement of the health of communities. These include community-based rehabilitation therapies, home-based care workers and ASHA worker.

Unique job roles identified under each of these sub-sectors are summarised in Figure 21: Occupational Map for Allied Health. In summary, this report identifies 38 unique job roles at the entry level in the Allied Health Industry distributed as follows:

Figure 20: Distribution of Job Roles in Allied Health

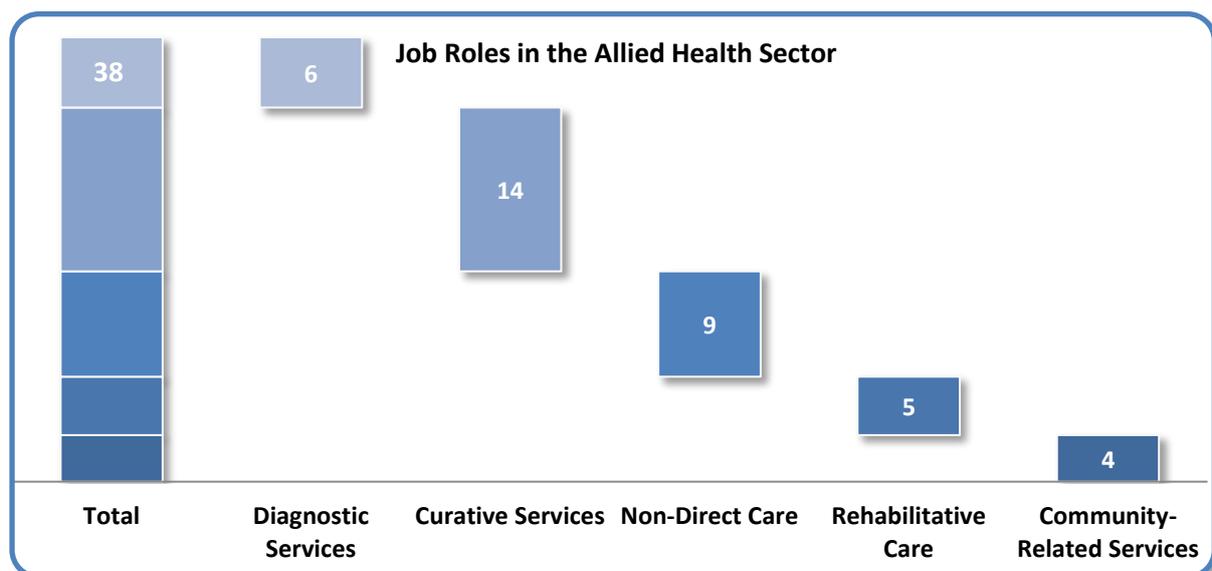


Figure 21: Occupational Map for Allied Health

ALLIED HEALTH SUB-SECTORS					
	Diagnostic Services	Curative Services	Non-Direct Care	Rehabilitative Care	Community-Related Services
JOB ROLES	<ul style="list-style-type: none"> Cardiovascular technologist and technician Cytotechnologist Histotechnician Medical and clinical laboratory technician Phlebotomist Radiological technician and technologist 	<ul style="list-style-type: none"> Anaesthesiologist assistant Blood bank technician Chiropractor Dental assistant Dental hygienist Dialysis technician Electro-neuro diagnostic technologist Emergency and medical technician Medical assistant Mental health counsellor Nuclear medicine technologist Optician Optometrist Surgical technologist/OT technician 	<ul style="list-style-type: none"> Dental laboratory technician Dietician and nutritionist Home health aide Medical equipment technician Medical records and health information technician Medical transcriptionist Nursing assistant Pharmacy technician Physician’s assistant 	<ul style="list-style-type: none"> Audiologist Occupational therapist Orthotist and Prosthetist Physiotherapist Speech–language pathologist 	<ul style="list-style-type: none"> ASHA Diabetes educator Health educator Sanitary Inspector

The subsequent sections of the report describe Occupational Analysis conducted separately for each of these sub-sectors. These sections provide a snapshot of each entry-level job role within the sub-sector, with the following details:

- **Nature of work** involved in the job role
- **Qualifications, knowledge and skills** of the individuals in the entry level job roles: The typical educational qualifications (and job experience) held by individuals entering the job role as well as opportunities for further learning, higher education and on-the-job training where relevant
- **Employment opportunities and career pathways** for individuals in the job roles: This includes:
 - Summary of the type of organisations where the job role exists
 - Typical entry level positions
 - Opportunities for career growth both within the sub-sector and in other sub-sectors (where relevant). This describes the links between the sub-sectors with respect to movement of workforce
- **Job description:** A summary of roles and responsibilities held by individuals entering the job roles

Job Roles in the Diagnostic Services Sub-Sector

1. Cardiovascular Technologist and Technician

Nature of Work

Cardiovascular technologists undergo specific didactic, laboratory, and clinical technological education to perform various cardiovascular/peripheral vascular diagnostic and therapeutic procedures. Certified cardiovascular technologists perform diagnostic examinations and therapeutic interventions of the heart and/or blood vessels at the direction of a physician. They may specialize in three areas of practice: invasive cardiology, echocardiography, and vascular technology.

Cardiovascular technicians who specialize in electrocardiograms (EKGs), stress testing, and Holter monitoring are known as cardio graphic or EKG technicians. Hence, they may conduct or assist in conducting electrocardiograms, performing cardiac catheterizations, assessing pulmonary functions, lung capacity, and similar tests.

In the Indian context, these technologists and technicians are called Cardiac Care Technicians.

Qualifications, Skills and Knowledge

In India, typical qualifications at the entry level include:

- Diploma in Cardiac Care Technology
- Diploma in Cardiovascular & Thoracic Surgery Technician
- Bachelor in Cardiac Care Technology
- Bachelor in Cardiovascular Technology

Professionals are trained on the job by a supervisor or a cardiologist. On-the-job training usually lasts for about 8– 16 weeks. Emphasis is given to areas such as invasive cardiology, non-invasive/echo cardiology, non-invasive peripheral vascular, and cardiac electrophysiology studies. Both didactic instruction and clinical experience are provided in these areas.

For career progression and lateral hiring, courses in M.Sc. in Cardiac Technology are also available.

Employment Opportunities and Career Pathways

Cardiovascular technologists may provide their services to patients in any medical setting under the supervision of a Doctor of Medicine (MD) or Doctor of Osteopathy (DO). Cardiovascular technologists may be employed by:

- Hospitals
- Multi-speciality clinics
- Diagnostic centres
- Private nursing homes
- Invasive cardiovascular laboratories
- Non-invasive cardiovascular laboratories

- Non-invasive peripheral vascular studies laboratories

The entry point for a cardiovascular technician is at the position of a Junior Cardiac Care Technician; the typical career progression for the job role is described below.

Table 1: Career path - Cardiovascular Technician

Sector	Allied Health and Paramedics
Sub-sector	Diagnostic
Occupation	Cardiac Care Technician
Leadership level	Cath Lab Manager
Middle Management level	Team leader /Chief Cardiac Care Technician
	Supervisor
	Senior Cardiac Care Technician
Entry Level	Junior Cardiac Care Technician

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Cardiovascular technologists and technicians must be accurate and thorough. The role of the cardiovascular technologist may include, but is not limited to, the following:

- Reviewing and/or recording pertinent patient history, and supporting clinical data
- Performing appropriate clinical procedures and obtaining a record of anatomical, pathological, and/or physiological data for interpretation by a physician
- Exercising discretion and judgement in the performance of cardiovascular diagnostic and therapeutic services
- Participating in interventional cardiovascular catheterization and/or cardiac electrophysiology procedures, including balloon angioplasty, stent insertion, radiofrequency ablation, and pacemaker and/or implantable defibrillator insertion
- Participating in cardiac catheterization, blood gas analysis, and electrophysiology testing and interventional procedures
- Conducting echocardiography, exercise stress test, and electrocardiography testing
- Conducting duplex ultrasound studies of the peripheral vascular system, segmental blood pressure measurements of the extremities, and plethysmography testing

2. Cytotechnologist

Nature of Work

Cytology is the study of the formation, structure and function of cells. A cytotechnologist (CT) is a laboratory specialist who is a trained technologist working with pathologists, and responsible for examining human cell samples under the microscope for early signs of cancer and other diseases.

The cytotechnologist performs the primary and secondary evaluation, and analyses subtle cell changes, both nuclear and cytoplasmic, and compares these changes to normal cell findings for that body site.

Qualifications, Skills and Knowledge

A Bachelor's degree (in any science related discipline) with three years of college education plus one calendar year of special instruction in cytotechnology is required for entry level competency. The curriculum emphasizes:

- Embryology
- Cytology as applied in clinical medicine
- Clinical medicine
- Human anatomy
- Cytophysiology
- Endocrinology
- Cytochemistry
- Parasitology
- Microbiology
- Histology
- Inflammatory diseases

Various undergraduate and postgraduate diploma programmes are also available for further specialization. In India, these trainings are provided by CMC, Vellore, the Tata Memorial Hospital and regional cancer centres.

Employment Opportunities and Career Pathways

Cytotechnologists have a wide choice of practice settings:

- Hospitals
- Diagnostic and research laboratories
- Clinics
- Public health facilities
- Pharmaceutical industry

In India, the Indian Academy of Cytologists functions as the national professional body for all those in the profession. The body has its own governing structure backed by its own rules and regulations. The minimum qualification required to be a member of this body is a Master's degree in cytology.

The entry point for a cytotechnologist is at the position of a Junior technologist; the typical career progression for the job role is described below.

Table 2: Career path - Cytotechnologist

Sector	Allied Health and Paramedics			
Sub-sector	Diagnostic Services	Hospital Administration	Academics	Medical Device Industry
Occupation	Cytotechnologist			
Leadership level	Team Leader/ Lab Manager	CEO	Principal	CEO
Middle Management level	Section in-charge/ Section Head	Head of Department	Vice Principal	Head of Sales
	Senior Lab Technician		Senior Lecturers	Sales Manager/ Application Manager
Entry Level	Lab technician	Floor Manager/ Operations Manager	Lecturers	Sales executive/ Application Specialist
	Junior lab technician		Tutors	

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Cytotechnologists work with a wide variety of laboratory specimen preparations, and have a basic knowledge of contemporary procedures and technologies such as image analysis, flow cytometry, immunohistochemistry, electron microscopy, molecular diagnostic procedures, and automation. The cytotechnologist's role extends beyond the detection of malignancy and includes such issues as quality improvement, laboratory management, teaching, research, and consumer/patient education. They must possess a basic knowledge of contemporary procedures and technologies as well as qualitative and quantitative performance skills.

3. Histotechnician

Nature of Work

Histotechnology is a structural science concerned with the demonstration of cellular morphology, chemical composition, and function of normal and abnormal tissue. Histological technicians and histotechnologists are members of a laboratory team who employ histological technology to diagnose diseases, conduct research, or instruct others in the science.

Histotechnologists play a fundamental role in the Allied Health profession. Physicians (usually pathologists) and other scientists specializing in the biological sciences or related clinical areas such as chemistry, work in partnership with medical laboratory workers to analyse blood, tissues, and fluids from humans (and sometimes animals), using a variety of precision instruments. The results of these tests are used to detect and diagnose disease and other abnormalities.

Qualifications, Skills and Knowledge

In India, training for histotechnicians is given at a diploma or a certificate level by a few colleges including the Christian Medical College, Vellore and Regional Cancer Centre, Thiruvananthapuram. The length of training may vary from nine months to a year.

The training programme for histotechnologists consists of a four-year course conducted by medical colleges. Alternatively, to be a histotechnologist an individual must satisfy the requirements of at least a Bachelor's degree from a regionally accredited college/university and one-year full-time acceptable experience in a histopathology laboratory under the supervision of a pathologist.

Opportunities for higher education and career growth are offered through a Post Graduate Diploma in Histo-Technology.

Employment Opportunities and Career Pathways

Histotechnicians have a wide choice of practice settings. Hospitals, for-profit laboratories, clinics, public health facilities, and industry currently have positions open for qualified histotechnicians. Other opportunities are in industrial research, veterinary pathology, marine biology and forensic pathology.

Although hospitals are expected to continue to be the major employers of clinical laboratory workers, employment is expected to grow faster in medical and diagnostic laboratories, offices of physicians, and other ambulatory healthcare services.

The entry point for a histotechnician is at the position of a Junior Technician; the typical career progression for the job role is described below.

Table 3: Career path - Histotechnician

Sector	Allied Health and Paramedics			
Sub-sector	Diagnostic Services	Academics	Hospital Administration	Medical Device Industry
Occupation	Histotechnician			
Leadership level	Chief Histopathologist	Head of department – Laboratory	CEO	CEO
Middle Management level	Senior technologist	Professor	Head of Department	Head of Sales
		Associate Professor		Sales Manager/ Application Manager
	Junior technologist	Assistant Professor		
Entry Level	Junior technician	Lecturer	Floor Manager/ Operations Manager	Sales executive/ Application Specialist

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Histotechnicians process sections of body tissue by fixation, dehydration, embedding, sectioning, decalcification, microincineration, mounting, and routine and special staining. They identify tissue structures, cell components, and their staining characteristics, and relate them to physiological functions; and institute proper procedures to maintain accuracy and precision. Histotechnologists, in addition, perform the more complex procedures for processing tissues. They identify tissue structures, cell components, and their staining characteristics and relate them to physiological functions; implement and test new techniques and procedures; make judgements concerning the results of quality control measures; and institute proper procedures to maintain accuracy and precision. The main responsibility of the histotechnologist in the clinical laboratory is preparing sections of body tissue for examination by a pathologist. This includes the preparation of tissue specimens of human and animal origin for diagnostic, research, or teaching purposes. Tissue

Sections prepared by the histotechnologist for a variety of disease entities enable the pathologist to diagnose bodily dysfunction and malignancy.

The tasks performed by the histotechnologist require patience, mechanical ability, and knowledge of biology, immunology, molecular biology, anatomy and chemistry. They require five basic steps, each

an integral part of the histotechnologist's job: grossing and fixation, processing, embedding, sectioning and staining.

4. Medical and Clinical Laboratory Technician

Nature of Work

Medical or clinical support technicians form the backbone of the diagnostic services and research. They are responsible for supporting and assisting doctors and scientists in their day-to-day healthcare work in a variety of roles, including diagnosis and treatment of disease. They function as the main support to biomedical scientists in pathology laboratories. Medical laboratory technologists perform complex tests for diagnosis, treatment, and prevention of disease. They are also sometimes responsible for imparting training and supervision to the staff. Their work can involve a variety of laboratory skills, as given below:

- Making up chemical solutions
- Using computers to analyse data
- Responsibility for labelling and sorting of tissue samples
- Disposal of chemical or biological waste
- Maintaining stocks of consumable items
- Phlebotomy (taking blood from patients)

Clinical support technicians often have the opportunity to work in a range of different aspects of laboratory diagnosis and testing procedures, and hence can expand their responsibilities and skills by training and supervising other staff. The areas in which they can work include biochemistry, histology, immunology, haematology and transfusion science.

Qualifications, Skills and Knowledge

Typical entry level qualifications for a Medical Laboratory Technician include:

- Apprenticeship in Medical Laboratory Technology
- Certificate - Medical Laboratory Technology
- Diploma in Medical Laboratory Technology
- B.Sc. in Medical Technology
- Bachelor of Medical Laboratory Technology

Opportunities for higher education and career growth are provided through courses in:

- PG Diploma in Medical Laboratory Technology
- M.Sc. Medical Lab Technology

In India, the All India Medical Laboratory Technologists Association (AIMLTA) functions as the apex body to ensure uniform standards all across the country. It is a professional organization registered under the Societies Registration Act, 1981. It also has chapters in the states and Union Territories, which have regulations for functioning in their jurisdictions. It functions as an apex body to bring MLT professionals in the country together and for promotion of the profession in the country.

Employment Opportunities and Career Pathways

Medical or clinical laboratory technologists and technicians have work profiles that fit best in a hospital setting or independent diagnostics laboratories, though there are growing opportunities in the educational services and other ambulatory healthcare services.

The entry point for a Medical laboratory technician is at the position of a Junior Medical laboratory technician; Technicians can become technologists through additional education and experience. The potential career progression for the job role is described below. Opportunities for lateral shifts to other sectors are also described.

Table 4: Career path - Medical Laboratory Technician

Sector	Allied Health and Paramedics			
Sub-sector	Diagnostic Services	Academics	Hospital Administration	Medical Device Industry
Occupation	Medical Laboratory Technician			
Leadership level	Medical Lab Pathologist/ Biochemist/ Microbiologist	Head of department – Laboratory	Head – Laboratory Division	CEO
Middle Management level	Senior medical lab technologist/ Lab Manager/ Quality Manager	Professor – MLT	Manager	Head of Sales
		Associate/ Additional Professor – MLT	Assistant Manager	
	Junior medical lab technologist	Assistant Professor – MLT	Senior technical expert	Sales Manager/ Application Manager
Entry Level	Senior medical lab technician	Lecturer	Junior technical expert	Sales executive/ Application Specialist
	Junior medical lab technician	Instructor	Technical Associate	

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Clinical laboratory personnel examine and analyse body fluids, and cells. Technologists also prepare specimens for examination, count cells, and look for abnormal cells in the blood and body fluids. They use microscopes, cell counters, and other sophisticated laboratory equipment. After testing and examining a specimen, they analyse the results and convey them to physicians. Clinical laboratory personnel need good analytical judgement and the ability to work under pressure. Close

attention to detail is essential, because small differences or changes in test substances or numerical readouts can be crucial for patient care.

5. Phlebotomy Technician

Nature of Work

A Phlebotomy Technician (Phlebotomist) is an integral member of the medical laboratory team whose primary function is the collection of blood samples from patients by venipuncture or microtechniques. The Phlebotomy Technician facilitates the collection and transportation of laboratory specimens, and is often the patient's only contact with the medical laboratory.

Qualifications, Skills and Knowledge

Typical entry level qualifications for a Phlebotomy Technician include:

- Apprenticeship in Medical Laboratory Technology
- Certificate - Medical Laboratory Technology
- Diploma in Medical Laboratory Technology
- B.Sc. in Medical Technology
- Bachelor of Medical Laboratory Technology

Opportunities for higher education and career growth are provided through courses in:

- PG Diploma in Medical Laboratory Technology
- M.Sc. Medical Lab Technology

In India, the All India Medical Laboratory Technologists Association (AIMLTA) functions as the apex body to ensure uniform standards all across the country. It is a professional organization registered under the Societies Registration Act, 1981. It also has chapters in the states and Union Territories, which have regulations for functioning in their jurisdictions. It functions as an apex body to bring MLT professionals in the country together and for promotion of the profession in the country.

Employment Opportunities and Career Pathways

Phlebotomy technicians or Phlebotomists have work profiles that fit best in independent diagnostics laboratories, where there are growing opportunities especially in the home-based care division.

The entry point for a Phlebotomy technician is at the position of a Phlebotomist in a laboratory or collection agency for an independent laboratory; additional education and experience they can progress through to Medical Laboratory Technicians.

The potential career progression for the job role is described below. Opportunities for lateral shifts to other sectors are also described.

Table 5: Career path – Phlebotomy Technician

Sector	Allied Health and Paramedics			
Sub-sector	Diagnostic Services	Hospital Administration	Academics	Medical Device Industry

Occupation	Phlebotomy Technician			
Leadership level	Team Leader/ Lab Manager	CEO	Principal	CEO
Middle Management level	Section in-charge/ Section Head	Head of Department	Vice Principal	Head of Sales
	Senior Lab Technician		Senior Lecturers	Sales Manager/ Application Manager
Entry Level	Lab technician	Floor Manager/ Operations Manager	Lecturers	Sales executive/ Application Specialist
	Junior lab technician		Tutors	
	Phlebotomist			

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

The primary function of a Phlebotomy Technician is to obtain patient blood specimens by venipuncture or microtechniques. The Phlebotomy Technician aids in the collection and transportation of other laboratory specimens, and may be involved with patient data entry. A Phlebotomy Technician also draws blood for transfusions, donations and research.

Duties differ by doctor office, hospital and laboratory but may include:

- Drawing blood from patients or donors in hospitals, blood banks, clinics, doctor offices, laboratories or similar facility for medical purposes
- Assembling equipment (such as needles, blood collection devices, gauze, tourniquet, cotton, and alcohol)
- Verifying or recording identity of patient or donor
- Conversing with patients to allay fear of procedure
- Applying tourniquet to arm, locates vein, swabbing area with disinfectant and inserting needle into vein to draw blood into collection tube
- Labelling and storing blood container for processing
- Conducting interview and taking vital signs
- Testing blood samples to screen donors at a blood bank
- Analysing information and making appropriate recommendations

6. Radiological Technician and Technologist

Nature of Work

Radiological technologists and technicians also referred to as radiographers, perform diagnostic imaging examinations such as X-rays, CT, MRI, fluoroscopy, ultrasound, and mammography.

They are responsible for preparing patients and operating equipment for the test, besides keeping patient records, and adjusting and maintaining equipment. They prepare work schedules, evaluate purchase of equipment, or manage a radiology department.

They must conform to the guidelines provided by the physician for patient safety as well as to other regulations in order to save any unnecessary exposure of the patient, themselves, and co-workers.

Qualifications, Skills and Knowledge

Radiographers play an important role in hospitals, laboratories, and clinics in India. In order to practise, they need a Bachelor of Science degree in Radiography, which is a three-year course that deals with all the major concepts related to this field. Diploma courses are for two years with compulsory practical training. One-year certificate courses in Radiography are also available.

Employment Opportunities and Career Pathways

Some radiological technologists specialize in CT as CT technologists. They can also specialize as MRI technologists. Besides CT and MRI, radiological technologists might also specialize in mammography.

Experienced candidates may be promoted to supervisory positions in clinics, hospitals or laboratories.

The entry point for a Radiological technician is at the position of a Junior radiological technician; technicians can become technologists through additional education and experience. The potential career progression for the job role is described below. Opportunities for lateral shifts to other sectors are also described.

Table 6: Career path - Radiological Technician

Sector	Allied Health and Paramedics			
Sub-sector	Diagnostic Services	Hospital Administration	Academics	Medical Device Industry
Occupation	Radiological Technician			
Leadership level	Chief Technician	CEO	Principal	CEO
Middle Management level	Supervisor	Head of Department	Vice Principal	Head of Sales
	Assistant Supervisor		Senior	Sales Manager/

				Lecturers	Application Manager
Entry Level	Senior radiological Technician	Radiation Safety Officer	Floor Manager/ Operations Manager	Lecturers	Sales executive/ Application Specialist
	Junior radiological technician			Tutors	

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

- Use radiation safety measures and protection devices to comply with government regulations, and to ensure the safety of patients and staff
- Review and evaluate developed X-rays, video tapes, or computer-generated information to determine if the images are satisfactory for diagnostic purposes
- Position imaging equipment and adjust controls to set exposure time and distance, according to specifications for examination
- Explain procedures and observe patients to ensure safety and comfort during scanning
- Key commands and data into a computer, to document and specify scan sequences, adjust transmitters and receivers, or photograph certain images
- Operate or oversee the operation of radiological or magnetic imaging equipment to produce images of the body for diagnostic purposes
- Position and immobilize the patient on the examination table
- Record, process, and maintain patient data or treatment records, and prepare reports
- Take thorough and accurate patient medical histories
- Remove and process film



JOB ROLES IN THE CURATIVE SERVICES SUB-SECTOR

Job Roles in the Curative Services Sub-Sector

7. Anaesthesiologist Assistant

Nature of Work

The anaesthesiologist assistant (AA) is a skilled person, with advanced academic and clinical educational qualifications, and is responsible for developing and implementing the anaesthetic care plan under the direction of a qualified anaesthesiologist. AAs gather patient data to assist in evaluating the patient's physical and mental status, to record the surgical procedures planned, and to help the directing anaesthesiologist administer the plan that has been formulated for the patient.

They also assist the anaesthesiologist in the administration of anaesthesia for surgical and on surgical procedures, monitor patient status and provide patient care during surgical treatment.

Qualifications, Skills and Knowledge

Training programmes for Anaesthesia assistant such as Diploma in Anaesthesia Technology are typically of 24–28 months' duration and require an undergraduate degree in Science. Knowledge of the basic sciences such as physiology, pharmacology, anatomy and biochemistry is essential.

Specialised undergraduate degrees such as B.Sc. - Anaesthesia, OT & Critical Care Technology are also available.

Extensive clinical exposure during the programme ensures that the students are trained in patient monitoring, anaesthesia delivery systems, life-support systems and patient assessment.

Employment Opportunities and Career Pathways

AAs work as members of the anaesthesia care team in any setting where they may be appropriately directed by legally responsible anaesthesiologists.

Experience to date has been that AAs are most commonly employed in larger facilities that perform procedures such as cardiac surgery, neurosurgery, transplant surgery and trauma care, given their training in patient monitoring devices and complex patient procedures.

An AA can be utilized in nursing homes, surgical centres, outpatient facilities, mental health and well-being organizations, emergency bedrooms and private hospitals.

The potential career progression for the job role is described below. Opportunities for lateral shifts to other sectors are also described.

Table 7: Career path – Anaesthesia Assistant

Sector	Allied Health and Paramedics
Sub-sector	Diagnostic
Occupation	Anaesthesia Assistant
Leadership level	Supervisor

Middle Management level	Senior Anaesthesia Technician
Entry Level	Junior Anaesthesia Technician

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

The tasks performed by AAs reflect regional variations in anaesthesia practice and regulatory factors. The AA's functions include, but are not limited to, the following:

- Obtain an appropriate and accurate pre-anaesthetic health history, perform an appropriate physical examination, and record pertinent data in an organized and legible manner
- Conduct diagnostic laboratory and related studies as appropriate, such as drawing arterial and venous blood samples
- Establish non-invasive and invasive routine monitoring modalities, as delegated by the supervising anaesthesiologist
- Administer induction agents, maintain and alter anaesthesia levels, administer adjunctive treatment, and provide continuity of anaesthetic care into and during the postoperative recovery period.
- Apply and interpret advanced monitoring techniques, such as pulmonary artery catheterization, electroencephalographic spectral analysis, echocardiography, and evoked potentials
- Use advanced life-support techniques, such as high-frequency ventilation and intra-arterial cardiovascular assist devices
- Make post-anaesthesia patient rounds by recording patient progress notes, compiling and recording case summaries, and by transcribing standing and specific orders
- Evaluate and treat life-threatening situations, such as cardiopulmonary resuscitation, on the basis of established protocols (BLS, ACLS, and PALS)
- Perform duties in intensive care units, pain clinics, and other settings, as appropriate

8. Blood Banking Technician

Nature of Work

Blood bank technology specialists are responsible for testing donated blood before it is used for transfusion. These highly trained health workers help ensure that blood products are properly typed and labelled, and free of disease. Specialists in blood banking (SBB) perform both routine and specialized tests in blood centres, reference laboratories, and research facilities.

Qualifications, Skills and Knowledge

The usual requirement for an entry-level position as a clinical laboratory technologist is a Bachelor's degree with a major in medical technology or one of the life sciences. However, Technicians with a Diploma in Blood Bank Technology are also accepted at the post.

There is a technical certification programme and postgraduate education for further specialization in the field. It is possible to qualify for some jobs, however, with a combination of education, and on-the-job and specialized training. Universities and hospitals offer medical technology programmes.

Most new Technicians are given a 6 month certification course in Blood Banking by the hiring organisation to familiarise them with the specific requirements of a Blood Bank.

Employment Opportunities and Career Pathways

Specialists in blood bank technology work in many types of facilities, including community blood centres, private hospital blood banks, university-affiliated blood banks, transfusion services, tissue transplantation laboratories, and bank equipment suppliers. They may also be part of a university faculty. They may have some weekend and night duty, including emergency calls. Qualified specialists may advance to supervisory or administrative positions, or move into teaching or research activities. The criteria for advancement in this field are experience, technical expertise, and completion of advanced education courses.

The potential career progression for the job role is described below. Opportunities for lateral shifts to other sectors are also described.

Table 8: Career path – Blood Banking Technician

Sector	Allied Health and Paramedics
Sub-sector	Curative Services
Occupation	Blood Banking Technician
Leadership level	Blood Bank Manager
Middle Management level	Blood Bank Supervisor
	Senior Blood Banking Technician
Entry Level	Junior Blood Banking Technician

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually*

highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.

Job Description

The blood bank specialist is responsible for the following:

- Screening potential blood donors to eliminate people who have certain health issues that could endanger a recipient of the transfused blood
- Drawing, identifying the type, and separating donated blood into its components, such as platelets and plasma
- Screening for health risks such as anaemia, hepatitis, and HIV
- Performing additional tests to identify the group antigens, compatibility, and antibodies in the blood
- Properly labelling and storing blood products
- Conducting investigations when a patient has a negative reaction to a blood transfusion
- Assisting physicians during transfusion therapy with patients who have blood clotting problems or hope to receive tissue or organ transplants

9. Chiropractor

Nature of Work

Chiropractic is a healthcare discipline that places emphasis on the diagnosis and treatment of any nerve, muscle, bone, joint, or tissue disorder (disorders of the neuromusculoskeletal system). The practice of chiropractic focuses on the relationship between structure (primarily the spine) and function (as coordinated by the nervous system), and how that relationship affects the preservation and restoration of health.

Qualifications, Skills and Knowledge

In India, the chiropractor profession is headed by the Indian Association of Chiropractic Doctors (IACD). This association is the member of World Federation of Chiropractic (WFC), which is affiliated to the World Health Organization (WHO). The IACD is mainly responsible for the promotion of this particular profession in India, and this is achieved by advertising and conducting charitable health camps all over the country. A few colleges in India, such as the International Centre for Holistic Healing and Allied Research, West Bengal, provide various diplomas, degree, postgraduate, and doctoral courses.

Employment Opportunities and Career Pathways

Some chiropractors specialize in sports injuries, neurology, orthopaedics, paediatrics, nutrition, internal disorders, or diagnostic imaging. In addition to working in their own offices, chiropractors also may spend time visiting patients in nursing homes or performing surgery at hospitals or ambulatory surgical centres. Many chiropractors are solo or group practitioners who also have the administrative responsibilities of running a practice. Chiropractors in private practice are responsible for developing a patient base, hiring employees, and keeping records.

In India, this particular field is still in the nascent stage and thus not much information is available on job opportunities and career paths.

Job Description

The chiropractic approach to healthcare is holistic, stressing the patient's overall health and Well-being. It recognizes that many factors affect health, including exercise, diet, rest, environment, and heredity. Chiropractors provide natural, drugless, non-surgical health treatments, and rely on the body's inherent recuperative abilities. They also recommend lifestyle changes, for example, in eating, exercise, and sleeping habits, to their patients. When appropriate, chiropractors consult with and refer patients to other health practitioners.

Chiropractors, also known as doctors of chiropractic or chiropractic physicians, diagnose and treat patients whose health problems are associated with the body's muscular, nervous, and skeletal systems, especially the spine. They adjust spinal column and other articulations of the body to correct abnormalities of the human body believed to be caused by interference with the nervous

system. They also examine patients to determine the nature and extent of the disorder. They may use supplementary measures, such as exercise, rest, water, light, heat, and nutritional therapy.

10. Dental Assistant

Nature of Work

Dental Assistant provides support to the dentist to perform dental procedures in a timely, efficient and safe manner. Dental assistant prepares for and supports patients for treatment, and assists the Dentist with clinical procedures.

Qualifications, Skills and Knowledge

Dental Assistants have a minimum of a secondary school certificate and many learn their skills on the job. However, some Dental assistants earn a Bachelor's degree in dentistry before beginning work.

Employment Opportunities and Career Pathways

Dental assistants typically work with Dentists in a clinical or hospital setting.

The potential career progression for the job role is described below.

Table 9: Career path – Dental Assistant

Sector	Allied Health and Paramedics
Sub-sector	Curative
Occupation	Dental Assistant
Leadership level	Supervisor
Middle Management level	Senior Dental Assistant
Entry Level	Dental Assistant

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Dental Assistants perform a variety of patient care, office and laboratory duties. They are different than Dental Hygienists, who must be licensed to perform different clinical tasks. They can perform the following duties:

- Work chair-side as dentists examine and treat patients
- Make patients feel comfortable in dental chair
- Prepare patients for treatment
- Obtain dental records
- Hand instruments to dentists
- Keep patients mouths dry and clear by using suction or other devices

- Sterilize and disinfect instruments and equipment
- Prepare try set-ups for dental procedures
- Instruct patients on postoperative and general oral health care
- May prepare materials for making impressions and restorations
- Expose radiography
- Process dental x-ray film as directed by a dentist
- May remove sutures
- Apply anaesthetics to gums or cavity-preventive agents to teeth
- Remove excess cement used in the filling process
- Schedule and confirm appointments
- Receive patients
- Keep treatment records
- Send bills
- Receive payments
- Order dental supplies and materials
- Make casts of teeth and mouth from impressions taken by a dentist (lab duties)
- Clean and polish removable appliances and make temporary crowns (lab duties)

11. Dental Hygienist

Nature of Work

Dental Hygienist is a licensed dental professional who specialises in preventive oral health, typically focusing on techniques in oral hygiene.

Qualifications, Skills and Knowledge

Dental hygienists typically have a Diploma in Dental Hygienist.

Employment Opportunities and Career Pathways

In India, Dental hygienists typically work within a Dental practice in a clinical or hospital setting and do not have their own set-ups. However, apart from assisting Dentists in their practice, Dental hygienists can move ahead in their careers by setting up a separate practice.

Job Description

Some of the key responsibilities of the Dental Hygienists are to remove plaque and clean and polish teeth using scaling instruments and a rotating polisher. They apply decay preventive agents such as fluorides and sealants, chart medical and dental histories, and take and develop dental x-ray films. They also screen patients, take a medical history, and add information to the patient's chart.

Dental hygienists also:

- Promote community oral health
- Perform infection control and safety procedures
- Perform risk management/ patient assessment
- Plan to provide dental hygiene treatment
- Provide preventive dental hygiene care
- Assist in providing therapeutic treatment
- Perform stress/anxiety and pain control procedures
- Maintain records, inventory and equipment
- Assure quality
- Promote and practice productivity/growth

12. Dialysis Technician

Nature of Work

Dialysis is a medical procedure in which a patient suffering from kidney failure undergoes regular treatment on a machine where the blood is drained from the system, filtered of waste products and reintroduced into the circulatory system. A dialysis session may take several hours to complete.

The dialysis technician has the responsibility of ensuring that the patient has complete knowledge of the procedure that he or she would be undergoing.

Qualifications, Skills and Knowledge

In order to become a dialysis technician, one needs to have a senior secondary school certificate. After completing schooling, one can apply to the various vocational training schools and colleges which provide training for the specific course. The technician should have knowledge of the chemicals to be mixed and the equipment to be handled.

Typically Dialysis technicians have a diploma in renal care/management or BSc. in Dialysis Technician.

Employment Opportunities and Career Pathways

Dialysis technology for haemodialysis is constantly evolving. In order for patients on dialysis to get the best treatment, technician schools offer on-going continuing education courses. Dialysis training or technicians can also take place on the job in hospitals after they have earned their certification. A technician generally works in hospitals or clinics under the direction of a nurse or a doctor. It is most important thing for a dialysis technician to remember that every patient is different and has different needs. It is the technician's duty to ensure that proper care is given to the patient including providing the necessary information.

The potential career progression for the job role is described below. Opportunities for lateral shifts to other sectors are also described.

Table 10: Career path - Dialysis Technician

Sector	Allied Health and Paramedics
Sub-sector	Curative
Occupation	Dialysis Technician
Leadership level	Dialysis in-charge
Middle Management level	Senior Dialysis Technician
Entry Level	Junior Dialysis Technician

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually*

highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.

Job Description

The main duty of a dialysis technician is to operate dialysis machines and monitor patients with kidney failure. It is their responsibility to prepare patients for dialysis. They need to take the patient's history, record blood pressure and pulse rate, and monitor them closely during dialysis.

Another responsibility is to ensure that the equipment needed for the procedure is working properly. It has to be thoroughly checked so that there is no scope for malfunction. The technician would also need to help the patient once the treatment is over so that there are no problems. After the procedure, it is the duty of the technician to ensure that the equipment is thoroughly cleaned and ready to be used for the next patient. The technician also needs to ensure that the entire area is sterile.

13. Electro-Neuro Diagnostics Technologist

Nature of Work

Electro-neurodiagnostic (END) technology is the medical diagnostic field devoted to the recording and study of electrical activity in the brain and nervous system. END technologists, also referred to as electroencephalograph (EEG) technologists, operate specialized equipment which measures and records the electrical activity of the brain, peripheral nervous system, and spinal cord.

Qualifications, Skills and Knowledge

The END curriculum includes courses on neuroanatomy, neurophysiology, electrode placement and application methods, electroencephalography, polysomnography, long-term and ICU monitoring, and intraoperative neuromonitoring.

After graduating from an END Bachelor's programme and working for a minimum of two years in the field, professionals are encouraged to undergo a national examination for professional credentials in an area of END specialty, which gives them certification in the field.

Employment Opportunities and Career Pathways

END personnel work primarily in neurology-related departments of hospitals, but many also work in clinics and the private offices of neurologists and neurosurgeons. Growth in employment within the profession is expected to be greater than average, owing to the increased use of EEG and evoked potential (EP) techniques in surgery; in diagnosing and monitoring patients with epilepsy; and in diagnosing sleep disorders. Technologists generally work a 40-hour week, but may work 12-hour days for sleep studies and be on call for emergencies and intraoperative monitoring.

The potential career progression for the job role is described below. Opportunities for lateral shifts to other sectors are also described.

Table 11: Career path - END Technician

Sector	Allied Health and Paramedics
Sub-sector	Curative
Occupation	END Technician
Leadership level	Neurology Department Co-ordinator
Middle Management level	Supervisor
	Senior END Technician
Entry Level	Junior END Technician

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Electro-neurodiagnostic technologists record electrical activity arising from the brain, spinal cord, peripheral nerves, and somatosensory or motor nerve systems using a variety of techniques and instruments.

The END technologist can be involved in one or more of the following diagnostic procedures:

- Electroencephalography (EEG)
- Evoked potential (EP)
- Polysomnography (PSG)
- Nerve conduction studies (NCS)
- Long-term epilepsy monitoring (LTM)
- Intraoperative monitoring (IOM).

The technologist:

- Takes the medical history
- Documents the clinical condition of patients; understands and employs the use of EG, EP, PSG, and NCS equipment and applies adequate recording electrodes
- Understands the interface between EEG, EP, PSG, and NCS equipment, and other electrophysiological devices and procedures
- Recognizes and understands EEG/EP/NCS/sleep activity displayed
- Manages medical emergencies in the laboratory
- Prepares a descriptive report of recorded activity for the interpreting physician.

The responsibilities of the technologist may also include laboratory management and the supervision of END technologists. END technologists understand neurophysiology and recognize normal and abnormal electrical activity. They act as eyes and ears for specially trained doctors who later review and interpret the data. Considerable individual initiative, reasoning skill, and sound judgments are all expected of the END professional.

14. Emergency and Medical Paramedic Technician

Nature of Work

Paramedics assess injuries, administer emergency medical care, and rescue trapped individuals. They transport injured or sick people to medical facilities.

Qualifications, Skills and Knowledge

Workers must complete a formal training process. Training is offered at progressive levels: Emergency Medical Technician (EMT)-Basic, and EMT-Advanced. The skills developed in the different levels of courses vary from managing respiratory, trauma, and cardiac emergencies; dealing with bleeding, fractures, airway obstruction, cardiac arrest, and emergency childbirth; to training in EMT-Shock Trauma; and learning heart rhythms and administering advanced medications.

Employment Opportunities and Career Pathways

Paramedics are usually employed in hospital or emergency medical service provider settings. Some of these workers are employed by police and fire departments, and are on call for extended periods. Advancement beyond the EMT-Advanced level usually means leaving fieldwork. An EMT-Advanced can become a supervisor, operations manager, administrative director, or executive director of emergency services. Some EMTs and paramedics become instructors, dispatchers, or physician assistants, while others move into sales or marketing of emergency medical equipment.

A number of people become EMTs and paramedics to assess their interest in healthcare and then decide to return to school and become registered nurses, physicians, or other health workers.

The potential career progression for the job role is described below.

Table 12: Career path – Emergency Medical Technician

Sector	Allied Health and Paramedics	
Sub-sector	Curative Services	Medical Devices
Occupation	Emergency Medical Technician	
Leadership level	Supervisor	Head of Sales
Middle Management level	Dispatcher	Sales Manager
	Emergency Medical Technician - Advanced	
Entry Level	Emergency Medical Technician - Basic	Sales Executive

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Paramedics are often one of the first healthcare professionals on the scene of any accident or medical emergency. They are usually one of a two-person ambulance crew, with an emergency care assistant or ambulance technician to assist them. Depending on the nature of the emergency, EMTs and paramedics are typically dispatched to the scene and often work with police and fire department personnel.

Once they arrive, they determine the nature and extent of the patient's condition while trying to ascertain whether the patient has pre-existing medical problems. Paramedics are trained to treat patients with minor injuries on the scene of an accident or at their home without transporting them to a medical facility. Emergency treatments for more complicated problems are carried out under the direction of medical doctors on site or during transport.

Paramedics are trained to drive what is in effect a mobile emergency clinic and to resuscitate and/or stabilize patients using sophisticated techniques, equipment, and drugs. They might be called out to someone who has fallen from scaffolding, for example, or an elderly person with a suspected stroke.

Based at a local ambulance station or a large hospital along with other emergency crews, they work shifts, including evenings and weekends, going out in all weathers at all hours of the night or day. They work closely with doctors and nurses in hospital accident and emergency departments, briefing them as they hand the patient over to their care.

15. Medical Assistants

Nature of Work

A Medical Assistant (MA) assists nurses and physicians with a variety of administrative and medical tasks. Medical assisting is one of many allied health careers.

Qualifications, Skills and Knowledge

Medical Assistants typically have a bachelor's degree or diploma in science or life sciences and typically learn the required skills on the job.

Employment Opportunities and Career Pathways

Most medical assistants work in a doctor's office, and some work in hospitals. Medical perform the administrative and clinical tasks that keep the offices of licensed health practitioners running smoothly. MAs are often assigned with administrative and clerical work. The medical assistant can only work in an environment where the doctor is present.

Table 13: Career path – Medical Assistant

Sector	Allied Health and Paramedics
Sub-sector	Curative
Occupation	Medical Assistant
Leadership level	Medical Service Manager
Middle Management level	Medical Secretary
Entry Level	Medical Assistant

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Medical Assistants help with a variety of tasks including checking patients in, taking vital signs, and medical record-keeping such as updating and filing charts. Medical Assistants also may give some help with medical billing and insurance coding.

They keep track of the record of patients, their admissions, filling up their insurance claim application forms and so on.

16. Mental Health Counsellor

Nature of Work

Mental health counsellors are trained professionals who offer counselling to families, individuals, groups, and couples to promote optimal mental health and well-being. The variety of services provided by a mental health counsellor includes diagnosis, therapy, educational programmes, and development of treatment plans.

Some of the issues they help people with are stress management, substance abuse, addictions, family problems, suicidal ideation, and problems with self-esteem. They help people address ageing problems, or emotional and mental health issues.

Qualifications, Skills and Knowledge

Mental Health counsellors have a minimum of a Bachelor's degree in psychotherapy and may advance in their careers through master's degrees such as MSc. Counselling & Psychotherapy and Masters in Psychotherapy and Counselling.

Employment Opportunities and Career Pathways

Many counsellors work in hospitals with psychiatric patients or with mentally ill adults in continuing day treatment programmes. Some choose private practice or practice in counselling centres, government agencies, corporations and youth homes. Some professionals also work closely with psychologists, psychiatrists, and social workers.

A mental health counsellor's discipline is new in India and details on career paths are not available.

Job Description

Mental Health counsellors:

- Maintain confidentiality of records relating to clients' treatment
- Assess patients for the risk of suicide
- Encourage clients to express their feelings and discuss what is happening in their lives, helping them to develop insights into themselves or their relationships
- Collect information about clients through interviews, observation, or tests
- Counsel clients or patients, individually or in group sessions, to assist them in overcoming dependencies, adjusting to life, or making changes
- Guide clients in the development of skills or strategies for dealing with their problems
- Develop and implement treatment plans based on clinical experience and knowledge
- Prepare and maintain all required treatment records and reports
- Evaluate clients' physical or mental condition, based on a review of client information

17. Nuclear Medicine Technologist

The first postgraduate diploma course was approved and launched in 1965 at the Radiation Medicine Centre (RMC), Bhabha Atomic Research Centre (BARC) Mumbai to cater to nuclear medicine services across India. Later, Manipal University was a pioneer in launching the BSc in Nuclear Medicine Technology and Diploma in Nuclear Medicine Technology, duly approved by Atomic Energy Regulatory Board (AERB) in 2001. AIIMS, Delhi was the first to introduce a two year postgraduate degree course, MSc in Nuclear Medicine Technology in 2003. Since then, this course has evolved over the years.

The International Atomic Energy Agency (IAEA) started coordinating research projects to train nuclear medicine technologists through a distance assisted training (DAT) programme in collaboration with the University of Sydney, Australia, to overcome the shortage of skilled human resources in India. This training programme is specially designed for unqualified working “technicians” in the nuclear medicine centres.

Nature of Work

A nuclear medicine technologist prepares and administers radiopharmaceuticals, i.e. radioactive drugs, to a patient, and then uses a camera to create images to track the activities in the tissues to show how the drug is metabolized in the patient's body in order to treat or diagnose disease. This process uses non-invasive safe techniques using radiation in minute doses. This is a specialized branch of medicine, and is multidisciplinary in nature. Nuclear medicine is still often confused with other imaging procedures, including general radiology, computerized tomography (CT), and magnetic resonance imaging (MRI), despite the distinct process of patient care.

Qualifications, Skills and Knowledge

To work as a nuclear medicine technologist one must complete a nuclear medicine technology programme. Typically nuclear medicine technologists have a Master's degree in Nuclear Medicine, though some may have a Bachelor's degree.

In order to progress in their career they may opt for certification as Radiation Safety Officer through an examination given by BARC. They may also go in for doctorates in the discipline.

Employment Opportunities and Career Pathways

A nuclear medicine technologist has scope to work in multiple settings such as hospitals, therapeutic centres, teaching institutes, or research firms. With experience, a nuclear medicine technologist is promoted to a supervisory position or as chief technologist. With further education one can be a department administrator or director. Some technologists specialize in clinical areas, such as nuclear cardiology or positron emission tomography (PET) scanning.

Some become instructors in, or directors of, nuclear medicine technology programmes, a step that usually requires a Bachelor's or Master's degree in the subject.

Others may leave the occupation to work as sales or training representatives for medical equipment or radiopharmaceutical manufacturing firms; some become radiation safety officers in regulatory agencies or hospitals. The potential career progression for the job role is described below.

Table 14: Career path – Nuclear Medicine Technologist

Sector	Allied Health and Paramedics		
Sub-sector	Curative	Medical Devices Industry	Academics
Occupation	Nuclear Medicine Technologist		
Leadership level	Chief Technologist	CEO	Principal
Middle Management level	Supervisor/ Radiation Safety Officers	Head of Sales	Vice Principal
		Sales Manager/ Application Manager	Senior Lecturers
Entry Level	Senior technologist	Sales executive/ Application Specialist	Lecturers
	Junior technologist		Tutors

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Nuclear Medicine Technologists:

- Administer radiopharmaceuticals or radiation intravenously to detect or treat diseases using radioisotope equipment, under the direction of a physician.
- Detect and map radiopharmaceuticals in patients' bodies, using a camera to produce photographic or computer images.
- Produce a computer-generated or film image for interpretation by a physician.
- Calculate, measure, and record radiation dosage or radiopharmaceuticals received, used, and disposed, using a computer and following the physician's prescription.
- Perform quality control checks on laboratory equipment and cameras.
- Maintain and calibrate radioisotopes and laboratory equipment.
- Dispose of radioactive materials and store radiopharmaceuticals according to radiation safety procedures.
- Process cardiac function studies using a computer.
- Prepare stock radiopharmaceuticals adhering to safety standards that minimize radiation exposure to workers and patients.
- Record and process the results of procedures

18. Optician

Nature of Work

Opticians help in selecting and fitting eyeglasses and contact lenses for people with eye problems, as per the prescriptions written by ophthalmologists or optometrists. In order to remake eyeglasses or contact lenses, they verify the prescription from the patient's history.

Qualifications, Skills and Knowledge

In India, there is huge population of opticians, mostly shop owners who do not have any formal training in eye care. Those based in hospitals or clinics are provided with in-house training.

Employment Opportunities and Career Pathways

Opticians typically have a Diploma in Optometry & Refraction Technique. Post completion of the relevant course, the candidate may find opportunities in optical showrooms, eye clinics, and the contact lens industry as sales executives. Eventually, they may progress to become managers. They may also open their own shops.

Job Description

- Verify that finished lenses are ground to specifications
- Prepare work orders and instructions for grinding lenses and fabricating eyeglasses
- Measure clients' bridge and eye sizes, temple length, vertex distance, papillary distance, and optical centres of the eyes, using measuring devices
- Heat, shape, or bend plastic or metal frames to adjust eyeglasses to fit clients, using pliers and the hands
- Evaluate prescriptions in conjunction with clients' vocational and avocational visual requirements
- Assist clients in selecting frames according to style and colour, and ensure that frames are coordinated with facial and eye measurements and optical prescriptions
- Fabricate lenses to meet prescription specifications
- Maintain records of customer prescriptions, work orders, and payments
- Recommend specific lenses, lens coatings, and frames to suit client needs
- Instruct clients in how to wear and care for eyeglasses

19. Optometrist

In India, optometry was introduced in the late 1950s, when the government realized that burdening ophthalmologists with conducting refractions was not in the best interest of the healthcare system. At the same time, the government also wanted to protect the public from exploitation by unqualified opticians.

According to the Association of Schools and Colleges of Optometry (ASCO), at present there are 48 schools and colleges offering Bachelor's, Master's, and PhD degrees to aspiring candidates across India.

Nature of Work

Optometrists or optometric physicians are vision care experts. Optometry is a healthcare profession that is autonomous, educated, and regulated (licensed/registered), and optometrists are the primary healthcare practitioners of the eye and visual system who provide comprehensive eye and vision care, which includes refraction and dispensing, detection/diagnosis and management of disease in the eye, and the rehabilitation of conditions of the visual system.

They conduct eye testing, diagnose visual problems, prescribe orthoptics and vision training, provide optometric counselling and exercises to patients with partial sight, colour blindness, and hereditary vision defects, and are also responsible for prescribing medication and designing and fitting of spectacles, contact lenses and low-vision aids.

Though optometry and ophthalmology are both concerned with visual impairments and disorders, optometrists should not be confused with ophthalmologists or dispensing opticians. An optometrist performs all the tasks of an ophthalmologist, except for surgical procedures.

Qualifications, Skills and Knowledge

To practise in India, a candidate must have professional training in optometry. Levels of qualification offered in India are:

- Bachelor of Clinical Optometry
- Bachelor of Optometry & Ophthalmic Technique
- Diploma in optometry or ophthalmic techniques
- M.Sc. Optometry
- M.Phil. Optometry
- Ph.D. Optometry

These range from 2 year (Diploma in optometry or ophthalmic techniques) and three year (BSc Hons. in Optometry) courses to four year courses (Bachelor of Clinical Optometry). One year courses for vision technician are also available.

Higher education opportunities for specialisation or career progression are available through postgraduate and doctoral degrees in research and clinical practice.

Employment Opportunities and Career Pathways

Most optometrists work in the eye departments of hospitals. They may also have an independent practice in their own eye clinics, work in optical shops and lens manufacturing units. Some optometrists prefer to specialize further in fields such as contact lenses, geriatrics, and paediatrics or vision therapy.

Optometrists can also seek employment with any multinational organization dealing with eye care products as executives, or take up academic teaching as a career.

Optometrists opting for academic teaching may study for a Master's or PhD. degree in the same discipline or in related fields such as public health, health administration, or health education.

The potential career progression for the job role is described below. Opportunities for lateral shifts to other sectors are also described.

Table 15: Career path – Optometrist

Sector	Allied Health and Paramedics		
Sub-sector	Curative Services	Lens/ Camera Industry	Academics
Occupation	Optometry		
Leadership level	Head of Optometry	Head of Sales	Principal
Middle Management level	Optometry Development Manager	Sales Manager	Vice Principal
	Optometrist / Refractionist		Lecturer
Entry Level	Optical Assistant	Sales Executive	Tutor

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

- Examine the eyes, using observation, instruments, and pharmaceutical agents, to determine visual acuity and perception, focus and coordination, and to diagnose diseases and other abnormalities such as glaucoma or colour blindness
- Prescribe medications to treat eye diseases if laws permit
- Prescribe, supply, fit, and adjust eyeglasses, contact lenses and other vision aids
- Analyse test results and develop a treatment plan
- Educate and counsel patients on contact lens care, visual hygiene, lighting arrangements, and safety factors
- Remove foreign bodies from the eye
- Consult with and refer patients to the ophthalmologist or other healthcare practitioner if additional medical treatment is necessary

- Provide patients undergoing eye surgeries, such as cataract and laser vision correction, with pre- and postoperative care
- Prescribe therapeutic procedures to correct or conserve vision
- Provide vision therapy and low vision rehabilitation

20. Surgical Technologist/ OT Technician

Nature of Work

Surgical technologists are responsible for assisting in surgical operating procedures under the supervision of surgeons, nurses, and other practitioners. They are also called scrubs, and surgical or operating room technicians.

Qualifications, Skills and Knowledge

A diploma or certificate is the most common level of education among surgical technologists, referred to as Operation Theatre technologist/technician in India.

Employment Opportunities and Career Pathways

Surgical technologists specifically work in hospitals, mainly in operating and delivery rooms. They may also work with physicians or dentists who perform outpatient surgery and in outpatient care centres, including ambulatory surgical centres.

Experienced candidates may specialize further in areas of surgery, such as neurosurgery or open-heart surgery. The potential career progression for the job role is described below.

Table 16: Career path – OT Technician

Sector	Allied Health and Paramedics
Sub-sector	Curative Services
Occupation	Surgical Care
Leadership level	Operations Manager
Middle Management level	Senior Operation Theater Supervisor
Entry Level	Surgical First Assistant
	Operating Theatre Technician

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

- Maintain a proper sterile field during surgical procedures
- Count sponges, needles, and instruments before and after the operation
- Hand instruments and supplies to surgeons and surgeons' assistants, hold retractors and cut sutures, and perform other tasks as directed by the surgeon during operation
- Prepare patients for surgery, including positioning patients on the operating table and covering them with sterile surgical drapes to prevent exposure

- Scrub arms and hands, and assist the surgical team to scrub and put on gloves, masks, and surgical clothing
- Wash and sterilize equipment using germicides and sterilizers
- Monitor and continually assess operating room conditions, including patient and surgical team needs
- Prepare dressings or bandages, and apply or assist with their application following surgery
- Clean and restock the operating room, gathering and placing equipment and supplies, and arranging instruments according to instructions, such as a preference card
- Operate, assemble, adjust, or monitor sterilizers, lights, suction machines, or diagnostic equipment to ensure proper operation



JOB ROLES IN THE NON-DIRECT CARE SUB-SECTOR

Job Roles in the Non-Direct Care Sub-Sector

21. Dental Laboratory Technician

Nature of Work

Dental Lab Technician works closely with and in direction from Dentists to fabricate dental prostheses to replace or restore missing or damaged teeth. Dental laboratory technicians use impressions, or moulds, of a patient's teeth to create crowns, bridges, dentures and other dental appliances. They work closely with dentists but have limited contact with patients.

Qualifications, Skills and Knowledge

Dental laboratory technicians typically have a Diploma in Dental Mechanics or a Bachelor's degree in Dentistry.

Employment Opportunities and Career Pathways

Dental laboratory technicians work in large, stand-alone laboratories or in laboratories attached to clinics or hospitals. The potential career progression for the job role is described below.

Table 17: Career path – Dental Laboratory Technician

Sector	Allied Health and Paramedics		
Sub-sector	Non-Direct Care	Academics	Medical Device Industry
Occupation	Dental Laboratory Technician		
Leadership level	Team Leader/ Lab Manager	Principal	CEO
Middle Management level	Section in-charge/ Section Head	Vice Principal	Head of Sales
	Senior Lab Technician	Senior Lecturer	Sales Manager/ Application Manager
Entry Level	Lab technician	Lecturer	Sales executive/ Application Specialist
	Junior lab technician	Tutor	
	Phlebotomist		

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Dental laboratory technicians work with small hand tools, such as files and polishers. They work with many different materials to make prosthetic appliances, including wax, plastic, and porcelain. In some cases, technicians work with computer programs to create appliances or to get impressions sent from a dentist's office.

In small laboratories, technicians do all stages of the work. In large laboratories, technicians may work on only one step of the process, such as waxing or polishing appliances.

Dental laboratory technicians can specialize in one of six areas: orthodontic appliances, crowns and bridges, complete dentures, partial dentures, implants, and ceramics. Technicians may have different job titles, depending on their specialty. For example, technicians who make porcelain and acrylic restorations, such as veneers and bridges, are called dental ceramists.

Dental laboratory technicians typically do the following:

- Follow detailed work orders and prescriptions from a dentist, to create a dental appliance
- Mix plaster and other pastes to fill moulds from impressions taken by a dentist
- Cover moulds and frameworks with mixtures and allow them to set
- Place the dental appliance on an apparatus that mimics the patient's bite and jaw movement
- Examine the appliance, noting the size and shape of adjacent teeth and gaps in the gum line
- Sculpt or carve parts of an appliance, such as individual teeth
- Adjust prosthetics to allow for a more natural look or to improve function
- Repair dental appliances that may be cracked or damaged, such as dentures and crowns

22. Dietician and Nutritionist

Nature of Work

Dietetics is the science of interpreting and communicating the science of nutrition to enable people to make informed and practical choices about food and lifestyle, in both health and disease.

Registered dietitians are nutritionists who integrate and apply the principles derived from the sciences of food, nutrition, biochemistry, physiology, food management, and behaviour to achieve and maintain the health status of the public they serve. They help prevent and treat illnesses by promoting healthy eating habits and suggesting diet modifications, such as less salt for those with high blood pressure, or reduced fat and sugar intake for those who are overweight. They plan and conduct food service or nutritional programmes to assist in the promotion of health and disease control. Nutrition is the study of nutrients in food, how nutrients are used by the body, and the relationship between diet, health and disease. A nutritionist advises on the impact of food and nutrition on health, the two terms generally being used interchangeably.

Qualifications, Skills and Knowledge

A minimum of two years' training is required at the graduate degree level. Postgraduate dietetic programmes vary from six months to two years, depending on the study design and integration into a graduate programme. Dietitians train in both hospital and community settings as part of their course.

In India, the profession is backed by a national professional body called the Indian Dietetic Association, which functions through its National Executive Body. It also has a registration board to facilitate the entry of professionals in the field by conducting an annual examination. Though this body does not have statutory backing, it still functions to unite the members.

Employment Opportunities and Career Pathways

Clinical registered dietitians are a vital part of the medical team in hospitals, nursing homes, health maintenance organizations, and other healthcare facilities. Dietitians have emerged as key members of a healthcare team.

There are a variety of careers within the field of food science and technology. Most of the major food manufacturers and retailers employ nutritionists and food scientists but opportunities also arise in research, education and journalism. Opportunities for advancement are available by choosing a particular area of nutrition practice, such as diabetes, heart disease, or paediatrics, or by expanding into hospital administration. Registered dietitians work in public and home health agencies, day-care centres, health and recreation clubs, and counsel families, the elderly, pregnant women, children, and individuals with special needs.

They can even work in colleges, universities, and medical centres, teaching future physicians, nurses, dietitians, and dietetic technicians the science of foods and nutrition. Dietitians can also find scope as researchers to work in government agencies, food and pharmaceutical companies, and major

universities and medical centres. They can have a private practice for nutrition screening and assessment of their own clients and those referred to them by physicians. They can counsel on weight loss, cholesterol reduction, and a variety of other diet-related concerns.

The typical career path for the job role is described below.

Table 18: Career path – Dietician Assistant

Sector	Allied Health and Paramedics
Sub-sector	Non-Direct Care
Occupation	Dietary Assistant
Leadership level	Head of Department/ Floor Manager/ Departmental Manager
Middle Management level	Senior Dietician
Entry Level	Dietician
	Dietary Assistant

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Dieticians and nutritionists plan food and nutrition programmes, and supervise the preparation and serving of meals. Dieticians work with people who have special dietary needs, inform the general public about nutrition, give unbiased advice, evaluate and improve treatments and educate clients, doctors, nurses, health professionals, and community groups. Major areas of practice include clinical, community, management, and consultant dietetics.

23. Home Health Aide

The concept of home health aides and personal and home care aides is not well established in India. However, with the increasing geriatric population, there is a felt need for introducing this cadre into the existing system.

It is well documented that an important effect of chronic diseases in an ageing population is limitation in functional abilities, or “disability”. The inability to perform some key activities (e.g. basic mobility, feeding, personal hygiene, and safety awareness) leads to “dependency” – the need for human help (or care) beyond that customarily required by a healthy adult. Most such help is given by family members or other “informal” carers.

Foreseeing the associated problems, the Central Government introduced many programmes and policies pertaining to the ageing population such as National Policy for Older Persons introduced in 1999, National Initiative on Care for Elderly (a project under the Ministry of Social Justice & Empowerment), National Programme for the Health Care of the Elderly (NPHCE), to name a few.

Nature of Work

Home health aides and personal and home care aides provide routine personal healthcare to people who are disabled, chronically ill, or cognitively impaired and older adults who may need assistance, live in their own homes, or in residential facilities instead of in health facilities or institutions. They also assist in the activities of daily living and enable the individual to lead a normal life. They work under the direct supervision of nurses and medical professionals. They keep a record of services provided to the patient and changes in the client’s condition.

Qualifications, Skills and Knowledge

Typically home health aides have a minimum of a secondary school certificate, though some go on to complete graduate level course work in a life sciences related field.

Employment Opportunities and Career Pathways

Most of the home health aides and personal and home care aides work in the homes of the elderly helping out with homemaker duties. With experience and training, they may take on more personal care duties. Some aides receive additional training to become nursing aides, licensed practical nurses, or registered nurses. Some may start their own home care agency or work as a self-employed aide.

Job Description

- Maintain records of patient care, condition, progress, or problems to report, and discuss observations with the supervisor or case manager
- Check patients' pulse, temperature, and respiration
- Provide patients with help in moving in and out of the bed, bath, wheelchair, or automobile, and with dressing and grooming

- Care for patients by changing bed linen, doing the laundry, cleaning, or assisting with their personal care
- Entertain, converse with, or read aloud to patients to keep them mentally healthy and alert
- Administer prescribed oral medications under the written direction of a physician or as directed by the home care nurse or aide, and ensure that patients take their medicines
- Plan, purchase, prepare, or serve meals to patients or other family members, according to prescribed diets
- Accompany clients to doctors' offices or on other trips outside the home, providing transportation, assistance, and companionship
- Direct patients to perform simple prescribed exercises or in the use of braces or artificial limbs
- Provide patients and families with emotional support and instruction in areas such as caring for infants, preparing healthy meals, living independently, or adapting to disability or illness

24. Medical Equipment Technician

Nature of Work

Medical Equipment Technicians (METs) do not personally care for patients; however they play a vital role in patient care. They inspect, maintain, and repair the diagnostic, monitoring, therapeutic, and life-saving medical equipment – defibrillators, ventilators, monitors, medical imaging devices, clinical laboratory equipment and others – that are found in every hospital and medical clinic.

Examples of different areas of Medical equipment technology are:

- Diagnostic Imaging
 - Radiographic and fluoroscopic X-ray
 - Diagnostic ultrasound
 - Mammography
 - Nuclear Imaging
 - Positron emission tomography (PET)
 - Medical imaging
 - Computed Tomography (CT) Linear Tomography
 - Picture archiving and communication systems (PACS)
 - Magnetic Resonance Imaging (MRI scanner)
- Biomedical Technology
- Dental
- Heart Lung Device
- Optometry
- Surgical Instruments
- Infusion pumps
- Surgical instruments
- Anaesthesia
- Laboratory
- Dialysis
- Respiratory Services (ventilators)
- Cardiac Diagnostics

Qualifications, Skills and Knowledge

There are a number of possible pathways to becoming a MET. Many Medical Equipment Technicians come from trades backgrounds, such as mechanics or electronics. A diploma or degree in Engineering (Electrical, Electronics or Mechanics) or related areas (Biomedical technology) is also a qualification for this field.

Employment Opportunities and Career Pathways

METs are employed by medical devices companies, hospitals, clinics and laboratories to maintain and repair the medical equipment in these settings. In many cases, the primary employers are

Medical Device companies who sign annual maintenance contracts with hospitals, clinics and laboratories. The METs are then sent over to the hospital (or other users of medical devices) when required for inspection, calibration, repair and maintenance.

Experienced or METs with higher qualifications may move into affiliated functions such as sales in the Medical Device companies.

Job Description

METs work closely with nursing staff and Medical Material personnel to obtain parts, supplies, and equipment and even closer with facility management to coordinate equipment installations requiring certain facility requirements/modifications. They help to train staff on usage and care of new equipment and conduct repairs where required.

METs may perform the following tasks:

- Install and carry out acceptance testing of biomedical equipment and support systems
- Conduct preventative maintenance and repair broken equipment
- Inspect, test and calibrate medical devices and technology
- Conduct safety testing & standards compliance
- Support the assessment of technology for the purchase of new equipment
- Train and educate operators of medical equipment

25. Medical Records and Health Information Technician

Nature of Work

Medical records are a systematic way of storing required information and other relevant documents for availability and ease of accessibility at the time of need.

A medical records and health information technician is responsible for assembling patients' health information comprising the medical history, symptoms, examination results, diagnostic tests, treatment methods, and all other healthcare provider services ensuring their quality, accuracy, accessibility, and security. They are in close communication with healthcare professionals and providers. Medical record-keeping is an essential part of the healthcare system. In today's healthcare environment, where there has been a tremendous change in the use of technology for multi-specialty care, changing healthcare networks, and consumers transferring to different providers, the need for comprehensive, accurate medical records needs to be emphasized.

Qualifications, Skills and Knowledge

Medical records technicians typically have a Bachelor's degree and learn their skills on the job or undertake a Certificate Course in Medical Records Keeping.

A Bachelor's degree or diploma (Diploma in Medical Records Technology or B.Sc. in Medical Records & Health Information Technology) specific to Medical records technology is available in the field of medical record-keeping in India.

Due to advances technology and the introduction of e-record management, however, such technicians are in huge demand, specifically in private sector.

In India, the training for this discipline is still very limited. The Central Bureau of Health Intelligence offers in-service training courses for medical record technicians (MRT, 6 months) and medical record officer (MRO, 1 year) conducted at Safdarjung Hospital, New Delhi and JIPMER, Pondicherry. A degree course in Bachelor of Medical Record Technology is also conducted by Dr MGR Medical University in Tamil Nadu and a few other colleges across India.

Employment Opportunities and Career Pathways

Experienced medical records and health information technicians usually progress in their careers by either specializing further or rising to managerial roles. Many senior technicians specialize in coding, particularly medical coding, or in tumour registry.

Medical record technicians and officers work at medical facilities such as hospitals, clinics and nursing care facilities. As this is still a nascent field in India, information on career paths is limited.

Job Description

Medical Records Technicians typically carry out the following:

- Protect the security of medical records to ensure that confidentiality is maintained

- Review records for completeness, accuracy, and compliance with regulations
- Retrieve patient medical records for physicians, technicians, or other medical personnel
- Release information to persons or agencies according to regulations
- Plan, develop, maintain, or operate a variety of health record indexes or storage and retrieval systems to collect, classify, store, or analyse information
- Enter data, such as demographic characteristics, history and extent of disease, diagnostic procedures, or treatment into the computer
- Compile and maintain patients' medical records to document their conditions and treatments, and to provide data for research or cost control and care improvement efforts
- Process and prepare business or government forms
- Process patient admission or discharge documents

26. Medical Transcriptionist

The profession of medical transcription was initiated in 1960 although it gained momentum in the 1990s. It is an upcoming discipline in India.

Nature of Work

Medical transcriptionists transcribe dictated recordings made by physicians and other healthcare professionals, including history and physical reports, office and clinic notes, operative reports, consultation notes, discharge summaries, letters, evaluations, laboratory, X-ray and pathology reports. They translate medical jargon and abbreviations into their expanded forms so that the report becomes clear to the reader. They edit as necessary and return the report either in printed or electronic form to the physician for review and signature.

Qualifications, Skills and Knowledge

The ideal qualification for a medical transcriptionist is a Bachelor's degree with skills in English comprehension. A training course in Medical Transcription is an added advantage. A medical transcriptionist needs to be updated throughout the career with changes in medical terminologies, procedures, etc. and should have the ability to detect medical inconsistencies in dictation and correct poor grammar and syntax.

Employment Opportunities and Career Pathways

Medical transcriptionists advance to supervisory positions, home-based work, editing, proof reading, consulting, or teaching. Some start up their own business in medical transcription.

They may also advance into other professions such as medical records and health information technicians or administrators and medical coders, with additional education or formal training.

In India, the profession may be practised in a doctor's office, insurance company, attorney's office, a company marketing medical products, or a medical book publisher, to name a few. Many companies hire graduating candidates as trainees and eventually develop their skills in-house through extensive exposure. With experience, one can become a supervisor, editor, trainer or manager of a medical transcription unit.

The typical career path for the job role is described below.

Table 19: Career path – Medical Transcriptionist

Sector	Allied Health and Paramedics
Sub-sector	Non-direct care
Occupation	Medical Transcriptionist
Leadership level	Manager of Medical Transcription Unit
Middle Management level	Supervisor
	Editor/ Trainer
Entry Level	Medical Transcriptionist

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

Medical transcriptionists:

- Transcribe dictation for a variety of medical reports, such as patient histories, physical examinations, emergency room visits, operations, chart reviews, consultations, or discharge summaries
- Review and edit transcribed reports or dictated material for spelling, grammar, clarity, consistency, and proper medical terminology
- Distinguish between homonyms and recognize inconsistencies and mistakes in medical terms, referring to dictionaries, drug references, and other sources on anatomy, physiology, and medicine
- Return dictated reports in printed or electronic form for physician's review, signature, and corrections, and for inclusion in patients' medical records
- Translate medical jargon and abbreviations into their expanded forms to ensure the accuracy of patient and healthcare facility records
- Take dictation using either shorthand or a stenotype machine, or using headsets and transcribing machines; then convert dictated materials or rough notes to written form
- Identify mistakes in reports and check with doctors to obtain the correct information
- Perform data entry and data retrieval services, providing data for inclusion in medical records and for transmission to physicians
- Prepare medical reports, correspondence, records, patient-care information, statistics, medical research, and administrative material
- Answer queries on the progress of medical cases within the limits of confidentiality laws

27. Nursing Assistant

Nature of Work

Nursing assistants, sometimes called general duty assistants (GDA), nurse aides, orderlies and geriatric aides, assist in the care of patients.

Qualifications, Skills and Knowledge

Nursing assistants usually have a secondary school certificate and learn their skills on the job.

Employment Opportunities and Career Pathways

Nursing Assistants typically work in hospitals, clinics or nursing homes.

The typical career path for the job role is described below.

Table 20: Career path – General Duty Assistant/ Nursing Assistant

Sector	Allied Health and Paramedics		
Sub-sector	Non-Direct Care	Diagnostic Services	Curative Services
Occupation	General Duty Assistant	Radiology Technician	Dialysis Technician
Leadership level	Housekeeping Supervisor	Supervisor	Dialysis in-charge
Middle Management level	GDA Supervisor	Senior Radiology Technologist	Senior Dialysis Technician
Entry Level	GDA – OT/ Radiology/ ICU	Radiology Technologist	
	General Duty Assistant	Radiology Technician*	Dialysis Technician*

Job Description

They work under the direction and supervision of registered nurses and other medical staff. Nursing assistants have a great deal of contact with patients and provide personal care such as bathing, feeding and dressing. They also perform support functions such as transporting patients, taking vital signs, making beds, helping patients become ambulatory and answering patient calls. They might also be called upon to set up equipment such as X-ray machines and overhead irrigation bottles. Nursing assistants are often responsible for observing and reporting how patients respond to the care that is being given. Nursing assistants employed in nursing homes are called geriatric aides.

They also:

- Assist Nurses in looking after the patients
- Transport the patients to the various areas of the Hospitals as or when asked
- Run errands and carry messages

- Clean and dusts beds doors windows and other furniture
- Render first aid to the patients when required
- Prepare dead bodies, arrange their transportations to the mortuary and assist in terminal disinfections

28. Pharmacy Technician

Nature of Work

Working under the direct supervision of a licensed pharmacist, the pharmacy technician prepares and dispenses prescribed medicines and pharmaceutical preparations.

Qualifications, Skills and Knowledge

Most Pharmacy Technicians have a secondary school certificate and learn their skills on the job. In some cases, they may be certified as Pharmaceutical assistants.

Employment Opportunities and Career Pathways

Pharmacy technicians assist pharmacists in pharmacies, hospitals and other medicine dispensing clinical settings. Career opportunities without further studies are limited, though Pharmacy technicians may go on to open their own shops/ pharmacies.

Job Description

A Pharmacy Technician undertakes compound preparations according to prescriptions issued by medical officers and is responsible for procuring, storing and issuing pharmaceutical materials and supplies. He also maintains files and records, and submits required pharmacy reports.

A Pharmacy Technician:

- Compounds and dispenses prescriptions according to the prescriptions of doctors
- Initiates indents, storage and maintenance of stocks and accounting of medical supplies and appliances
- Receives written prescription or refill requests and verifies that information is complete and accurate
- May also establish or maintain patient profiles, including lists of medications taken by individual patients
- Maintains proper storage and security conditions for drugs
- Answers telephones, responding to questions or requests
- Prepacks bulk medicines, fills bottles with prescribed medications, and types and affixes labels
- Mixes pharmaceutical preparations, according to written prescriptions
- Cleans and helps maintain equipment or work areas and sterilize glassware, according to prescribed methods
- Prices and files prescriptions that have been filled
- Assists customers by answering simple questions, locating items, or referring them to the pharmacist for medication information
- Receives and stores incoming supplies, verify quantities against invoices, check for outdated medications in current inventory, and inform supervisors of stock needs and shortages

29. Physician's Assistant

With the advancement of technology and expansion of knowledge, medical subspecialties are gaining importance. As most aspire towards specialist positions, there is a huge dearth of individuals in junior positions. To address this, a physician assistant training programme was started in 1992 at the Madras Medical Mission, which has been greatly welcomed by both the medical fraternity and patients. Since then, more universities have started the programme.

Nature of Work

Physician assistants (PAs) are experts providing healthcare services under the supervision of physicians. They are distinct from medical assistants who perform routine clinical and clerical activities. PAs are formally trained for diagnostic, therapeutic, and preventive healthcare services, as delegated by a physician. They are responsible for taking medical histories, examining and treating patients, writing case histories, ordering and interpreting laboratory tests and X-rays, making diagnoses under a physician's supervision, as well as counselling patients. They may also work as assistants to surgeons at the time of surgery.

Qualifications, Skills and Knowledge

In India, a PA must complete a four-year degree programme (with internship in the fourth year) in order to practice in a hospital setting.

Employment Opportunities and Career Pathways

Apart from working as PAs, they may get placements in diverse fields such as medical software institutions, the pharmaceutical industry, medical device manufacturing organizations, medical tourism, and medical insurance. They may even coordinate clinical trials in laboratories. In India, at present there are more than 300 PA graduates employed in various hospitals.

Job Description

- Examine patients to obtain information about their physical condition.
- Interpret diagnostic test results for deviations from normal.
- Obtain, compile, and record patient medical data, including health history, progress notes, and results of physical examination.
- Make tentative diagnoses and decisions about the management and treatment of patients.
- Prescribe therapy or medication with physician approval.
- Administer or order diagnostic tests, such as X-rays, ECGs, and laboratory tests.
- Perform therapeutic procedures, such as injections, immunizations, suturing and wound care, and infection management.
- Instruct and counsel patients about prescribed therapeutic regimens, normal growth and development, family planning, emotional problems of daily living, and health maintenance.
- Provide physicians with assistance during surgery or complicated medical procedures.

- Visit and observe patients on hospital rounds or house calls, updating charts, ordering therapy, and reporting back to the physician.



JOB ROLES IN THE REHABILITATIVE CARE SUB-SECTOR

Job Roles in the Rehabilitative Care Sub-Sector

30. Audiologist

Nature of Work

Audiology is an Allied Health career where professionals are qualified by special training, education, skills and experience to provide healthcare services and treatment. Audiologists work with people who have hearing, balance, and related ear problems. They examine individuals of all ages and identify those with the symptoms of hearing loss and other auditory, balance, and related sensory and neural problems. They provide consultative, diagnostic, assessment, and direct treatment services to individuals of all age groups. They develop and oversee screening programmes to detect individuals with hearing impairment. They are responsible for the design of hearing conservation programmes and treatment plans, and implement and coordinate them.

Job Qualifications

In India, although this particular specialization is emerging, due to the absence of career progression in the field, the level of specialization is up to BSc. or MSc. The minimum qualification for getting a good start-up job is a master's degree. In India, this profession is categorized under the rehabilitation field and is thus regulated by the Rehabilitation Council of India (RCI), which determines the training and other educational programmes, and grants licenses to institutes for offering the course. However, the RCI has minimal control over the profession as such.

Employment Opportunities and Career Pathways

The job titles for professionals working in this field include Audiologist, Programme Director, Rehabilitation Counsellor, and Sign Language Interpreter. These professionals can work both in government as well as private settings, public-funded settings, government agencies, hospitals and rehabilitation centres. Audiologists may independently carry out treatment programmes. They can also work in the field of research, and development of equipment and techniques for diagnosing and treating these disorders. They may also manage the business aspects of running an office, such as developing a patient base, hiring employees, keeping records, and ordering equipment and supplies.

Audiologists working in hospitals and clinics can advance to management or supervisory positions.

Job Description

The work of an audiologist is more of a technical nature requiring attention to detail, the ability to complete tasks, intense concentration, and a lot of social interaction. Audiologists provide direct clinical services to individuals with hearing or balance disorders. They may independently develop and carry out treatment programmes. In a variety of settings, they work as members of interdisciplinary professional teams in planning and implementing service delivery for children and adults, from birth to old age. Similar to speech–language pathologists, audiologists keep records on

the initial evaluation, progress, and discharge of clients. These records help pinpoint problems, track client progress, and justify the cost of treatment when applying for reimbursement.

31. Occupational Therapist

The first occupational therapy school in India was started at the Seth GS Medical College & KEM Hospital in the 1950s. This was Asia's first OT School. It started with a two-year diploma programme, which was later upgraded to a three-year degree programme. Currently, all the recognized programmes have been upgraded to four-and-a-half years (four years of academics and six months of compulsory rotatory internship)

The degree programme started in 1967 and the Master's programme in 1979. In the past few years, universities have started PhD programmes with Manipal University leading the way.

The All India Occupational Therapist's Association (AIOTA) was formed in 1952 and got registered in 1955. AIOTA is also the founder member of the World Federation of Occupational Therapy in 1952. In the absence of a central council, AIOTA regulates the OT education and practice in India and has 25 OT institutes on its list.

Nature of Work

Occupational therapists assess, plan, and organize rehabilitative programmes for individuals with physical, mental, or emotional impairments to improve their ability to perform activities both at home and at work. They help patients to perform activities of daily living and encourage them to live life independently.

Occupational therapists assist people with varying degrees of disability and impairment, ranging from partial disability such as problems associated with lack of coordination and gait impairments, to complete disability due to spinal cord injuries or muscular dystrophy, to name a few. Some may need exercises to enhance their physical strength and visual perception, and some may just need to re-acquire the ability to perform basic daily functions such as dressing, eating, cooking, and using computers. Patients with permanent disabilities need training in the use of mobility aids (e.g. wheel chair), and aids for eating and dressing.

Qualifications, Skills and Knowledge

The occupational therapist in India enters the field with a Bachelor's (four years), Master's (two years), or Doctoral degree.

Employment Opportunities and Career Pathways

Most occupational therapists work in hospitals, government and private agencies, rehabilitation centres, day-care clinics, and nursing homes. They may also become teachers and consultants.

Therapists who gain years of experience in the field become liable for promotion and may be assigned clinical and academic positions such as senior therapists and directors of occupational therapy programmes.

Job Description

- Plan, organize, and conduct occupational therapy programmes in hospital, institutional, or community settings to help rehabilitate those impaired because of illness, injury, or psychological or developmental problems
- Test and evaluate patients' physical and mental abilities, and analyse medical data to determine realistic rehabilitation goals for patients
- Select activities that will help individuals learn work and life-management skills within the limits of their mental and physical capabilities
- Evaluate patients' progress and prepare reports that detail progress
- Complete and maintain necessary records
- Train caregivers on how to provide for the needs of a patient during and after therapy
- Recommend changes in patients' work or living environments, consistent with their needs and capabilities
- Develop and participate in health promotion programmes, group activities, or discussions to promote client health, facilitate social adjustment, alleviate stress, and prevent physical or mental disability
- Consult with the rehabilitation team to select activity programmes and coordinate occupational therapy with other therapeutic activities
- Plan and implement programmes and social activities to help patients learn work and school skills and adjust to handicaps

32. Orthotist and Prosthetist

Prosthetic and Orthotic (P&O) services started in 1964, primarily to make appliances for patients with Hansen disease. The Department of Physical Medicine and Rehabilitation was also started around the same time in India. The Physiotherapy, Occupational Therapy, and P&O Services Departments function from the same block as part of the Physical Medicine and Rehabilitation (PMR) Department. Today, this has become even more multifaceted, serving departments such as Orthopaedics, Endocrinology, Neurology, Developmental Paediatrics, Surgery and Haematology.

A diploma in P&O, also named Rehabilitation Engineering, was started in 1992. The course is recognized by the Rehabilitation Council of India (RCI), a statutory body in recognizing rehabilitation courses. The two-year course is followed by six months of compulsory internship. The course has evolved over a period of time and has now been upgraded to four-and-a-half years (four years of academics and six months of compulsory rotatory internship).

Nature of Work

Orthotists and prosthetists deal with the rehabilitation of physically handicapped individuals who suffer from limb loss or other limb abnormalities. These may be the result of an accident, due to an emergency amputation of the limb as in case of gangrene, or a congenital birth defect.

The orthotist evaluates patients' needs and then designs, makes, and fits braces or other strengthening devices to support the patient's weak limbs or to correct the limb deformity. The prosthetists designs and makes prosthetic devices, otherwise known as artificial limbs.

Prosthesis is an extension or replacement of the missing limb. Prosthetists also teach patients how to use and care for their devices, and how to care for the body part to which the device is attached. They are also responsible for follow-up care.

A trained P&O is capable of handling the majority of cases and, most importantly, is able apply science and mechanics to the design, fabrication, and fitting of appliances.

Qualifications, Skills and Knowledge

In India, the minimum educational requirement to practise this science is a four-and-a-half-year degree in Prosthetics and Orthotics from a recognized university. After graduation, candidates must register with the Rehabilitation Council of India. Candidates with a diploma qualification (two-year course) are employed as technicians.

Employment Opportunities and Career Pathways

P&Os work in privately owned facilities, hospitals, and rehabilitation facilities. Some may pursue a career in academics and may also participate in research to modify the design, fit, and function of orthopaedic or prosthetic devices.

P&Os are also part of a multidisciplinary team treating patients. P&O students and staff are part of joint treatment clinics catering to amputees, diabetics, and patients of cerebral palsy, where they

regularly interact with professionals from Physical Medicine and Rehabilitation, Physical Therapy, Occupational Therapy, endocrine specialists, vascular surgeons, diabetic nurses and orthopaedicians.

Job Description

- Examine, interview, and measure patients to determine their appliance needs and identify factors that could affect appliance fit.
- Fit, test, and evaluate devices on patients, and make adjustments for proper fit, function, and comfort.
- Instruct patients in the use and care of orthotics and prostheses.
- Design orthopaedic and prosthetic devices, based on physicians' prescriptions, and examination and measurement of patients.
- Maintain patients' records.
- Make and modify plaster casts of areas that will be fitted with prostheses or orthotics for use in the device construction process.
- Select the materials and components to be used, based on device design.
- Confer with physicians to formulate specifications and prescriptions for orthopaedic or prosthetic devices.
- Repair, rebuild, and modify prosthetic and orthopaedic appliances.
- Construct and fabricate appliances or supervise others constructing appliances.

33. Physical Therapist

In India, physiotherapy started in the 1950s. It is one of the oldest methods to cure physical ailments, and has evolved into a conglomeration of complex therapies with multiple and specialized applications. Physiotherapy is a health profession which is concerned with maximization of mobility and quality of life by using clinical methods.

Nature of Work

Physical therapists are also referred to as physiotherapists or PTs. They are healthcare professionals who treat patients with movement disorders or functional impairments due to health-related problems, congenital defects, illnesses or injuries such as arthritis, low back pain, fractures, head injury, cerebral palsy, and paraplegia.

They are responsible for planning treatment techniques to enhance movement, reduce pain, restore normal function, and prevent disability in case of a degenerative disorder, arthritis, neurological disorders, or conditions associated with differently abled individuals. They work with individuals to prevent loss of mobility through exercise regimes and lifestyle modifications.

Qualifications, Skills and Knowledge

A Master's degree is the entry-level degree for employment in the USA whereas in India the entry level is a Bachelor's degree programme of four years, followed by six months of internship. Diploma degree holders are usually employed as aides to physical therapists.

Employment Opportunities and Career Pathways

PTs have ample job prospects in hospitals, nursing homes, residential homes, rehabilitation centres, private practices or private clinics. Additionally, a PT can work at outpatient clinics, community healthcare centres or primary healthcare centres, fitness centres or health clubs, occupational health centres, special schools, and senior citizen centres. There are also job prospects in sports centres, with sport teams, academics, companies in foreign countries, NGOs, etc.

PTs have better scope internationally than in India as the market for them is better in developed countries where physiotherapy is accepted as an effective method to address various health conditions.

Job Description

- Conduct and document examination of the patient, evaluate data to identify problems, and arrive at a diagnosis prior to intervention
- Plan, prepare, or carry out individually designed programmes of physical treatment to maintain, improve, or restore physical functioning, alleviate pain, or prevent physical dysfunction in patients
- Record prognosis, treatment, response, and progress in the patient's chart or enter the information in a computer

- Identify and document goals, anticipated progress, and plans for re-evaluation
- Administer manual exercises, massage, or traction to help relieve pain, increase patient strength, or decrease or prevent deformity or crippling
- Evaluate the effects of treatment at various stages and adjust treatment to achieve maximum benefit
- Test and measure the patient's strength, motor development and function, sensory perception, functional capacity, or respiratory or circulatory efficiency, and record data
- Instruct the patient and family in treatment procedures to be continued at home
- Confer with the patient, medical practitioners, or appropriate others to plan, implement, or assess the intervention programme
- Review the physician's referral and patient's medical records to help determine the diagnosis and physical therapy required

34. Speech–Language Pathologist

The first Audiology and Speech Language Therapy programme was started in 1966 at the TN Medical College and BYL Nair Ch. Hospital in Mumbai. In the same year, the Government of India established the All India Institute of Speech and Hearing, which became the country's leading institute in the field of communication disorders.

Currently, there are about 20 institutions (eight governmental and 14 private) in India conducting Speech Pathology and Audiology programmes across the country. These programmes are accredited by the Rehabilitation Council of India (RCI). The majority of these institutes provide excellent multidisciplinary clinical treatment for persons with communication disorders.

Nature of Work

Speech–language pathologists work with people who have speech-related disorders. They are responsible for assessing, diagnosing, treating, and helping patients to alleviate disorders associated with speech, language, voice, swallowing, cognitive communication, and fluency.

Speech–language pathologists develop an individualized plan of care, tailored as per the needs of the patient. They may select augmentative or alternative communication methods, including automated devices and sign language, and teach their use to patients with little or no speech capability. They use special instruments such as adaptive communication switches for the physically challenged, audiometers, flow sensors, laryngo graph speech mirror, to name a few; besides quantitative and qualitative assessment methods.

They also teach patients how to communicate effectively by sound modulations, improving intonations, or by increasing their oral or written language skills. They teach individuals how to strengthen muscles to swallow without choking.

Qualifications, Skills and Knowledge

A Master's degree is the most common level of education among speech–language pathologists in India. The minimum requirement for admission in this professional course is the same as for a medical degree programme. There are ten institutions across the nation, offering BSc/MSc programmes in Audiology and Speech Pathology, and four recognized for PhD programmes.

However, this is a highly specialised and still a nascent field (in India) and information on career paths is not available.

Employment Opportunities and Career Pathways

In India, the career pathway is not clearly defined. According to the Indian Speech and Hearing Association, most audiologists, speech pathologists, teachers for the hearing impaired and clinical psychologists have worked for the handicapped and for orthotists. A large number of speech therapists/speech–language pathologists are found to be employed as clinicians by community care centres.

Some find jobs in universities and government agencies as teachers, or as administrators of speech and hearing programmes. Speech pathologists often work in school settings. Speech pathologists are required to register with the Rehabilitation Council of India (RCI) in order to practise their specialty (clinical/academics) or work with the handicapped.

Job Description

- Evaluate hearing or speech and language test results, barium swallow results, or medical or background information to diagnose and plan treatment for speech, language, fluency, voice, or swallowing disorders
- Develop an individualized plan of care tailored to each patient's needs
- Help patients who have suffered loss of speech to develop, or recover, reliable communication skills so that they can carry on with their lives and activities
- Monitor patients' progress and adjust treatments accordingly
- Administer hearing or speech and language evaluations, tests, or examinations to patients to collect information on the type and degree of impairment, using written or oral tests or special instruments
- Write reports and maintain proper documentation of information, such as client Medicaid or billing records, or caseload activities, including the initial evaluation, treatment, progress, and discharge of clients
- Develop or implement treatment plans for problems such as stuttering, delayed language, swallowing disorders, or inappropriate pitch or harsh voice, based on own assessment and recommendations of physicians, psychologists, or social workers
- Develop individual or group activities or programmes in schools to deal with behaviour, speech, language, or swallowing problems
- Participate in and write reports for meetings regarding patients' progress, such as individualized educational planning (IEP) meetings, in-service meetings, or intervention assistance team meetings
- Complete administrative responsibilities, such as coordinating paperwork, scheduling case management activities, or writing lesson plans
- Instruct clients in techniques for more effective communication, such as sign language, lip reading, or voice improvement
- Educate patients and family members about various topics, such as communication techniques or strategies to cope with, or avoid, personal misunderstandings



JOB ROLES IN THE COMMUNITY-RELATED SERVICES SUB-SECTOR

Job Roles in the Community-Related Services Sector

35. Accredited Social Health Worker

Nature of Work

Accredited Social Health Workers (ASHAs) are voluntary health workers engaged at village level in implementation and support of National health programmes.

Qualifications, Skills and Knowledge

Individuals should have a minimum education till Class VIII to qualify for the role of ASHA. However, in areas where there is a scarcity of such qualified persons, ASHAs may have a lower education also.

They are provided with training consisting of 6 modules over the course of a year to equip them for the functions of an ASHA.

Employment Opportunities and Career Pathways

ASHAs are volunteers working at village level with rural health and family welfare institutions such as Anganwadis, Primary Health centres and others. They are deemed to be a part of the National Rural Health Mission.

Table 21: Career path – ASHA

Sector	Allied Health and Paramedics
Sub-sector	Community Related Services
Occupation	Social Health Worker
Leadership level	ASHA Facilitator/ Supervisor
Middle Management level	Master Trainer - ASHA
Entry Level	ASHA

**Note: Career growth across the Middle Management and Leadership Level is usually governed by an individual's experience and ability. While a possible movement has been indicated, this is usually highly 'person specific' and should not be generalized. Lateral shifts to other sectors/ industries may be possible at different stages in the career progression and usually require further education.*

Job Description

ASHAs provide support to Allied health workers engaged in National health programmes, act as health counsellors to local communities and provide healthcare in the form of essential supplies and referrals. They also:

- Assist the Village Health and Sanitation Committee in developing a village health plan

- Counsel women on contraception and prevention of common infections and Reproductive Tract Infection (RTI) / Sexually Transmitted Infection (STI)
- Counsel adolescents on adolescent health issues
- Counsel women on nutritional and health needs of young children
- Provide antenatal Counselling
- Provide postnatal Counselling
- Counsel women on new-born care and immunisation
- Counsel women on childlessness and abortion related issues
- Provide primary care and counselling for infectious diseases
- Provide primary medical care for minor ailments and first aid for minor injuries
- Undertake timely referrals and escort patients to a hospital where required
- Provide information on primary curative properties of common AYUSH medicines
- Promote construction of household toilets under Total Sanitation Campaign
- Make home visits
- Support the Anganwadi Worker
- Support the Auxiliary Nurse Midwife
- Support the Traditional Birth Attendant
- Support the Male Swasthya Karmi
- Maintain records and registration
- Inform Primary Health Centre of disease outbreaks
- Collate and communicate health information
- Ensure availability of medical and diagnostic supplies

36. Diabetes Educator

Nature of Work

Diabetes educators play an important role in the promotion, maintenance and improvement of the health of individuals with diabetes, by helping patients adopt healthy behaviours.

Qualifications, Skills and Knowledge

Entry-level Diabetes educator positions generally require a minimum of a Bachelor's degree in health or life sciences. Certificate courses providing training for diabetes educators are offered by various institutes or hospitals thereafter. In some cases nutritionists or dieticians undergo training as Diabetes educators to further their skill-sets.

Employment Opportunities and Career Pathways

Diabetes educators are typically employed in hospitals and clinics. They may also work as Dieticians or Nutritionists in conjunction with their role as a Diabetes Educator.

This is still a very nascent field in India and career path information is limited.

Job Description

Diabetes educators work to encourage healthy lifestyles through educating diabetic individuals and about behaviours that are beneficial for them. They attempt to prevent illness by informing and educating individuals and communities about proper nutrition, usage of insulin, the importance of exercise and the habits and behaviours necessary to control their blood sugar.

They also:

- Assess the patient's lifestyle, nutrition and habits
- Set and plan goals for diabetic/pre-diabetic patients
- Implement and evaluate the treatment plan
- Document the patient record and follow-up activities

37. Health Educator

Nature of Work

Health educators play an important role in the promotion, maintenance and improvement of the health of individuals and the community, by helping people and communities adopt healthy behaviours. Health educators work to encourage healthy lifestyles and wellness through educating individuals and communities about behaviours that can prevent disease, injury, and other health problems. They attempt to prevent illness by informing and educating individuals and communities about health-related topics, such as proper nutrition, the importance of exercise, how to avoid sexually transmitted diseases, and the habits and behaviours necessary to avoid illness.

Job Qualification

Entry-level health educator positions generally require a minimum of a Bachelor's degree in health education. These programmes teach students the theories of health education and develop the skills necessary to implement health education programmes.

A Master's degree is required for most health educator positions in public health. A graduate degree is usually required. Once hired, on-the-job training for health educators varies greatly, depending on the type and size of the employer.

However, despite their high level of academic achievement and professional training, health educators in India are not awarded recognition as medical specialists and have little opportunity for promotion or growth in their field. Some health educators pursue a doctoral degree in health education and may transfer to research positions or become professors of health education.

Employment Opportunities and Career Pathways

Health educators are typically employed in rural health and family welfare centres, district medical offices, medical colleges, rural health centres, urban health centres, hospitals, State Health and Education Bureaus, and public health institutions.

In schools and colleges they teach a health class. They develop lesson plans that are relevant and age appropriate for their students. Educators may need to cover sensitive topics, such as sexually transmitted diseases or alcohol and drug abuse, and may also teach another subject concurrently, such as science or physical education.

Health educators in public health are employed primarily by state and local departments of public health and administer state-mandated programmes, especially in rural areas. They work closely with public health centres and hospitals in this capacity.

In Health education bureaus and other health institutions they develop educational materials for use by other public health officials. They work closely with non-profit organizations.

Job Description

Health educators collect and analyse data to identify community needs before planning, implementing, monitoring, and evaluating programmes designed to encourage healthy lifestyles, policies, and environments. They begin by assessing the needs of their audience, which includes determining the appropriate topics to cover. They may hold programmes on self-examination for breast cancer for women or take classes on the effects of binge drinking for college students. Health educators must take the cultural norms of their audience into account. For example, programmes targeted at the elderly need to be different from those aimed at a college-age population.

Within medical care facilities, health educators tend to work one-on-one with patients and their families. In this setting, a health educator's goal is to educate individual patients on their diagnosis and how that may change or affect their lifestyle. To this end, they may explain the necessary procedures or surgeries, as well as how patients will need to alter their lifestyles to manage their illness or return to full health. They may also direct patients to outside resources, such as support groups, home health agencies, or social services.

38. Sanitary Inspector

Nature of Work

A sanitary inspector's job entails carrying out surveys, field work, and research on various aspects related to health and environmental conditions. The core job of the professional remains to supervise an assignment, conduct analysis when the need arises, and make the people/company abide by the health standards. Most opportunities for work exist in the government sector.

Qualifications, Skills and Knowledge

A candidate aspiring for this profession must have either a diploma or have completed a certificate course for sanitary inspectors.

Employment Opportunities and Career Pathways

An individual who has completed a sanitary inspector's course can get recruited in the health departments of the State and Central Governments such as Municipal Corporations, Nagar Palikas, Railways, Hospitals, Cantonment Area, Government Institutes, Oil Refineries, and Factories etc.

In the private organizations they work with Hospitals, Hotel, Metal Industry, Chemical Industry, Textile Industry, Food Industry, Travel and Entertainment Industry, Electrical Industry etc. They can work as chief managers, supervisors, and health inspection consultants. With time and experience, they can get supervisory and managerial jobs offering higher pay.

Job Description

- Sanitation of the area assigned
- Supervise and guide sanitary workers in their work
- Conducting health and general surveys in different areas and preparation of reports
- Organizing immunization services
- Ensuring disinfection of hospital wards, operation theatres, labour rooms
- Participating in various health and sanitation programmes
- Conducting programmes on personal hygiene in different areas
- Arranging first-aid treatment in case of an emergency

Annexure 1: List of Persons Consulted

S.No.	Name	Designation	Name of Institution
1.	Dr. Atamjot Grewal	Medical Head – Projects & Consultancy	Fortis Healthcare
2.	Deepti Khatiya	Senior Clinical Nutritionist	Fortis Healthcare
3.	Shilpa Sharma	Clinical Nutritionist	Fortis Healthcare
4.	Vishal Kaul	Manager	Fortis Healthcare
5.	Rajiv Sharma	Manager	Fortis Healthcare
6.	Dr. Talat Halim	Chief of Emergency Service	Fortis Healthcare
7.	Jophy	Nurse	Fortis Healthcare
8.	Praful	Nurse	Fortis Healthcare
9.	Basil	Nurse	Fortis Healthcare
10.	Ajitha PS	Chief of Nursing	Fortis Healthcare
11.	Manju Sebastian	Nursing Supervisor	Fortis Healthcare
12.	Pawan Kumar	GDA Supervisor	Fortis Healthcare

S.No.	Name	Designation	Name of Institution
13.	Jojo Sebastian	Floor In-charge	Fortis Healthcare
14.	Rakesh Kumar Gautam	Technician	Fortis Healthcare
15.	Suresh Kumar	Team Leader	Fortis Healthcare
16.	Shashi Bhushan Mishra	Senior Supervisor	Fortis Healthcare
17.	Deepak Singh	Senior Supervisor	Fortis Healthcare
18.	Pankaj	Senior Technician	Fortis Healthcare
19.	Dhiraj Sharma	Team Leader	Fortis Healthcare
20.	Dr. Sunila Sharma	Additional Director, Anaesthesiology	Fortis Healthcare
21.	Dr. Rahul Grover	Consultant, Nephrology	Fortis Healthcare
22.	Nadeem Ahmed	Executive	Fortis Healthcare
23.	Rahul Chaturvedi	Supervisor	Fortis Healthcare
24.	Rakesh Kumar Gupta	Radiology	Fortis Healthcare
25.	Sangeeta Aggarwal	Transfusion Medicine	Fortis Healthcare
26.	Dr. Tomas Madayag	Consultant	Vidyanta

S.No.	Name	Designation	Name of Institution
27.	Naveen Trehan	Chairman & Co-CEO	Vidyanta
28.	Jonathan Lance	Co-Chief Executive Officer	Vidyanta
29.	Nakul Verma	General Manger - Policy	GE Medical
30.	Milind Palsule	Director Service – South Asia	GE Medical
31.	Sanjay Sarin	Regional Director - Global Health / Central & South Asia Pacific	Becton Dickinson
32.	Dr. Alexander Thomas	CEO, Bangalore Baptist Hospital	ANBAI
33.	Dr. Sindhulina	Head of training	ANBAI
34.	Dr. Malathi A	Head Medical Services Compliance & Education	Manipal Hospitals
35.	Dr Rakesh Verma	Corporate Training Lead	Narayana Hrudayalaya Health City
36.	Rakesh Sharma	Head - Strategy, M&A & New Business Development	Philips
37.	Sudhakar Mairpadi	Director-Quality & Regulatory	Philips
38.	Manish Jain	Director - Health Policy	Johnson & Johnson
39.	Dr.Prabhakar	CEO – Incharge	Apollo Medskills

S.No.	Name	Designation	Name of Institution
40.	Dr. Raman Sardana	Director Medical Services	Apollo
41.	Dr. Ranu Khan		Apollo
42.	Dr. Paramhans Mishra	Medical Superintendent	Indian Spinal Injury Hospital
43.	Dr. Siddharth Satyapathy	Professor, Hospital Administrator	AIIMS
44.	Dr. Nishit Mittal	Resident Administrator	AIIMS
45.	Dr. Manisha K.P.	Resident Administrator	AIIMS
46.	Dr. P. Kumar	Senior Resident	AIIMS
47.	Dr. Shweta	Senior Resident	AIIMS
48.	Dr. Vijaydeeg Siddhant	Senior Resident	AIIMS
49.	Dr. Amit Lothwal	Assistant Professor	AIIMS
50.	Dr. IB Singh	Assistant Professor	AIIMS
51.	Dr. Arti Vij	Assistant Professor	AIIMS
52.	Dr. Anky Reddy	Resident	AIIMS
53.	Dr. Nirupam Madan		AIIMS

S.No.	Name	Designation	Name of Institution
54.	Dr. Mahesh R.		AIIMS
55.	Dr. Sanjay Arya	Additional Professor	AIIMS
56.	Dr. Jitender Mehta	Senior Resident	AIIMS
57.	Dr. Sheetal Singh	Resident	AIIMS
58.	Dr. AR Singh	Senior Resident	AIIMS
59.	Richa Jaswal	Assistant Dietician	AIIMS
60.	Dr. Neeraj Bishnoi	GM - Operations	Paras
61.	Anita Gupta	Nursing Superintendent	Paras
62.	Vishal Sharma	Deputy Medical Superintendent	Paras
63.	Rohini Lowe	Manager Housekeeping	Paras
64.	Vinod Singh	Manager Operations	Paras
65.	Swadesh Kumar	Assistant Medical Superintendent	Paras
66.	Monica Rana	Manager Quality	Paras
67.	Eti Bhalla	HOD; CN&D	Paras

S.No.	Name	Designation	Name of Institution
68.	Ravindar Bhamla	Assistant Manager Billing	Paras
69.	Usha Banerjee	Director of Nursing	Apollo
70.	Dr. V.L. Sateesh	Medical Superintendent	NIMHANS
71.	Dr. Paresh Navalkar	Head of the Organization	Lifesupport Institute of Health Science
72.	Dr.Tamorish	Head, Department of Emergency	Max
73.	Dr.Vijay Reddy	Medical Education - Project Manager	Max
74.	Vikas Kohli	Vice President - Operations	VIVO Healthcare
75.	Elizabeth G Clark	Consultant	KIMS
76.	Dr. Praneet Kumar	CEO	B.L.Kapoor Hospital
77.	Dr. Mradul Kaushik	Head – Medical Services	B.L.Kapoor Hospital
78.	Dr. Sanjay Mehta	Medical Superintendent	B.L.Kapoor Hospital
79.	Dr. Sonali Dighe		Pfizer
80.	Dr Suman Raina	Dental Department	Sitaram Bhartia Institute of science and research
81.	Dr Prem Nair		Amrita Institute of Medical Sciences and Research Centre

S.No.	Name	Designation	Name of Institution
82.	Ms. Manimala		Baroda Heart Institute and Research Centre
83.	Dr Paul Ravindran		Christian Medical College, Vellore
84.	Ms. Jyoti Ahuja		Gujarat Medical Education and Research Society
85.	Dr Ananthanarayanan		JIPMER, Puducherry
86.	Dr. Rajashekhar		Kasturba Hospital, Manipal
87.	Dr. Thukral		Safdarjung Hospital, New Delhi
88.	Mr. Bhupendra Patel		Shalby Hospital
89.	Mr. Bir Singh		Sterling Hospital - Ahmedabad
90.	Dr. Shivani Jayaswal		Sterling Hospital - Bhavnagar
91.	Dr. Maria M. Borges	Chief Quality Officer	SRL
92.	Shilpa Prabhudesai	Consultant Pathologist and Laboratory Director	Triesta Reference Laboratory, HealthCare Global, Bangalore
93.	Mukesh Agarwal	Lab Director	Vimta
94.	Sandhya Phadke	Lab Director	Erlich Laboratories
95.	Bhaskar Bhattacharya	Lab Director	Suraksha Diagnostics

S.No.	Name	Designation	Name of Institution
96.	Paraminder Kaur	Quality Head	Dr. Lal Path Labs
97.	Dr. Minnie	Lab Director	Cyrobanks & Diagno
98.	Dr. Ashavaid	Lab Director	Hinduja Hospital
99.	Dr. Barnali Das	Consultant, Biochemistry & Immunology Division	Kokilaben Dhirubhai Ambani hospital & medical research institute
100.	Dr. Anita Singh	M.D (Pathology) Clinical Manager	BD Diagnostics
101.	Jayashri	Lab Director	Dr. Mohans
102.	Nisha Sana Ahmad	Lab Director	Metropolis Mumbai
103.	Chirantan Bose	Director - Lab Operations	Ampath
104.	Caesar Sengupta	Lab Director	Thyrocare

List of Abbreviations

Abbreviation	Description
AERB	Atomic Energy Regulatory Board
AHP	Allied Health Professional
AIIMS	All India Institute of Medical Sciences
AIMLTA	All India Medical Laboratory Technologists Association
ALS	Advanced Life Support
ASHA	Accredited Social Health Activist
AYUSH	Ayurvedic, Yoga, Unani, Siddha, and Homoeopathy
B.Sc.	Bachelor of Science
BARC	Bhabha Atomic Research Centre
CAT Scan	Computerised Tomography
CEO	Chief Operating Officer
EEG	Electroencephalograph
EMT	Emergency Medical Technician
END	Electro-Neuro Diagnostic
FGD	Focus Group Discussion
GDA	General Duty Assistant
HIV	Human Immunodeficiency Virus
HSSC	Health Sector Skills Council
ICU	Intensive Care Unit
INR	Indian Rupee
MD	Doctor of Medicine
MET	Medical Equipment Technicians
MHRD	Ministry of Human Resource Development
MLT	Medical Laboratory Technician
MRI	Magnetic Resonance Imaging
MRT	Medical Record Technicians
NOS	National Occupational Standard(s)
NSDC	National Skills Development Corporation
NVEQF	National Vocational Education Qualifications Framework
NVQF	National Vocational Qualifications Framework
OS	Occupational Standard(s)
OT	Operating Theatre
PET	Positron Emission Tomography
PhD.	Doctor of Philosophy

Abbreviation	Description
QP	Qualifications Pack
RCI	Rehabilitation Council of India
RMC	Radiation Medicine Centre
RSO	Radiation Safety Officer
SSC	Sector Skills Council
USD	United States Dollar
WHO	World Health Organisation

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