Tertiary teaching hospital

A tertiary teaching hospital is a large, specialized medical facility that provides advanced care, typically including complex surgeries, treatments, and services not commonly available at smaller hospitals. These hospitals are usually affiliated with a medical school or university, which allows them to serve as training centers for medical students, residents, and other healthcare professionals.

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Additionally, tertiary teaching hospitals are often involved in medical research and clinical trials, contributing to the development of new treatments and medical knowledge. Their role is crucial in both providing high-level patient care and advancing the education of future healthcare professionals.

While the terms "teaching hospital" and "university hospital" are often used interchangeably, they can have slightly different meanings depending on the context and region. Generally, both types of hospitals have a strong educational component, but there are some distinctions:

Teaching Hospital:

A teaching hospital is typically a medical facility associated with a medical school or other educational institution. It is actively involved in training medical students, interns, residents, and fellows. These hospitals serve as clinical training sites for healthcare professionals. Teaching hospitals often have a close partnership with nearby medical schools or universities, but they may not necessarily be directly affiliated with a university.

University Hospital:

A university hospital is a medical center that is part of or directly affiliated with a university. University hospitals may also have a strong educational mission and are involved in medical education and research. In some cases, the term "university hospital" is used to emphasize the research and academic aspects of the institution. In practice, many hospitals, especially larger medical centers, can be both teaching hospitals and university hospitals simultaneously. They provide patient care, conduct research, and offer medical education programs in collaboration with affiliated universities or medical schools. These institutions often have a diverse range of healthcare services, specialties, and research programs.

It's worth noting that the terminology can vary by region and country. In some places, the distinction between teaching hospitals and university hospitals may be less pronounced, and the terms may be used more interchangeably. The primary commonality between these types of hospitals is their involvement in medical education and research in addition to providing medical care to patients.

A tertiary referral hospital (also called a tertiary hospital, tertiary referral center, tertiary care center, or tertiary center) is a hospital that provides tertiary care, which is a level of health care obtained from specialists in a large hospital after a referral from the providers of primary care and secondary care

Referral is the transfer of care for a patient from one clinician or clinic to another by request.

Patient referral is a protocol where the referring primary care physician refers the patient to a specialist for further treatment. The paper-based current referral process at times lead to communication and operational issues, resulting in either an unfulfilled referral request or an unnecessary referral request. Despite the availability of standardized referral protocols they are not readily applied because they are tedious and time-consuming, thus resulting in suboptimal referral requests.

Prideaux et al., studied potential delays in epilepsy surgery in children with drug-resistant epilepsy (DRE) of early-onset.

Medical records were reviewed from 87 children with DRE and seizure onset before age 3 years who underwent epilepsy surgery between 2006 and 2015. Information was obtained about each child's epilepsy, treatment and specific time points in management. Time intervals along diagnostic, investigative, treatment and referral pathways were calculated.

Median ages at seizure onset, when seen in the epilepsy surgery program and surgery were 5.9 (IQR 10), 19 (IQR 29) and 36 (IQR 67) months; the median delay from seizure onset to surgery was 30 (IQR 67) months. Most children were promptly diagnosed, treated, investigated and seen by a pediatric neurologist. Focal abnormalities were reported on initial EEGs and MRIs in most children, and DRE developed within a median of 6.3 months from commencement of medication. There were median durations of 6.2 months between seeing a neurologist and being seen in the epilepsy surgery program, and then 6.1 months in determining surgical candidacy. Median durations from potential indications for a surgical evaluation to agreed surgical candidacy were 10 (DRE), 12 (focal MRI) and 17 (focal EEG) months. Children received a median of six antiepileptic drugs prior to surgery. Median interval from agreed surgical candidacy to surgery was only 3 months. There were longer durations from seizure onset to surgery in children needing PET (p = 0.001) and in children with seizure-free periods (p < 0.001), and shorter durations in children with a history of infantile spasms (p = 0.01).

Delays in referral of children for epilepsy surgery are reported. Delays in assessment may be specific to centralized children's hospitals in public health systems ¹⁾.

Maghsoud-Lou et al. present a semantic-web based Referral Knowledge Modeling and Execution Framework to computerize referral protocols, clinical guidelines and assessment tools in order to develop a computerized e-Referral system that offers protocol-based decision support to streamline and standardize the referral process.

They have developed a Spinal Problem E-Referral (SPER) system that computerizes the Spinal Condition Consultation Protocol (SCCP) mandated by the Halifax Infirmary Division of Neurosurgery (Halifax, Canada) for referrals for spine related conditions (such as back pain). The SPER system executes the ontologically modeled SCCP to determine (i) patient's triaging option as per severity assessments stipulated by SCCP; and (b) clinical recommendations as per the clinical guidelines incorporated within SCCP. In operation, the SPER system identifies the critical cases and triages them for specialist referral, whereas for non-critical cases SPER system provides clinical guideline based recommendations to help the primary care physician effectively manage the patient. The SPER system has undergone a pilot usability study and was deemed to be easy to use by physicians with potential to improve the referral process within the Division of Neurosurgery at QEII Health Science Center, Halifax, Canada².

Health care from specialists in a large hospital after referral from primary care and secondary care. Beyond that general definition, there is no precise narrower or more formal definition.

A tertiary referral hospital (also called a tertiary hospital, tertiary referral center, or tertiary care center, or tertiary center) is a hospital that provides tertiary care.

Thousands of neurosurgical emergencies are transferred yearly to tertiary care facilities to assume a higher level of care. Several studies have examined how neurosurgical transfers influence patient outcomes, but characteristics of potentially avoidable transfers have yet to be investigated.

Interhospital transfers to the medical intensive care unit are patients at high risk for mortality and other adverse outcomes. System-level and patient-level characteristics influence both early and overall hospital mortality rates. These variables should be considered when risk stratifying medical intensive care unit patients and in studying outcomes of care ³.

Tertiary centers usually include the following:

A major hospital that usually has a full complement of services including pediatrics, obstetrics, general medicine, gynecology, various branches of surgery and psychiatry or a specialty hospital dedicated to specific sub-specialty care (pediatric centers, Oncology centers, psychiatric hospitals). Patients will often be referred from smaller hospitals to a tertiary hospital for major operations, consultations with sub-specialists and when sophisticated intensive care facilities are required. Some examples of tertiary referral center care are:

Head and neck oncology

Perinatology (high-risk pregnancies)

Neonatology (high-risk newborn care)

PET scans

Organ transplantation

Trauma surgery

High-dose chemotherapy for cancer cases

Growth and puberty disorders

Neurology and neurosurgery

In the UK, cases of poisoning.

Neurological deterioration and mortality are frequent in neurosurgical patients transferred to tertiary centers, but the precise predictors leading to them are unclear.

Hydrocephalus, use of clopidogrel and warfarin, and intracerebral hemorrhage are each independently associated with elevated risk of deterioration and death ⁴⁾.

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Kuhn et al., evaluated 916 neurosurgical patients transferred to a tertiary care facility over a 2-year period. Transfers were classified as potentially avoidable when no neurosurgical diagnostic test, intervention, or intensive monitoring was deemed necessary (n = 180). The remaining transfers were classified as justifiable (n = 736). The main outcomes and measures were age, sex, diagnosis, insurance status, intervention, distance of transfer, length of hospital and intensive care unit stay, mortality, discharge disposition, and cost.

Nearly 20% of transfers were identified as being potentially avoidable. Although some of these patients had suffered devastating, irrecoverable neurological insults, many had innocuous conditions that did not require transfer to a higher level of care. Justifiable transfers tend to involve patients with nontraumatic intracranial hemorrhage and cranial neoplasm. Both groups were admitted to the intensive care unit at the same rate (approximately 70% of patients). Finally, the direct transportation cost of potentially avoidable transfers was \$1.46 million over 2 years.

This study identified the frequency and expense of potentially avoidable transfers. There is a need for closer examination of the clinical and financial implications of potentially avoidable transfers ⁵⁾.

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