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A Brief Report on Enhancing Patient Health Safety through Ontology

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Introduction

Despite significant advancements in the medical field, bladder cancer (BC) remains a major concern for urologists worldwide. The standard age-specific mortality rate for BC is estimated to be 4.7 per 100,000. Due to its frequency, anatomical pathological polymorphism, difficulty in precise staging, and high prognostic uncertainty, it plays a particularly important role in predicting treatment side effects (SEs) in urological carcinology. The prediction, early detection, prevention, and treatment of these diseases' long-term complications should help reduce costs and encourage the growth of new organizations that are typically safer and more effective than traditional practices and offer patients a better quality of life.

Cancer is now the leading cause of death because it is a multifactorial disease. The amount of information and information commitment to the speculations inside this discipline assumes a significant part in the administration of numerous comprehensive pathologies. Since the adoption of evidence-based medicine principles and the deciphering of the human genome, oncotherapy options have expanded significantly. We are now able to predict the patient's health risks, particularly potential future cancers, with ever-increasing accuracy.

Description

By referring to the most recent research in this area, we hope to be able to determine the efficacy of the selected treatment option before it is even prescribed. As a result, we can steer clear of treatments that have been deemed to be less effective, more expensive, and more challenging. Such a proactive way to deal with endorsing is enthusiastically suggested before the beginning of the infection to forestall or postpone it. This breakthrough is part of the major development in oncology known as precision or personalized medicine, which enables the patient to select the appropriate treatment.

Ontology-driven semantic web technologies could be a useful tool for managing BC knowledge, including oncotherapy procedures and the clinical processes that go along with them. They are extensively utilized in a wide range of clinical applications that support computer-based processing and reasoning by formal modelling and conceptualizing of domain knowledge. These features may aid reasoning and the automatic generation of new information. This reasoning serves the primary objective of our work, which is the creation of a decision-making tool to assist oncologists in the treatment prescribing process, particularly in this paper. In this setting, an efficient decision support system (DSS) ought to make it possible to apply BC-related scientific findings to medical cases. In addition to archived cases of patients who have been diagnosed with and treated for this epidemic, this includes domain-specific knowledge, both theoretical and empirical. The ontological evidence-based strategy we present in this work is built on the foundation of the collection of all of this diverse knowledge into a single semantic knowledge-base (KB) [1-5].

We used contextual information, such as interrogation, clinical examination medical tests, and other complementary examinations, to model the patients' medical case and capture the necessary parameters for making the right diagnosis.

This is based on the patient's health and particular cancer knowledge. The stage, grade, risk category, functional index, and other medical conditions affecting the patient as well as the patient's preferences are taken into account when selecting treatments. Surgery, specifically Transurethral Resection of the Bladder Tumor (TURBT), cystectomy, and pelvic lymph node dissection, are some of the most common treatment options for this pathology. Additionally, immunotherapy, chemotherapy, and radiation therapy are frequently used to treat BC. However, these procedures can cause mouth sores, fatigue, changes in kidney or liver function, diarrhoea, dry mouth, changes in fingernails or toenails, changes in the blood's mineral levels, loss of appetite, loss of taste, anemia, dry skin, dry eyes, and hair loss. They can also cause redness, swelling, peeling or tenderness on the hands or feet, constipation, stomach pain, nausea, and muscle pain. Additionally, eye issues may arise. These incorporate obscured vision, loss of vision or other visual changes. In most cases, blood in the urine, irritability, and a burning sensation in the bladder occur. The type and severity of SEs will vary with the patient's medical history and the treatment they receive.

Conclusion

It makes use of ontologies and semantic models to facilitate the management of cancer research results and knowledge. Especially, this was connected with expanding patient wellbeing by assisting the specialist to pick therapy with less SEs thinking about the particular clinical case and segment data. Our findings demonstrated the efficacy of our strategy in predicting risks prior to initiating prescribed treatment, not only to reduce the likelihood of adverse effects but also to improve prescriptions with fewer side effects and to assist in selecting complex therapy approaches. In addition, advancing cancer treatment management requires the creation of automated, evidence-based medical tools. We obtained the necessary medical cases and knowledge through recent domain studies. We were also able to use clinical reasoning about the collected knowledge, which is very similar to the human cognitive processes that oncologists typically use to evaluate the SEs of a particular treatment, thanks to the formal representation of clinical knowledge and evidence. The use of automated reasoning made it possible to connect a lot of evidence, proofs, and contextual information about the patient's medical case, in contrast to the human cognitive process of thinking. Therefore, doctors could be seamlessly assisted in determining the appropriateness and effectiveness of patient treatment by referring to this tool.

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