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Clinical Decision Support Systems to Improve Diagnosis and Treatment of Urinary Tract Infections in Nursing Home Residents: A Review

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Abstract

Urinary Tract Infections (UTIs), which are thought to affect 5–10% of nursing home patients annually, are a prevalent issue. Due to unusual symptoms, concomitant conditions and the possibility of silent bacteriuria, UTIs in this population might be challenging to identify. Healthcare professionals can use Clinical Decision Support (CDS) tools to help in the identification and management of suspected UTIs in nursing home residents. An overview of CDS and its possible application in the detection and treatment of suspected UTIs in nursing home patients will be given in this presentation. Clinical Decision Support (CDS) systems are computer-based technologies that give healthcare professionals immediate access to clinical expertise and patient-specific data to enhance decision-making. From straightforward reminders to sophisticated algorithms that use patient-specific data to produce suggestions for diagnosis, treatment and monitoring, CDS systems can offer a variety of help.

Keywords: Urinary tract infections • Clinical decision support • Bacteriuria

Introduction

By lowering diagnostic mistakes, enhancing adherence to recommendations and boosting efficiency, CDS systems have the potential to enhance the quality of treatment and patient outcomes. Electronic Health Record (EHR) systems can incorporate CDS systems, making them easily accessible to healthcare professionals. As suspected UTIs are widespread in this group, CDS systems in nursing homes can be very helpful in the detection and management of these conditions. CDS algorithms may be based on recommendations made by the Centers for Disease Control and Prevention (CDC) for the detection and treatment of UTIs in nursing care patients.

The possibility of asymptomatic bacteriuria, which is defined as the presence of bacteria in the urine without accompanying symptoms, is a significant obstacle in the detection of UTIs in nursing home patients. Residents of nursing homes frequently have asymptomatic bacteriuria, with rates as high as 50% in some studies. However, it is not advised to treat asymptomatic bacteriuria since it is not linked to unfavorable results and can result in the emergence of bacteria that are resistant to antibiotics. Healthcare professionals can use CDS systems to help them determine if a resident has symptomatic or asymptomatic bacteriuria. In order to produce a suggestion for additional diagnostic tests or therapy, algorithms can take into account patient-specific information including age, sex, comorbidities and medication usage.

Literature Review

The detection and management of Urinary Tract Infections (UTIs) in nursing home patients have the potential to be significantly improved by Clinical Decision Support Systems (CDSS). Clinical recommendations and alerts are sent in real-time to healthcare providers *via* the CDSS, a system that makes use of patient data and evidence-based suggestions. The following advantages of CDSS can be shown in relation to UTIs in nursing home residents [1].

Enhanced UTI diagnosis accuracy: To aid in the precise diagnosis of UTIs, CDSS may examine patient data, including symptoms, vital signs, test results and medical history. CDSS can offer healthcare practitioners insightful information and lessen the possibility of incorrect diagnoses or unnecessarily administering antibiotics by taking into account a number of variables and comparing them to established recommendations [2,3].

Timely interventions and treatment suggestions: When certain UTI-related indications or thresholds are reached, CDSS may rapidly inform healthcare practitioners. This can aid in early detection of suspected UTI infections and rapid implementation of the necessary therapies. On the basis of the resident's medical history, known sensitivities and local antibiotic resistance trends, the system can offer suitable laboratory tests, such as urinalysis or urine culture and provide targeted treatment alternatives.

Reducing antibiotic abuse and resistance: Residents of nursing homes frequently have their UTIs overdiagnosed, which results in the overuse of antibiotics. In order to identify between genuine UTI infections and other illnesses that could present with similar symptoms, CDSS can help medical professionals. CDSS can reduce the growth of antibiotic resistance and related consequences among nursing home patients by encouraging more prudent use of antibiotics.

Improved adherence to evidence-based recommendations: CDSS may be configured to follow recommendations for diagnosing and treating UTIs. This reduces practice variability and promotes uniform, high-quality treatment across nursing home facilities by ensuring that healthcare practitioners have access to the most recent guidelines. Additionally, CDSS can offer references and instructional materials to assist healthcare professionals in their decision-making [4-6].

Discussion

Follow-up and continuing monitoring: CDSS can help with continued follow-up and monitoring of UTI cases in nursing home patients. The system

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can monitor how well a patient responds to therapy, spot situations that need further in-depth analysis and send out warnings about probable problems or reoccurring infections. By doing so, the patient's UTI management may be optimized and the right steps are performed at each stage.

In conclusion, the use of CDSS in nursing homes can considerably enhance resident UTI diagnosis and care. CDSS can improve diagnosis accuracy, enable prompt treatments, decrease antibiotic abuse, encourage adherence to guidelines and support continuous monitoring by utilizing patient data and evidence-based guidelines. These developments help nursing home patients with UTIs receive better care and are generally in better health.

The unique presentation of symptoms in nursing home patients presents another difficulty in making a diagnosis of UTIs. It's possible that older people don't have the typical UTI symptoms of urgency, frequency and dysuria. Instead, they could exhibit vague symptoms including incontinence, falls and bewilderment. This may result in this population's UTIs being underdiagnosed and undertreated. Healthcare professionals can use CDS systems to identify unusual UTI symptoms and produce recommendations for additional diagnostic tests or therapy. In order to produce suggestions for additional testing, algorithms can take into account patient-specific information including cognitive function, mobility status and continence status.

Conclusion

Potentially better patient outcomes and lower healthcare costs might result from the use of CDS systems in the identification and treatment of suspected UTIs in nursing home patients. CDS systems can lower diagnostic mistakes, increase adherence to evidence-based recommendations and decrease the overuse of antibiotics. Additionally, CDS systems can shorten the time between diagnosis and treatment by increasing the effectiveness of the diagnostic and therapeutic process. The availability of EHR systems might provide a problem for the introduction of CDS systems in nursing homes. EHR systems are not installed in every nursing facility and those that are may have various systems with differing degrees of usefulness.

Acknowledgement

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Conflict of Interest

No conflict of interest.

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