**PreDM CDS Tool Description and Design Proposal for Screening Diabetes Mellitus**

Group- 1

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**Introduction**

Diabetes affects 30 million Americans (9.4% of the population), and 84 million have prediabetes, posing a risk of progression (Centers for Disease Control and Prevention, 2023). Screening for diabetes, a global health concern, is vital for early diagnosis and intervention. Diabetes Mellitus encompasses Type 1, Type 2, and Gestational diabetes (Vasavada & Taub, 2020). The PreDM CDS tool, integrated with the GE Centricity EHR system, aims to promote evidence-based prediabetes care and screening in primary care settings (O’Brien et al., 2022). This tool displays relevant patient data, and enables providers to document prediabetes diagnosis, order tests, prescribe metformin, and refer patients for lifestyle counseling – all from a single location within the EHR. By streamlining prediabetes screening and management workflows, the PreDM CDS tool can potentially improve guideline compliance and increase the identification of high-risk individuals, supporting timely preventive interventions to curb the diabetes epidemic.

**Aim of the CDS system**

The PreDM CDS aims to promote evidence-based care for prediabetes in primary care settings by providing decision support to healthcare providers (O’Brien et al., 2022).

**Description of the CDS system**

The PreDM CDS is an electronic health record (EHR) integrated tool that automatically appears during patient visits for those identified as having prediabetes based on diagnosis codes or lab values (O’Brien et al., 2022). It displays the patient's recent weight, BMI, HbA1c, glucose, and creatinine values. Providers can then use the tool to order HbA1c tests, prescribe metformin, refer patients for lifestyle counseling with a health educator, and add a prediabetes diagnosis code.

**Inclusion/exclusion criteria or specific parameters**

The PreDM CDS appears for adult patients aged ≥18 years with prediabetes, defined by diagnosis codes or lab values in the prediabetic range (HbA1c 5.7-6.4% or fasting glucose 100-125 mg/dL) (O’Brien et al., 2022). It excludes patients with diabetes, active pregnancy, or elevated creatinine levels that could preclude metformin use.

**Which healthcare providers the CDS system assists**

The PreDM CDS is designed to assist primary care providers, including physicians, nurse practitioners, and others involved in managing prediabetes in the outpatient setting.

**Knowledge base guiding the CDS system**

The PreDM CDS is guided by evidence-based guidelines and literature on prediabetes management, such as recommendations from the Diabetes Prevention Program trial on intensive lifestyle interventions and metformin use for preventing type 2 diabetes in those with prediabetes.

**Evaluation of the PreDM CDS system**

**Benefits of the CDS system:**

The PreDM CDS tool is an evidence-based, EHR-integrated solution that streamlines prediabetes screening and management workflows in primary care settings. Grounded in clinical trial evidence, it promotes proven interventions like lifestyle counseling and metformin prescription. Seamlessly embedded within the EHR system, it can automatically identify eligible patients and present relevant data and recommendations to providers during encounters (O’Brien et al., 2022). The tool consolidates multiple prediabetes care actions into a single location, streamlining the workflow. Its design incorporates provider feedback, tailoring it to their preferences. Ultimately, by prompting evidence-based preventive interventions, the PreDM CDS aims to increase the provision of guideline-concordant prediabetes care, a condition often under-addressed, thereby supporting efforts to curb the diabetes epidemic.

**Potential flaws of the CDS system:**

Despite its evidence-based design and EHR integration, the PreDM CDS tool faced several challenges in implementation and effectiveness. Its utilization rate was low at 1.5% of eligible patients, indicating difficulties in engaging healthcare providers and integrating it into routine clinical practices. The absence of an interruptive alert system might have contributed to its low usage, failing to capture clinicians' attention effectively. While the tool improved certain process outcomes, it demonstrated limited clinical impact, with only small, nonsignificant weight loss observed in exploratory analyses. The study acknowledged feasibility challenges related to low use, highlighting the need for further refinement to enhance the tool's effectiveness in primary care settings and achieve significant clinical outcomes in prediabetes management.

**Here are three suggestions to improve upon the existing PreDM CDS system:**

To improve the PreDM CDS tool's adoption and effectiveness, implementing an interruptive alert system balanced against alert fatigue could increase visibility during eligible encounters. Integrating decision support for identifying and enrolling patients in intensive lifestyle intervention programs based on location and insurance could enhance diabetes prevention efforts. Regularly updating the knowledge base with the latest research and clinical guidelines through literature reviews, collaborations, and automated processes would ensure the tool's long-term relevance and evidence-based nature in prediabetes management.

**Here is a description of the proposed CDS design in terms of Who/What/Where/When/How:**

**a) Where:** The CDS system will be integrated into the electronic health record (EHR) system used in outpatient physician offices and primary care clinics.

**b) Who (recipients):** Primary care physicians, Nurse practitioners, Other members of the care team involved in diabetes screening and prevention (e.g., nurses, medical assistants, health educators)

**c) How (delivery channel):** The CDS will be embedded within the EHR system, specifically within the patient chart/encounter module. It may also integrate with the computerized physician order entry (CPOE) module for lab ordering and referral placement.

**d) When (point in workflow):** The CDS will trigger during outpatient visits or encounters for eligible patients meeting the criteria for prediabetes screening or management. After recording vital signs (weight, BMI) to assess prediabetes risk, When reviewing recent lab results (HbA1c, glucose), During the assessment/plan stage of the encounter.

**e) What (user interaction):** The CDS offers interruptive alerts for prediabetes risk factors, providing evidence-based recommendations for tailored patient care. Providers can order screening tests, prescribe metformin, refer patients to lifestyle counseling, or enroll them in ILI programs. They review recommendations, select actions, and auto-populating orders or referrals. The CDS integrates clinical guidelines, supports comprehensive prediabetes management, and offers patient self-monitoring with education and reminders. It continuously updates its knowledge base and may use predictive analytics for high-risk patient identification. Reporting capabilities track prediabetes screening and management metrics at the practice/system level. The design aims for comprehensive, evidence-based decision support, seamlessly integrating into clinical workflows.

**PreDM CDS Intervention Design**

**A diagram of a medical procedure

Description automatically generated**

**Reference:**

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