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THE DIGITAL DIABETES PHARMACIST: A PROPOSED FRAMEWORK FOR DEDICATED CLINICAL PHARMACIST OVERSIGHT IN DIABETES DIGITAL TWIN SYSTEMS

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Abstract

Diabetes affects over 537 million people worldwide, and the system built to manage it is not working. It responds to crises after they occur, treats every patient identically regardless of their individual biology, and places over 180 clinical decisions per day on patients themselves without adequate professional support. It was never designed for precision. It was designed for scale.

Diabetes digital twin technology is beginning to offer something better. A digital twin is a continuously updated, patient-specific computational model that simulates in real time how an individual's liver, kidneys, gut, and insulin system interact, predicting where their glucose is heading four to six hours before it gets there. The output this technology produces is deeply pharmacological in nature. Yet no current care model assigns a clinician with pharmacological expertise to review it continuously.

This paper proposes the Digital Diabetes Pharmacist, a dedicated clinical pharmacist whose primary role is to review digital twin reports for a defined patient cohort daily, act on minor drug interventions independently, co-sign major therapeutic decisions with the physician, and escalate emergencies immediately. Every decision feeds back into the twin, making it progressively more accurate for that specific patient over time.

The physician's engagement with the patient is episodic by nature, which is incompatible with continuous twin oversight. The nurse manages observation and life variables, not drug variables, and existing research has already identified where that falls short. The pharmacist is the only clinician whose training is built around pharmacokinetics, drug interactions, and insulin dynamics, which is precisely the output the twin generates. Implementation barriers and a four-stage research agenda are examined in full. This framework has no precedent in the published literature.

Keywords: Digital twin, Clinical pharmacy practice, Diabetes management