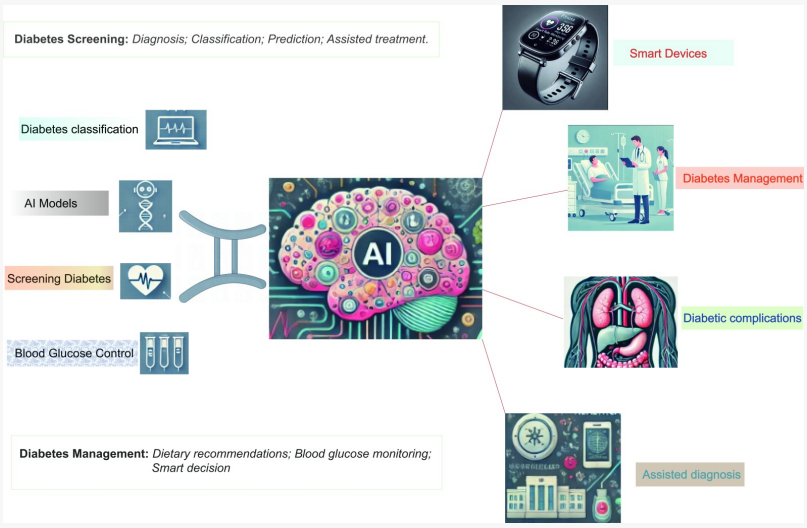
AI for Diabetes Management: Personalized Care and Early Detection.

GA, UNITED STATES, February 27, 2025 /EINPresswire.com/ -- New research highlights AI's role in improving diabetes management through personalized treatment, early complication detection, and dietary guidance. Challenges like data privacy and equitable access remain, but AI offers hope for reducing healthcare costs and enhancing patient outcomes.



OVERVIEW OF AI APPLICATION IN DIABETES MANAGEMENT.

The global incidence and prevalence of diabetes continue to rise, increasing rates of associated disability and mortality while imposing a substantial economic burden. Despite advancements in medical technology, diabetes management faces persistent challenges, including a shortage of specialists, uneven distribution of healthcare resources, and low patient adherence, all contributing to suboptimal glycemic control.

A new review (doi: https://doi.org/10.1016/j.hcr.2024.100006) published in the journal Healthcare and Rehabilitation reveals how artificial intelligence (AI) is brining major changes to diabetes care. By analyzing data from blood sugar levels, medical history, and even retinal scans, AI tools can now predict diabetes subtypes, identify high-risk patients, and tailor solutions to individual needs—improving accuracy, reducing healthcare costs and addressing critical gaps in diagnosis, treatment, and daily management.

“AI isn’t just a tool; it’s a partner in care,” explains the principal investigator of the study Dr. Ling Gao at the Central Laboratory at Shandong Provincial Hospital. “For example, AI can detect early signs of eye damage from diabetes in retinal images as accurately as specialists, which is critical for preventing blindness.”

The research highlights several breakthroughs:

- Early Complication Detection: AI predicts risks like kidney disease and heart issues by spotting patterns humans might miss.

- Personalized Treatment: Smart systems adjust insulin doses in real time, cutting dangerous blood sugar swings.

- Diet and Exercise Guidance: Apps analyze meals via photos and suggest recipes, while AI coaches recommend workouts based on location and health data.

Notably, AI even outperformed traditional methods in some areas. “For instance, CT scans analyzed by AI could screen for osteoporosis in diabetes patients as effectively as specialized bone density tests,” adds Gao. “Wearable devices like smart glucose monitors and socks that detect foot infections further showcase AI’s potential to keep patients healthy at home.”

However, challenges remain. “AI models need diverse data to avoid biases,” emphasizes senior author Dr. Zhongming Wu, a professor in basic and translational studies of endocrine and metabolic diseases, at Affiliated Hospital of Endocrinology and Metabolism, Shandong First Medical University. “A tool trained based on just one population might fail elsewhere.”

Additionally, issues like data privacy and the “black box” nature of some AI decisions require careful handling.

The study calls for stronger collaboration between tech developers, doctors, and policymakers to ensure AI tools are safe, fair, and accessible. “AI is a powerful ally in diabetes care, but human oversight remains essential,” notes Gao. “While AI won’t replace human clinicians, it empowers them to make faster, smarter decisions—ultimately transforming diabetes from a one-size-fits-all disease into a condition managed with precision and foresight.”

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