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Hospital Universitari Sant Joan d'Alacant, Spain

Pictured from Left to right: Beatriz Massa, Emilio Flores, Maite López-Garrigós, María Salinas, Francisco J. Pomares-Gómez

Early Diagnosis and Improved Management of Patients with Diabetes through Strategic and Automated Test Algorithms via Primary Care

Diabetes is one of the leading causes of morbidity and mortality worldwide. Diabetes is also a significant cause of blindness, kidney failure, heart attacks, stroke and amputation. As such, diabetes not only impacts patients directly, but their loved ones, and the health care system as whole.

Fortunately, diabetes can be treated, and its associated complications can be avoided or delayed through diet, physical activity, medication and regular screening and treatment for complications. These opportunities are contingent on the ability to identify and monitor patients appropriately.

Not unlike many chronic diseases, diabetes is often left to primary care physicians (GPs) to identify, treat and monitor. With a growing and aging population, this may be overwhelming to the system and physicians. As the first line of defense against this chronic and debilitating disease, significant opportunities exist to ease this burden, while increasing appropriate screening and monitoring of diabetes for improved health outcomes.

An integrated clinical care team involving laboratory medicine, endocrinology and hospital leadership at Hospital Universitari Sant Joan d'Alacant in Spain identified this need and saw an opportunity to improve patient wellness through strategic and automated testing algorithms in primary care.

The automated algorithm is deployed in two ways. The first method aims to identify unknown/undiagnosed diabetes and prediabetes, whereby Hemoglobin A1c (HbA1c) is strategically and automatically added to all eligible requests from GPs for patients without known DM. The second method aims to enhance monitoring for patients with known diabetes in primary care with a laboratory order for diabetes. HbA1c, cholesterol, (high-density lipoprotein cholesterol (cHDL), low-density lipoprotein cholesterol (cLDL), triglyceride and urinary albumin to creatinine ratio (ACR) values are automatically added to test orders (if not already requested) and had not been requested in the guideline-recommended time period.

This strategic and automated algorithm has enabled the identification of diabetes in one in every 7 patients screened between the ages of 25-45 and one in every 19 patients aged 45-75, for a total of 229 newly identified cases of diabetes and >3000 new cases of prediabetes. Additionally, 14.4% of all known diabetics had improved diabetes monitoring. Consequently, since implementation, the proportion of patients with better controlled diabetes (HbA1c <8%) has significantly increased (3.9% improvement).

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While the costs of additional screening and monitoring are small (<€15.7), the potential mitigated costs are substantial. Compared to the annual costs of treating diabetes and lost labor, the marginal costs of testing and reduced disease burden provide substantial savings opportunities for the patient and health system.

In order to successfully implement a testing algorithm of this magnitude and to ensure buy-in and follow-up occurs, partnership across disciplines is crucial. Although the dedication and investment of many individuals has enabled success, key leaders from Hospital Universitari Sant Joan d'Alacant were recently commended for Healthcare Excellence with a 2020 UNIVANTS of Healthcare Excellence Award.

Leaders associated with the recognition from Hospital Universitari Sant Joan d'Alacant include Maria Saline, *PhD, Head of Laboratory Medicine*, Beatriz Massa, *MD, Chief Executive*, Emilio Flores, *PhD Consultant Laboratory Medicine*, Francisco J Pomares-Gómez, *MD, Endocrinology*, MaiteLópez-Garrigós, *PhD, Consultant Laboratory Medicine*.

THREE KEY TAKEAWAYS

1. Diabetes is a major public health issue and a significant cause of morbidity. Efforts to delay progression and minimize complications are conditional on the ability to identify and appropriately monitor these patients
2. IT-automated algorithms that leverage HbA1c in clinical practice can significantly improve identification of diabetes and prediabetes, as well as ensure guideline-recommended monitoring occurs
3. Cross-divisional involvement helps ensure patients receive appropriate treatment, thus reducing longterm complications and helping to avoid some of the long-term complications with minimal additional costs