1 Title of the idea and proposing services

Type 1 Diabetes Screening at Age 4

Equitable implementation of presymptomatic type 1 diabetes screening in primary health care

Proposing services: Paediatrics Department and Paediatric Endocrinology Unit of ULS Matosinhos, in coordination with the Nutrition Department, primary care medical and nursing teams, Public Health, School Health and research structures.

2 Team

Principal investigator: Filipa Espada, Consultant Paediatrician, Coordinator of the Paediatric Endocrinology Unit (DMCJ), ULSM. **Clinical leads:** Filipa Espada, Patrícia Santos, Ivete Afonso, Laura Almeida. **Nursing team:** Cristina Serrano (Head Nurse, Paediatrics); Sérgio Sousa (Coordinating Nurse, ULSM School Health Programme); Paediatrics nurses Ana Antunes, Ana Ribeiro, Margarida Archer, Samuel Carreira, Sandra Loureiro and Sandra Soares. **Wider team and consortium:** family medicine, paediatric endocrinology, reference laboratory, psychology, nutrition, Public Health, school health, social sciences, biostatistics, health economics, informatics and implementation research; families as partners and an early-career co-investigator; other ULS and eligible international partners, with ULSM as demonstration and training centre. **Partners to mobilise:** Egas Moniz Health Alliance (research), international consortium, contacts with Iberian groups.

3 2027 topics addressed

HORIZON-HLTH-2027-01-DISEASE-10: Prevention and management of chronic non-communicable diseases in children and young people (GACD), including implementation research at ages 1 to 24 (submission-critical points to be resolved before 17/02/2027; target consortium budget EUR 3 to 4 M). **Proposed contributions:** equitable access to early diagnosis; integration and scale-up of the pathway in primary care; support for public funding decisions; engagement of families, community and professionals.

4 Clinical problem or need

For whom: children aged 4 to 5 followed in ULSM primary care. **Scale:** type 1 diabetes (T1D) is the most frequent chronic disease in childhood. **Why now:** T1D can be identified before clinical signs and symptoms; without early diagnosis and follow-up, the first manifestation may be diabetic ketoacidosis (DKA), with avoidable hospitalisation and family distress. The practical need is to turn a project experience into a sustainable programme integrated in primary care. Age 4 uses a scheduled preventive contact before school entry and a circuit already tested at ULSM, linked to the eye screening at this age (feasibility through primary care shown by the Fr1da study). The project therefore evaluates age 4 as a pragmatic, sustainable entry point for universal T1D screening: coverage, equity of access, feasibility, resource needs and continuity of follow-up.

5 Idea

Proposal: presymptomatic T1D screening for all children turning four in participating units, regardless of family history, with accessible information and consent, linked to the child health consultation or the existing eye screening contact to avoid an extra visit; the protocol defines the age window and recovery of non-attenders. The intervention is the full pathway: invitation and informed decision, capillary sample, laboratory confirmation, supported communication, staging, education and follow-up.

Design: pragmatic multicentre study by primary care unit, comparing a basic organised offer with implementation reinforced by training, reminders, multilingual materials and family navigation. **Primary outcome:** proportion of eligible children with valid screening completed in the planned period, also by social vulnerability and access. **Additional outcomes:** team adoption, completed confirmation and referral, time to follow-up, acceptability, psychological impact, costs, sustainability and DKA at progression to stage 3.

Clinical circuit: (1) identify, inform and invite all eligible children, with alternatives to digital consent, interpreting and recovery of non-attenders; (2) collect and analyse: trained capillary sampling, traceability, transport and quality control harmonised with the reference laboratory, with an explicit decision on IAA; (3) confirm before classifying, by an independent method on a new sample, referring multiple persistent autoantibodies for specialist staging; (4) stage and follow: stages 1 to 3, OGTT when indicated, education, intercurrent illness plan and psychological support; (5) communicate and act: limits of a negative result explained, scheduled follow-up for positives, disease-modifying therapies or trials when indicated and accessible. **Equity:** lower-access populations defined in advance (deprivation, language barriers, difficulty attending), reach and completion compared between groups, common clinical core with locally adapted logistics.

Execution: 48 months indicative: co-production with families, protocol and approvals (months 1 to 6); training and initial implementation (7 to 18); expansion and comparative evaluation (19 to 36); follow-up, economic analysis and sustainable integration proposal (37 to 48). **Deliverables:** common operating procedure, trained professionals, pseudonymised database, coverage and equity report, implementation and cost evaluation, laboratory and clinical capacity plan, post-project expansion and funding proposal.

What changes: for children and families, safe diagnosis, understandable information, an accessible team and follow-up before clinical onset; for professionals, a simple procedure, training and guaranteed specialist response; for the system, an evaluated integrated model and the resources needed for national expansion and European adaptation.

6 What already exists

At ULSM: the ULSM-APDP partnership, within EDENT1FI / “Um Dedo Que Adivinha”, brings screening experience in hospital, primary care, school and community settings, from collection to follow-up in Paediatric Endocrinology. Local data for May 2026: more than 5,000 children screened, 20 with at least two autoantibodies and 32 with one. The local circuit uses capillary sampling, ELISA screening for GADA, IA-2A and ZnT8A, confirmation by LIPS or ADAP and a second venous sample; the EDENT1FI protocol provides the European harmonisation base, and the laboratory will validate the final panel, performance, capacity and costs. ULSM is an INNODIA partner. **Outside ULSM:** the Directorate-General of Health (DGS) has started an NHS pilot of T1D screening within the vaccination schedule at age 5, in reference ULS (São João, Coimbra, São José).