Diabetes Technology Maturity Model

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AGENDA

Topic	Time	Detail
Overview	5 min	Rising T1DE Alliance Partnership with T1DX Project Sail
Maturity Models	5 min	Background on Maturity Models Key Problems Today
Diabetes Technology Maturity Model	10 min	What, Why, Who & When Current Iteration
Self-Assessment (via Google Form)	10 min	Acquire Baseline Test Usability Provide Feedback
Discussion / Q&A	5 min	Discussion Q&A

ABOUT

The Rising T1DE Alliance (RTA) is a collaborative network dedicated to advancing diabetes care through data-driven, patient-centered innovation.

By fostering collaboration among healthcare institutions, technology developers, and researchers, RTA is driving the development of scalable solutions that close care gaps, enhance patient outcomes, and shape the future of diabetes management.

- Established in 2016 at Children's Mercy Kansas City with support from The Helmsley Charitable Trust.
- In 2024, Ann & Robert H. Lurie Children's Hospital of Chicago joined the leadership team to expand the reach of RTA's innovative methodologies.

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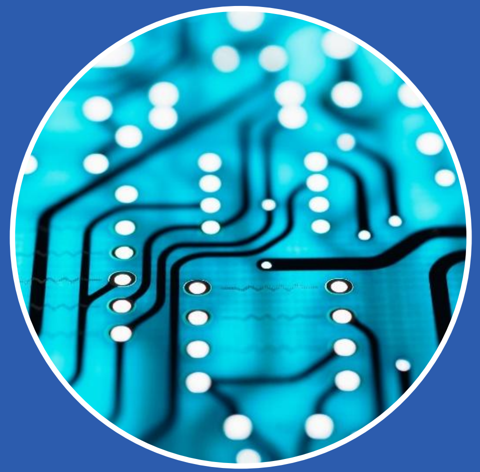
CORE TEAM

RTA Co-Chairs

- Mark Clements (CMKC)
- Juan Espinoza (LCH)

Coordination, Research, and Dissemination Core

- Grace Garcia (Program Manager)
- Lawrence Lett (Project Manager)
- *TBD (Program Coordinator)*
- Dominique Pahud (Strategy Consultant)



Technology, Data, and Analytics Core

- Brent Lockee (Lead Data Scientist)
- Eric Williams (Informatics Lead)

Implementation Core

- Emily Dewit (Lead)
- Sadaf Javaid (Training and Dissemination Specialist)
- Rachel Spencer (Marketing and Communications)

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PROJECT SAIL

Bringing it all together.

1

iCoDE Integration of Continuous Glucose Monitor Data into the Electronic Health Record

2

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3

T1D Exchange

MEETING OBJECTIVES

T1DX - Data Science Committee

Develop a Diabetes Technology Maturity Model

- Outline Purpose & Need
- Self Evaluation: Acquire Baseline Score
- **Test Usability**
- **Provide Feedback**

Background

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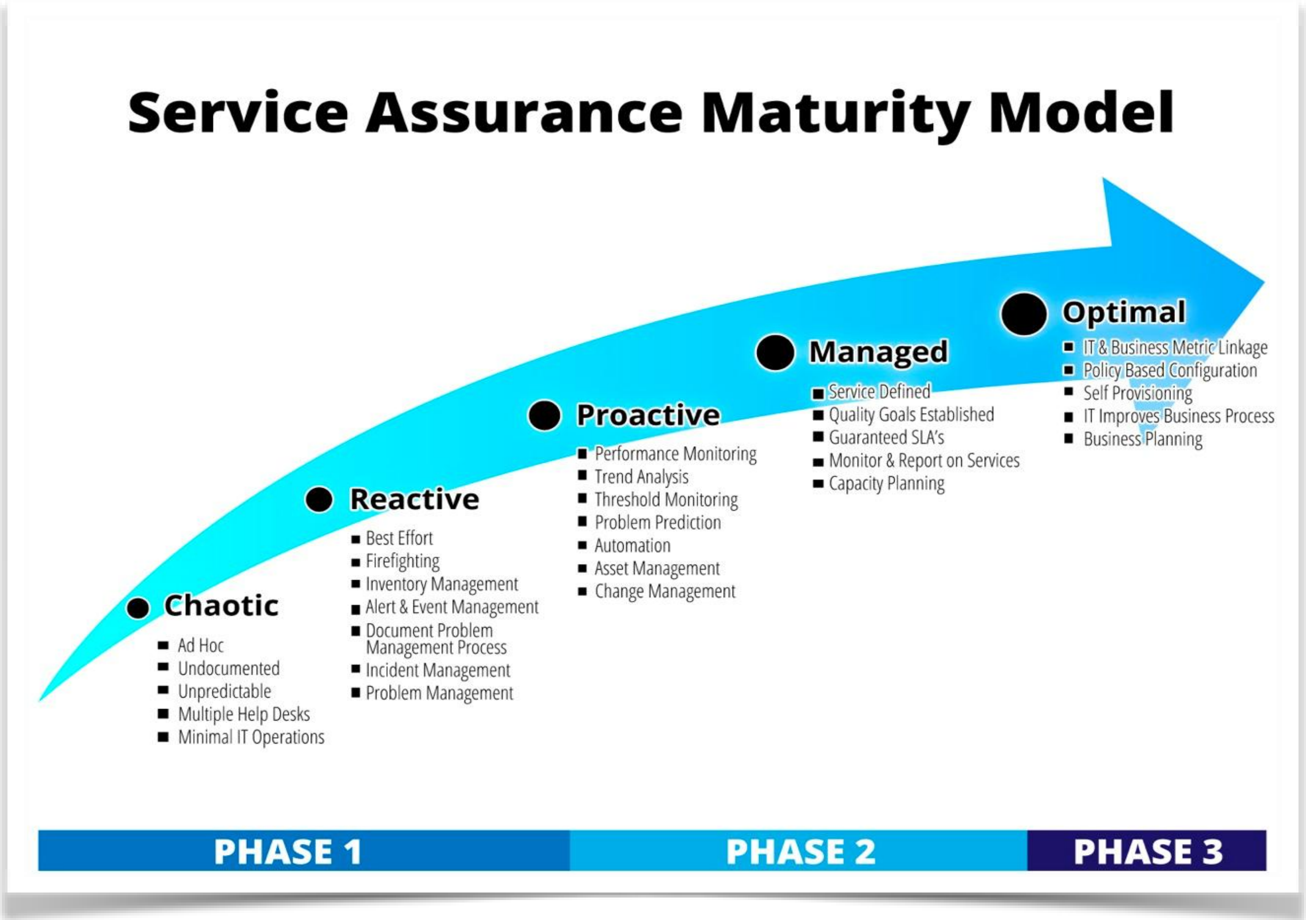
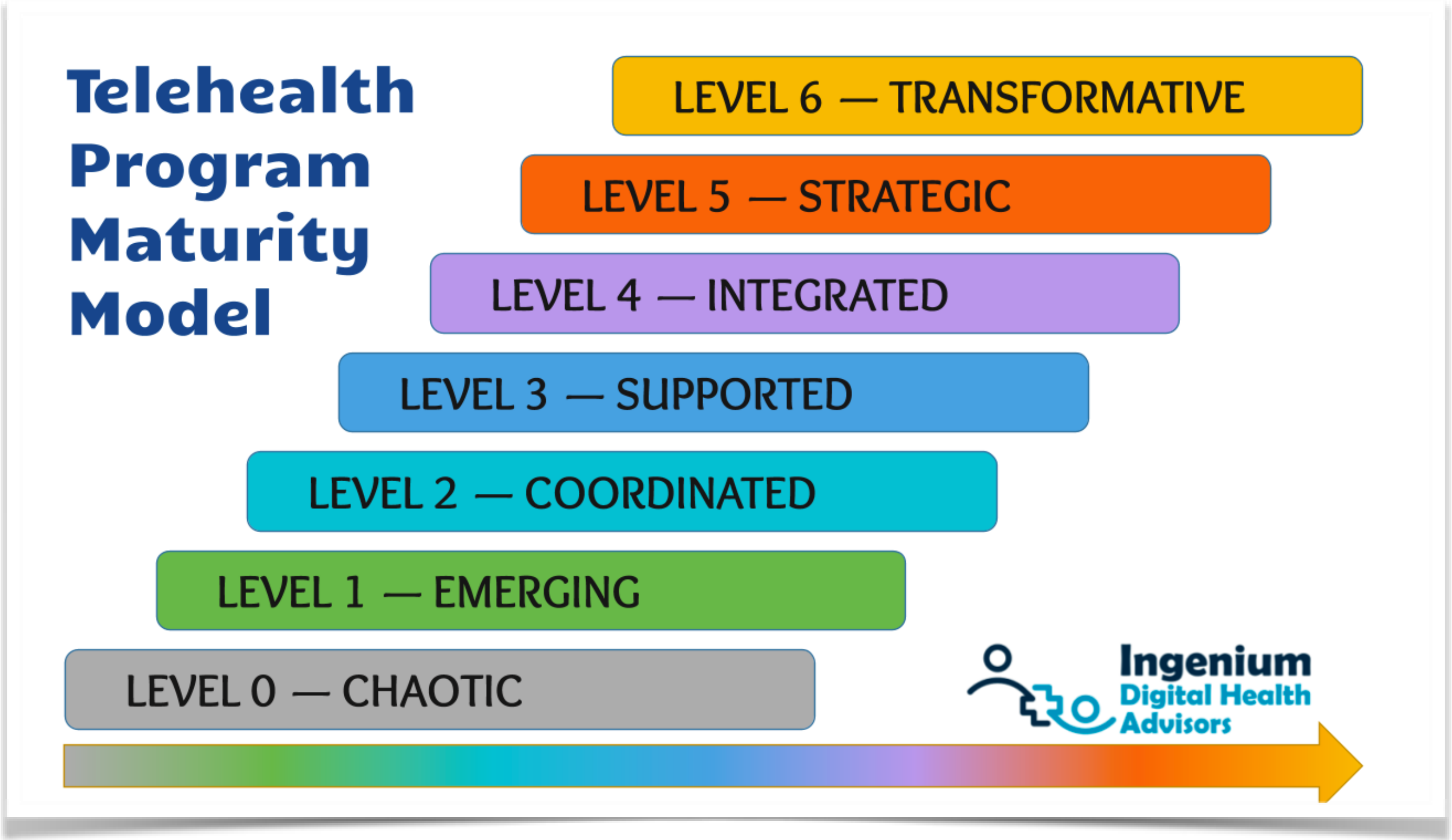
What is a Maturity Model?

A tool to evaluate current level of capability and guide progression.

Helps organizations:

- Identify gaps
- Prioritize investments
- Develop and implement policies, processes, and technologies

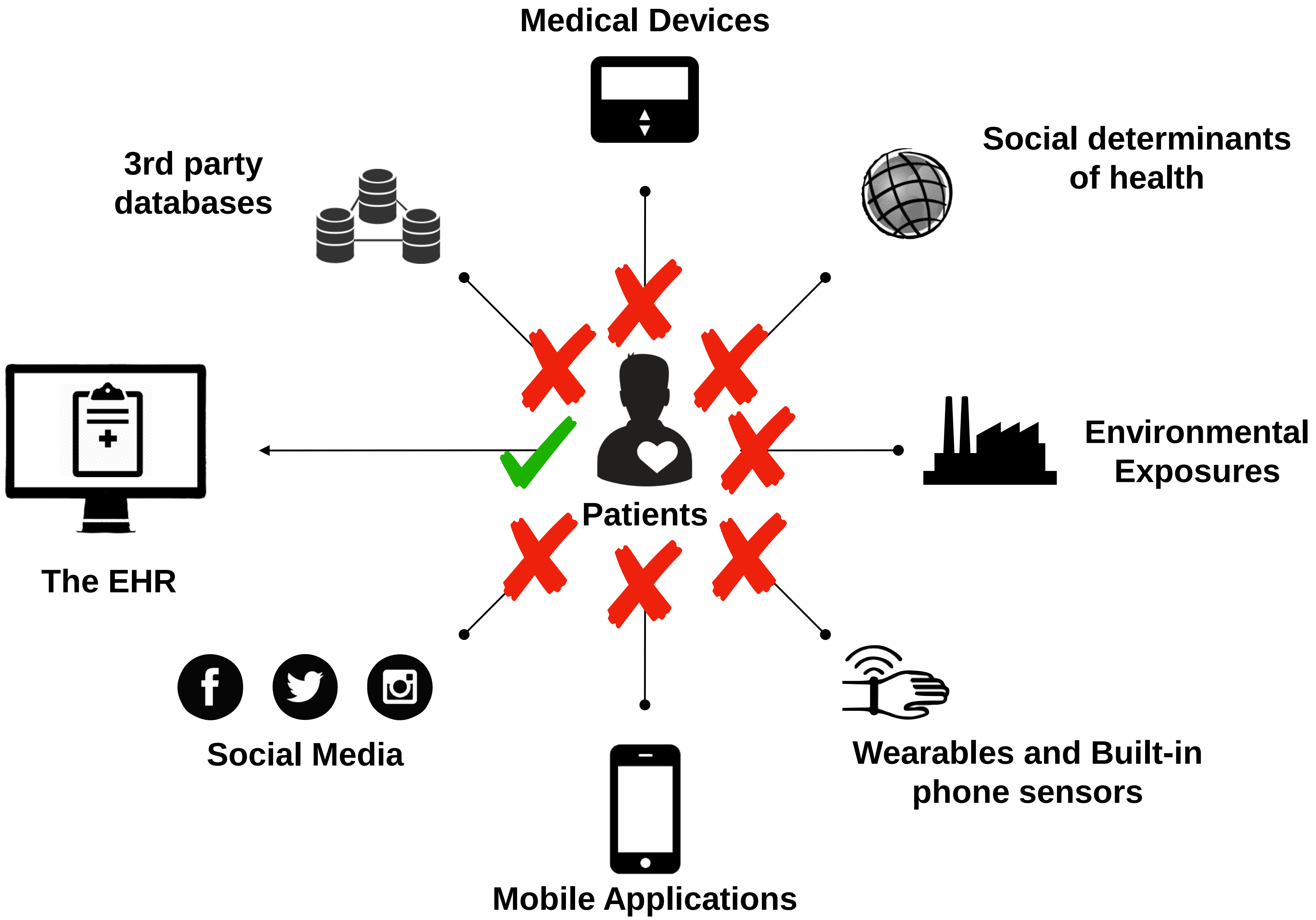




STAGE	HIMSS Analytics EMRAM EMR Adoption Model Cumulative Capabilities
7	Complete EMR; External HIE; Data Analytics, Governance, Disaster Recovery, Privacy and Security
6	Technology Enabled Medication, Blood Products, and Human Milk Administration; Risk Reporting; Full CDS
5	Physician documentation using structured templates; Intrusion/Device Protection
4	CPOE with CDS; Nursing and Allied Health Documentation; Basic Business Continuity
3	Nursing and Allied Health Documentation; eMAR; Role-Based Security
2	CDR; Internal Interoperability; Basic Security
1	Ancillaries - Laboratory, Pharmacy, and Radiology/Cardiology information systems; PACS; Digital non-DICOM image management
0	All three ancillaries not installed

STAGE	HIMSS Analytics O-EMRAM Outpatient EMR Adoption Model Cumulative Capabilities
7	Complete EMR: external HIE, data analytics, governance, disaster recovery
6	Advanced clinical decision support; proactive care management, structured messaging
5	Personal health record, online tethered patient portal
4	CPOE, Use of structured data for accessibility in EMR and internal and external sharing of data
3	Electronic messaging, computers have replaced paper chart, clinical documentation and clinical decision support
2	Beginning of a CDR with orders and results, computers may be at point-of-care, access to results from outside facilities
1	Desktop access to clinical information, unstructured data, multiple data sources, intra-office/informal messaging
0	Paper chart based

Why do we need a maturity model for Diabetes Technologies?



Problems Identified

1. **Fragmented & Inconsistent Adoption**
   - Diabetes technologies (CGMs, pumps, AID systems) are often used inconsistently across clinicians and institutions.
2. **Workflow Complexity & Provider Burden**
   - Clinicians must use multiple, disconnected systems to manage diabetes care.
3. **Poor Data Integration & Usability**
   - Device data is not seamlessly integrated into EHRs or clinical decision tools.
4. **Missed Financial Opportunities & Waste**
   - Lack of structured billing or reimbursement for diabetes technology services.
5. **Limited Population Health Insights**
   - Data isn't analyzed systematically to drive population health strategies.
6. **Stagnation in Innovation & Scaling**
   - Challenges with new technologies being tested and scaled across the system.

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Why a Diabetes Technology Maturity Model?

To design a structured framework for healthcare institutions to assess, guide, and advance their integration of diabetes-related technologies.

As diabetes technologies (e.g., CGMs, insulin pumps, AID systems) become more central to clinical practice, organizations need a structured way to ensure these tools are:

- Effectively integrated into clinical workflows.
- Supported by data systems that enable real-time decision-making.
- Financially sustainable, with clear billing and reimbursement strategies.
- Driving population health improvements through analytics and targeted interventions.
- Continuously evolving through innovation and scalability.

What is the Diabetes Technology Maturity Model?

The Diabetes Technology Maturity Model (DTMM) is an evaluation tool that helps healthcare organizations assess their adoption and integration of diabetes-related technologies.

It enables institutions to:

1. Assess their current capabilities, identify gaps, and advance systematically across key domains such as clinical integration, data interoperability, patient device management, analytics, financial sustainability, and innovation.
2. Align their processes, technology, and outcomes to deliver more effective, data-driven, and patient-centered diabetes care.
3. Plan futured technology related investments and workflows according a well-defined framework.
4. Promote cross team alignment and ensure that investments in technology lead to better outcomes, efficiency, and equity in diabetes management

Who is the Diabetes Technology Maturity Model for?

The DTMM is designed for a broad range of healthcare stakeholders who are responsible for adopting, integrating, managing, and optimizing diabetes technologies across healthcare systems.

It’s especially valuable for:

- **Healthcare Providers & Clinical Teams:** *Endocrinologists, Primary Care Providers, Diabetes Educators, Nursing Leaders*
- **Healthcare Organizations & System Leaders:** *Hospital & Health System Administrators, Chief Medical Officers, Clinical Operations Executives*
- **IT & Data Leaders:** *Chief Information Officers (CIOs), Health IT Teams, Data Integration Specialists*
- **Financial & Reimbursement Leaders:** *Chief Financial Officers (CFOs), Billing Managers, Value-Based Care Teams*
- **Innovation & Strategy Teams:** *Clinical Innovators, Digital Health Leaders, Quality Improvement Leaders*

How to use the Diabetes Technology Maturity Model?

The final DTMM will be designed as a self-assessment tool.

General Recommendation:

1. **Understand the model's structure:** Review DTMM Domains & Levels (reading through resource)
2. **Score current capabilities:** Use DTMM criteria chart to rate performance and assess current state. *(Collect input across teams: perspectives from clinical, IT, operations, & patient facing roles) (Validate with evidence: cross check with documentation, metrics, system data, workflow protocols)*
3. **Identify gaps & opportunities:** Pinpoint areas of underperformance or fragmentation in using diabetes technology and data effectively
4. **Set goals and prioritize actions**: Use DTMM model to set realistic goals that move toward next level in maturity, defining a roadmap and timeline
5. **Track progress:** Reassess over time to monitor improvements, measure impact, and refine strategies based on progress and evolving needs.

When to use the Diabetes Technology Maturity Model?

Recommended Cadence

Minimum: Annually

Maximum: Quarterly

Ideal times to use the DTMM

- Start of a fiscal year
- Start of a planning cycle
- Before and/or after launching a new initiative / process
- Adopting new tools
- During accreditation, funding, or Value Based Care assessments
- When experiencing gaps / pain points

CURRENT ITERATION

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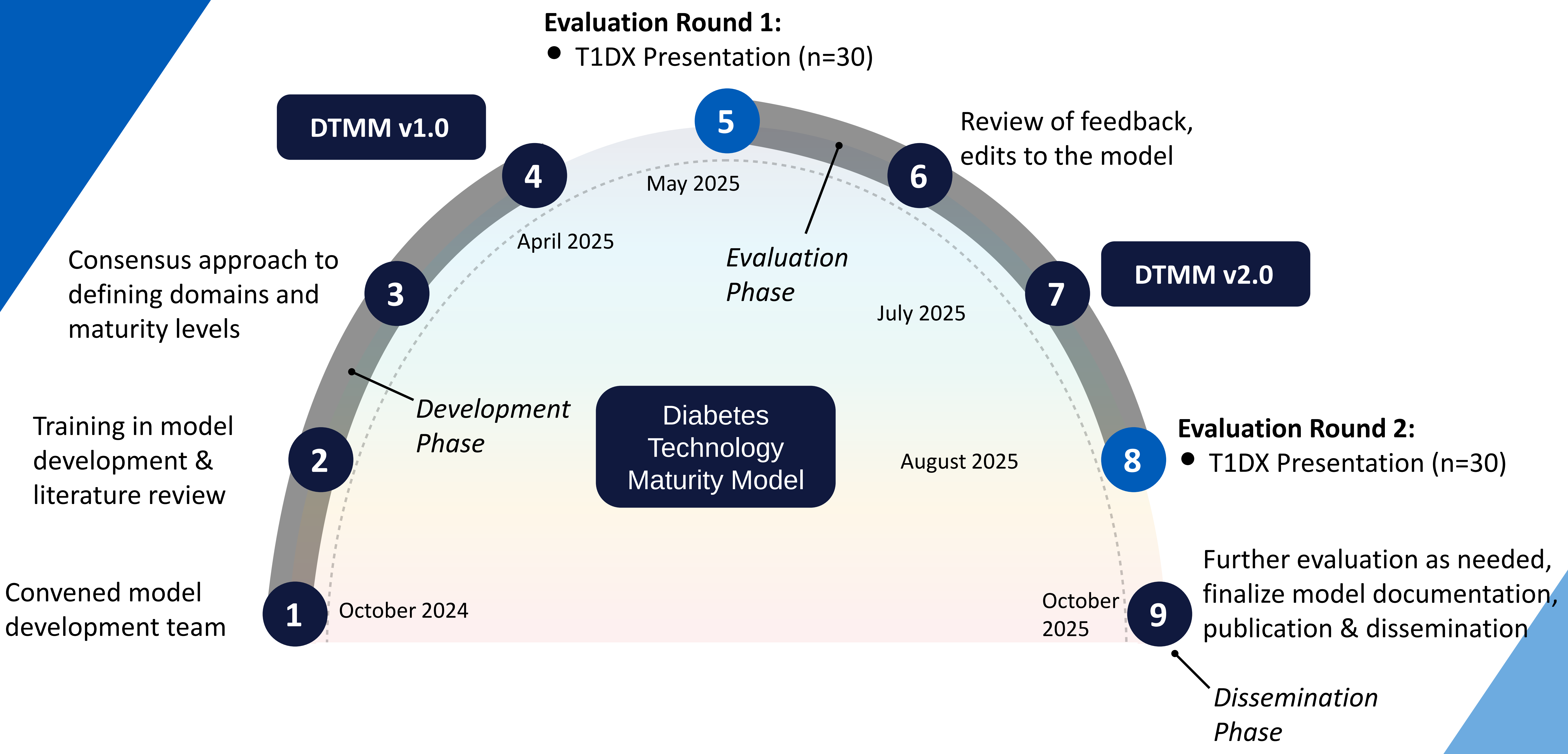
METHODOLOGY



DEFINING DTMM MATURITY DOMAINS

6 Domains of Maturity

- Clinical Process & Workflow Integration
- Patient Device Management
- Data Integration
- Population Health Analytics
- Financial Sustainability & Reimbursement
- Innovation & Continuous Improvement

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DEFINING DTMM MATURITY DOMAINS

6 Domains of Maturity

- Clinical Process & Workflow Integration
- Patient Device Management
- Data Integration
- Population Health Analytics
- Financial Sustainability & Reimbursement
- Innovation & Continuous Improvement

Domains arise from the problems identified:

- Fragmented & Inconsistent Adoption
- Workflow Complexity & Provider Burden
- Poor Data Integration & Usability
- Missed Financial Opportunities & Waste
- Limited Population Health Insights
- Stagnation in Innovation & Scaling

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DEFINING DTMM MATURITY LEVELS

6 Domains of Maturity

- Clinical Process & Workflow Integration
- Patient Device Management
- Data Integration
- Population Health Analytics
- Financial Sustainability & Reimbursement
- Innovation & Continuous Improvement

Defining Maturity Levels

- **Level 1: Absent**
- **Level 2: Ad Hoc**
- **Level 3: Emerging**
- **Level 4: Developing**
- **Level 5: Integrated**
- **Level 6: Optimized**

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Approach to Levels		
Level	Title	Definition
Level 1	Absent	There is no formal strategy, structure, or system in place related to the domain. Activities, if present, are isolated, uncoordinated, and not institutionally supported. There is no data infrastructure, role clarity, or quality oversight.
Level 2	Ad Hoc	Efforts are sporadic and largely dependent on individual initiative. Roles and responsibilities are unclear, and practices are reactive rather than proactive. Processes are inconsistent, unstandardized, and lack documentation or organizational ownership.
Level 3	Emerging	Initial frameworks or processes are in development. Basic roles, tools, or strategies exist but are inconsistently applied. Early structures (e.g., workflows, pilots, documentation) are present, though still limited in scale, scope, or sustainability.
Level 4	Developing	Standardized processes and structured systems are implemented across multiple teams or settings. Staff roles are defined, and infrastructure is in place to support consistency and reliability. Data begins informing decision-making, and performance monitoring is introduced.
Level 5	Integrated	Domain practices are embedded across the organization and supported by advanced tools, training, and performance tracking. Data flows are bi-directional and routinely analyzed. Staff are equipped for sustained execution, and systems are aligned with broader strategic goals (e.g., value-based care, QI frameworks).
Level 6	Optimized	Practices are adaptive, predictive, and continuously improved based on real-time data, AI tools, and evolving best practices. Systems are scalable, interoperable, and enable proactive care delivery or institutional advancement. The organization demonstrates leadership and innovation in this domain, contributing to external learning, policy, or research.

Your role in the Diabetes Technology Maturity Model

As a Data Science Committee member, your involvement will be critical to validating and refining the DTMM to ensure it is relevant and practical for real-world use.

Today

1. A domain will be presented
2. Evaluate your institution’s current capability by assigning a level for that domain
3. Provide your experience with using the model and share feedback
4. Repeat steps for each domain

Acquire Baseline, Test Usability, Provide Feedback

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Via Google Form:
https://forms.gle/d64swgzcXWdxBGkF6

Survey Breakdown

- Domain Presented ⇨ 1 Evaluation Question ⇨ 1 Feedback Question
- The entire survey should take less than 10 minutes to complete.

Select the Level That Best Reflects Your Current State

- Choose the highest level for which your organization consistently meets most / all of the criteria.
- If your organization is in transition between two levels, select the lower level to ensure a conservative and realistic assessment.

Domain 1: Clinical Process and Workflow Integration

The development, standardization, and optimization of clinical processes to support the effective and consistent use of diabetes technologies in healthcare settings. Key elements include defining staff responsibilities, establishing team-based workflows, providing structured training, and ensuring infrastructure readiness (e.g., IT systems, physical space).

	Summary	Description
Level 1	*No Defined Clinical Processes*	No standardized workflows, defined roles, or staff training related to diabetes technologies. Use of devices is ad hoc and provider-dependent. Infrastructure (e.g., space, systems, IT) is not in place to support consistent implementation.
Level 2	*Unstructured & Undefined Responsibilities*	Some staff members incorporate diabetes technologies, but processes are inconsistent and not standardized. Roles and responsibilities are unclear, with no formal documentation, training materials, or defined workflows. Infrastructure or access may vary across teams or settings.
Level 3	*Initial Workflow Development*	Basic workflows are developed for diabetes technology use, including defined roles for device setup, data review, and patient education. Informal training materials (e.g., slide decks, SOPs) are created and shared across some teams. Implementation varies, and infrastructure gaps (e.g., devices, network access) may still limit consistency.
Level 4	*Formalized Workflows & Staff Resources*	Standardized, team-based workflows are implemented across care settings. Roles are clearly defined and documented. Staff have access to structured resources such as training programs, workflow diagrams, and quick-reference guides. Dedicated time, space, and infrastructure are allocated for diabetes technology. Initial tracking of workflow adherence or process success begins.
Level 5	*Consistent Execution & Performance Tracking*	Workflows are consistently executed across departments and embedded in EHR-based documentation, alerts, and task flows. Staff receive ongoing training, and the organization is equipped with the necessary hardware, software, and support systems. Workflow performance is monitored via metrics such as adoption rates, process completion, and staff competency. Basic automation (e.g., auto-populated documentation, device-triggered alerts) is introduced to reduce burden and improve efficiency.
Level 6	*Data-Driven Optimization & Adaptive Workflows*	Clinical workflows are dynamically adjusted based on real-time performance data, staff feedback, and evolving best practices. Quality improvement cycles (e.g., PDSA) are used to drive iterative changes. Infrastructure is scalable and flexible, supporting new technologies and expanding use cases. Roles and workflows evolve to match innovation in diabetes care. Advanced automation (e.g., AI-driven alerts, adaptive care pathways, real-time documentation support) enables efficient, precise, and responsive care delivery. Staff remain well-trained through continuous education and competency validation.

Domain 2: Patient Device Management

The overall management and support of patient-facing devices used in diabetes care.
Key elements include establishing structured processes for device selection, patient education, long-term support, and replacement strategies to ensure safe, efficient, and effective use of diabetes technology.
Diabetes technologies include: Continuous Glucose Monitors (CGMs), Blood Glucose Meters (BGMs), Insulin Pumps, Smart Pens, and Automated Insulin Delivery (AID) Systems.

	Summary	**Description**
Level 1	*No Device Strategy*	No formal process for device selection, support, or tracking. Patients are left to independently manage devices or rely on manufacturers for education and troubleshooting. The care team is not routinely involved in device decisions or oversight.
Level 2	*Unstructured & Reactive*	Some providers offer device guidance, but roles and responsibilities are undefined. Support is reactive and varies widely across providers or teams. There are no standard protocols for training, maintenance, or follow-up. Patients receive inconsistent education, and there is no process for tracking device concerns.
Level 3	*Initial Device Management Framework*	Basic processes are established for device selection, patient onboarding, and initial training. Early role assignments begin to clarify staff responsibilities for device-related tasks. Some documentation or tracking exists, but long-term support and replacement strategies are inconsistently applied. Follow-up practices may be informal or optional.
Level 4	*Structured Management & Support Systems*	Standardized workflows for device management are implemented across care settings. Clear roles are assigned for device setup, education, troubleshooting, and follow-up. Staff follow structured protocols, and patients receive consistent onboarding and training. Maintenance schedules and replacement strategies are documented. Device-related concerns are actively tracked during routine care.
Level 5	*Proactive Maintenance & Lifecycle Management*	Device use is fully integrated into care delivery with structured systems for tracking device assignment, performance, software updates, and replacement timelines. Dedicated support channels enable ongoing troubleshooting and optimization. Patients receive regular check-ins and refresher training. Equity of access and device adoption across populations is monitored. Data from devices informs care planning and workflow integration.
Level 6	*Adaptive & Predictive Device Management*	Device management is intelligent, personalized, and data-driven. Predictive analytics identify potential device failures, adherence risks, or support needs before they impact care. AI tools support patients through automated troubleshooting and guidance. Device selection and training are tailored to patient-specific behaviors and preferences. Lifecycle management systems adapt based on real-world performance and integrate with the EHR for real-time data exchange and decision support. The system is scalable, equitable, and capable of evolving with new device innovations.

Domain 3: Data Integration

The seamless, near real-time exchange of data between diabetes technologies (e.g., CGMs, BGMs, insulin pumps, AID systems) and clinical systems such as EHRs, remote monitoring platforms, and decision support tools.
Key elements include data is standardized, accessible, and clinically usable, while minimizing the number of platforms and workflows required by clinicians.

	Summary	**Description**
Level 1	*No Digital Integration*	Diabetes device data is not integrated into clinical systems. Data is collected through patient reports, handwritten logs, or viewed directly from device screens. Information is often missing, inaccessible, or fragmented, limiting its usefulness for clinical decision-making. No digital tools are in place for providers to view or manage this data.
Level 2	*Manual & Fragmented Data Entry*	Data from devices is manually entered or uploaded into basic tools such as Excel. Some device reports may be accessible through manufacturer portals, but they are not connected to the EHR. The data is non-standardized, inconsistently captured, and often duplicated or incomplete. Visualizations are static, unstructured, and exist outside of the clinical workflow.
Level 3	*Limited & Unstructured Integration*	Interactive tools like Power BI or Tableau are used to visualize diabetes data. However, the data resides in separate platforms, requiring clinicians to toggle between systems. Visualizations may be interactive but are non-standardized, inconsistently used, and disconnected from clinical documentation or workflows. There is no real-time data flow, and insights are typically retrospective.
Level 4	*Structured Integration & Standardization*	Automated data flows exist between diabetes devices and EHRs or clinical platforms. Data is transmitted in structured formats such as PDFs, JSON, or FHIR, allowing for greater consistency and usability. Clinical teams begin adopting emerging documentation standards such as the T1DX Data Spec, LOINC, and SNOMED CT. While workflows improve, they often still involve multiple systems or tools, and clinical decision support is not yet in place.
Level 5	*Bidirectional Data Exchange*	Diabetes data is fully integrated into the EHR and clinical workflows, with near real-time access. Systems support bidirectional exchange using interoperability standards such as FHIR and IEEE 11073. Documentation, alerts, and clinical decision support tools are embedded into the provider's primary workflow. Data is standardized across platforms using common data models, ensuring consistent meaning and interoperability. Clinicians operate within a streamlined, unified workflow that minimizes friction and maximizes efficiency.
Level 6	*AI-Enhanced Decision Support & Real-Time Insights*	Predictive, AI-driven insights are embedded directly within the EHR or clinical system. Clinicians receive real-time alerts, dosing suggestions, trend forecasts, and patient risk stratification. These systems adapt based on clinician preferences and behavior, optimizing relevance and minimizing alert fatigue. Data is fully interoperable across platforms and is used to power precision care delivery and population-level decision-making. A single, unified interface allows clinicians to complete all diabetes-related tasks efficiently and seamlessly.

Domain 4: Population Health Analytics

The systematic analysis of data generated by diabetes technologies to drive data-informed decision-making, reduce care variability, improve health outcomes, and optimize population health strategies.
Key elements include how an organization moves from retrospective reporting to predictive, personalized interventions across diverse patient populations.

	Summary	**Description**
Level 1	*No Analytics Capability*	The organization does not collect, aggregate, or analyze diabetes technology data beyond individual patient charts. There is no infrastructure to view trends, compare groups, or understand outcomes at the population level. Reporting is limited to isolated clinical encounters, with no population lens.
Level 2	*Unstructured & Reactive Analytics*	Some manual or one-off analyses are conducted to support external requests, research projects, or compliance reporting. These efforts are reactive and not tied to a broader population health strategy. Data is extracted inconsistently, without standard formats or centralized oversight. Findings are rarely used to inform care.
Level 3	*Basic Aggregation & Retrospective Reporting*	Diabetes technology data is aggregated across populations to support retrospective analysis. The organization identifies broad trends, such as average A1C, device adoption rates, or time-in-range benchmarks. However, insights are generalized, lagging, and not directly actionable. Reporting is periodic and may not inform clinical or operational decision-making.
Level 4	*Structured Analytics & Care Variation Analysis*	Population health analytics are routinely conducted and integrated into quality improvement frameworks. The organization analyzes care variation, identifies high-risk cohorts, and monitors disparities across demographic or geographic groups. Structured dashboards and standardized metrics support more targeted interventions, though predictive capabilities and real-time tracking remain limited.
Level 5	*Risk Stratification & Targeted Interventions*	Advanced analytics enable proactive risk stratification and targeted care strategies. Patient cohorts are segmented based on glycemic patterns, device engagement, or clinical risk, triggering interventions such as remote monitoring or early insulin adjustment. Dashboards are used by clinical and leadership teams to monitor performance, support care coordination, and reduce variability. Insights are tied to quality metrics, resource optimization, and care model refinement.
Level 6	*Predictive, Personalized, & Population-Level Optimization*	AI-enhanced analytics deliver predictive, near real-time insights into patient risk, behavioral trends, and disease trajectories. Personalized interventions are triggered automatically or semi-automatically, integrated into care pathways and care management systems. Analytics inform system-wide planning, policy development, and equity initiatives. Tools support dynamic registries, real-time alerts, and care gap closure. Data is linked to value-based care models and used for continuous population-level optimization across the organization.

Domain 5: Financial Sustainability & Reimbursement

The financial sustainability, cost recovery, and reimbursement strategies related to diabetes technology adoption. Key elements include how well an organization tracks internal costs, implements billing mechanisms, and integrates diabetes technology into financial and value-based care models to ensure long-term viability.

	Summary	**Description**
Level 1	*No Financial Strategy for Diabetes Technology*	The organization does not track costs associated with diabetes technology implementation or usage. Billing for diabetes-related services is not pursued. There is no consideration of financial sustainability, and technologies may be adopted inconsistently or remain unfunded.
Level 2	*Unstructured Cost Tracking & Limited Billing*	Some efforts are made to track internal costs, and occasional billing may occur for services such as CGM data review, RPM, or telehealth visits. However, these efforts are inconsistent and not guided by a formal reimbursement strategy. Documentation and coding practices vary across clinicians or departments.
Level 3	*Basic Cost Recovery Mechanisms*	Billing mechanisms for diabetes-related services are in place, including standard CPT codes for CGM interpretation or RPM. Internal cost tracking begins to inform budgeting, though reimbursement optimization remains limited. Financial models are largely reactive, and denied claims or missed billing opportunities are not systematically addressed.
Level 4	*Structured Billing & Reimbursement Strategy*	A formalized billing strategy exists for all reimbursable diabetes technology services. The EHR is configured to support documentation requirements and streamline claim generation. Clinical staff are trained to document services accurately. Internal costs are tracked consistently, and the organization begins aligning financial performance with broader value-based care goals.
Level 5	*Optimized Cost Recovery & Financial Performance*	Billing and reimbursement processes are fully integrated into clinical workflows. The EHR captures all necessary documentation automatically, reducing administrative burden and ensuring consistent claim generation. Reimbursement metrics (e.g., denial rates, time-to-payment) are monitored in real time. Financial data informs QI efforts, supports return-on-investment analyses, and contributes to population-level resource planning.
Level 6	*Strategic Financial Integration & Sustainability*	Diabetes technology is embedded in advanced payment models such as ACOs, capitation, or risk-sharing arrangements. Predictive financial analytics optimize cost recovery and resource allocation. The organization demonstrates clear, measurable financial and clinical value from technology use. Sustainability is supported through innovative reimbursement strategies, payer collaboration, and alignment of technology investments with long-term population health goals.

Domain 6: Innovation, Research, and Continuous Improvement

The ability to advance the use of diabetes technologies through structured quality improvement, clinical research, and innovation. Key elements include how well how well an institution can refine technology use, strategically participate in clinical trials, research, and apply structured improvement methodologies (e.g., PDSA cycles) to expand diabetes technology adoption.

	Summary	Description
Level 1	*No Innovation or Improvement Strategy*	The organization has no strategy for testing, scaling, or refining diabetes technologies. Adoption is limited to isolated efforts and lacks institutional oversight. There is no engagement in research, quality improvement, or structured innovation activities.
Level 2	*Uncoordinated, Champion-Driven Efforts*	Innovation efforts or pilots are driven by individual staff members or local champions. There is no institutional framework for evaluating or scaling these efforts. Research participation is sporadic, informal, and uncoordinated. Lessons learned are not widely shared or applied.
Level 3	*Early-Stage Innovation & Pilot Adoption*	The organization supports small-scale pilots of new diabetes technologies with initial structures to evaluate success. Some use of QI methodologies (e.g., PDSA) is emerging, but scalability plans are limited or reactive. Research participation is clinician-driven rather than institutionally led. Efforts may be fragmented across teams or departments.
Level 4	*Formal Evaluation & Scaling Frameworks*	There is a formal process for testing, evaluating, and scaling new diabetes technologies. Successful pilots include planned resource allocation and structured performance evaluation. Improvement methodologies are routinely applied during scaling. The organization participates in clinical trials and research initiatives aligned with institutional goals.
Level 5	*Strategic Innovation & Institutional Research Support*	Diabetes technologies are routinely piloted, evaluated, and scaled across multiple care settings. Innovation is embedded into strategic planning and quality improvement infrastructure. External collaborations with academic and industry partners are leveraged to enhance innovation capacity. QI methods are institutionalized and inform continuous refinement of care models.
Level 6	*Learning Health System for Diabetes Innovation*	The organization operates as a dynamic learning health system. It rapidly integrates research findings, real-world performance data, and predictive insights to optimize technology use. Collaborations with academic institutions, startups, and industry partners support the development and testing of emerging innovations, such as AI-driven tools, digital twins, or smart implants. Staff across all levels contribute to structured improvement and knowledge-sharing cycles, ensuring scalable and equitable impact.

DIABETES TECHNOLOGY MATURITY MODEL						
Domain	CLINICAL PROCESS & WORKFLOW INTEGRATION	PATIENT DEVICE MANAGEMENT	DATA INTEGRATION	POPULATION HEALTH ANALYTICS	FINANCIAL SUSTAINABILITY & REIMBURSEMENT	INNOVATION, RESEARCH, & CONTINUOUS IMPROVEMENT
Level 1	No Defined Clinical Processes	No Device Strategy	No Digital Integration	No Analytics Capability	No Financial Strategy for Diabetes Technology	No Innovation or Improvement Strategy
Level 2	Unstructured & Undefined Responsibilities	Unstructured & Reactive	Manual & Fragmented Data Entry	Unstructured & Reactive Analytics	Unstructured Cost Tracking & Limited Billing	Uncoordinated, Champion-Driven Efforts
Level 3	Initial Workflow Development	Initial Device Management Framework	Limited & Unstructured Integration	Basic Aggregation & Retrospective Reporting	Basic Cost Recovery Mechanisms	Early-Stage Innovation & Pilot Adoption
Level 4	Formalized Workflows & Staff Resources	Structured Management & Support Systems	Structured Integration & Standardization	Structured Analytics & Care Variation Analysis	Structured Billing & Reimbursement Strategy	Formal Evaluation & Scaling Frameworks
Level 5	Consistent Execution & Performance Tracking	Proactive Maintenance & Lifecycle Management	Bidirectional Data Exchange	Risk Stratification & Targeted Interventions	Optimized Cost Recovery & Financial Performance	Strategic Innovation & Institutional Research Support
Level 6	Data-Driven Optimization & Adaptive Workflows	Adaptive & Predictive Device Management	AI-Enhanced Decision Support & Real-Time Insights	Predictive, Personalized, & Population-Level Optimization	Strategic Financial Integration & Sustainability	Learning Health System for Diabetes Innovation

DISCUSSION / Q&A

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THANK YOU!

We thank you for your contributions in this initiative!

For any questions, reach out to risingt1dealliance@luriechildrens.org

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Appendix

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Part 3: Bringing it All Together - Project Sail

What will we do?

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Philosophy: Every person with diabetes deserves high quality, data-driven care, regardless of where they get their care.

Goal: To build and disseminate the technologies and practices that enable healthcare organizations to deliver data-driven diabetes care.

Approach:

1a TECHNOLOGY

Combine and refine all the relevant technologies to support data integration and aggregation:

- EHR assets
- CGM data integration
- D-Data Dock
- Common Data Tools
- Diabetes Technology Maturity Model

1b CARE DELIVERY

Document and refine our approach to population health management, quality improvement, and personalized interventions:

- Rapid Learning Lab (RLL):
    - Overall methodology
    - Intervention library (validate and expand)

2 DOCUMENTATION

Develop training, support, and dissemination materials that will enable other organizations to replicate our technology and processes:

- Technical Implementation Guide
- Clinical & Operational Implementation Guide
- RTA Website, Newsletter, and Forums
- D-Data Dock documentation

3 IMPLEMENTATION

Complete 3 implementations (Lurie, KU, CCMC) in order to refine our dissemination materials and approach:

- D-Data Dock deployment
- CGM data integration
- 2 PDSA cycles of RLL interventions leveraging D-Data Dock

4 DISSEMINATION

Prepare for broad scale dissemination and adoption of our technologies and methods:

- T1DX Dissemination Plan
- Integration standards harmonization (iCoDE update)
- Roadmap for national CGM-EHR integration requirements

Part 2: CGM-EHR Integration and iCoDE

Timeline

2016
Dexcom Stanford Project

2017
Dexcom CHLA Project

2017 - 2020
Partnerships with Abbott, Medtronic, Glooko, Tidepool

2020
- DTS CGM in the Hospital Consensus
- DTM 2020
- Abbott-IDC integration

2021
- Development of iCoDE concept
- Discussions with industry and DTS

2022
- iCoDE working group form
- iCoDE Report published
- **Mark and Juan start collaborating**

2023
- Planning for iCoDE 2 (insulin devices)
- submission of current HCT grant

Automated integration of continuous glucose monitor data in the electronic health record using consumer technology Get access

Rajiv B Kumar, Nira D Goren, David E Stark, Dennis P Wall, Christopher A Longhurst

Journal of the American Medical Informatics Association, Volume 23, Issue 3, May 2016, Pages 532–537, https://doi.org/10.1093/jamia/ocv206

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Continuous Glucose Monitors and Automated Insulin Dosing Systems in the Hospital Consensus Guideline

Rodolfo J Galindo [1], Guillermo E Umpierrez [1], Robert J Rushakoff [2], Ananda Basu [3], Suzanne Lohnes [4], James H Nichols [5], Elias K Spanakis [6, 7], Juan Espinoza [8], Nadine E Palermo [9], Dessa Garnett Awadjie [10], Leigh Bak [11], Bruce Buckingham [12], Curtiss B Cook [13], Guido Freckmann [14], Lutz Heinemann [15], Roman Hovorka [16], Nestoras Mathioudakis [17], Tonya Newman [18], David N O'Neal [19], Michaela Rickert [20], David B Sacks [21], Jane Jeffrie Seley [22], Amisha Wallia [23], Trisha Shang [24], Jennifer Y Zhang [24], Julia Han [24], David C Klonoff [25]

The Need for Data Standards and Implementation Policies to Integrate CGM Data into the Electronic Health Record

Juan Espinoza, MD, FAAP, Nicole Y. Xu, BA, Kevin T. Nguyen, BA, more... Show all authors

First Published November 20, 2021 | Article Commentary | Check for updates
https://doi.org/10.1177/19322968211058148

> Diabetes Technol Ther. 2020 Aug;22(8):570-576. doi: 10.1089/dia.2019.0377. Epub 2020 Jul 10.

Integrating Continuous Glucose Monitor Data Directly into the Electronic Health Record: Proof of Concept

Juan Espinoza [1, 2], Payal Shah [1], Jennifer Raymond [2, 3]

> J Diabetes Sci Technol. 2021 Jul;15(4):916-960. doi: 10.1177/19322968

Diabetes Technology Meeting 2020

Trisha Shang [1], Jennifer Y Zhang [1], B Wayne Bequette [2], Jennifer K Rayr
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Laurel H Messer [9], Tim Heise [10], Carlos E Mendez [11], Sarah Kim [12], Barr
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The Launch of the iCoDE Standard Project

Nicole Y Xu [1], Kevin T Nguyen [1], Ashley Y DuBord [2], David C Klonoff [2, 3], Julian M Goldman [4], Shahid N Shah [5], Elias K Spanakis [6, 7], Charisse Madlock-Brown [8], Siavash Sarlati [2, 9], Azhar Rafiq [10], Axel Wirth [11], David Kerr, Raman Khanna [2], Scott Weinstein [12], Juan Espinoza [13]

RISING T1DE ALLIANCE

KEY PROBLEMS TODAY

1. Fragmented & Inconsistent Adoption:

Diabetes technologies (CGMs, pumps, AID systems) are often used inconsistently across clinicians and institutions.

Impact:

- Patients receive variable quality of care.
- Clinicians are unsure about best practices for device selection, support, or follow-up.
- Missed opportunities to standardize care and improve outcomes.

2. Worflow Complexity & Provider Burden

Clinicians must use multiple, disconnected systems to manage diabetes care.

Impact:

- Documentation errors, inefficiencies, and burnout.
- Data gets lost or is hard to access when needed.
- Delayed decisions due to lack of real-time information.

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3. Poor Data Integration & Usability

Device data is not seamlessly integrated into EHRs or clinical decision tools.

Impact:

- Clinicians don’t have timely, actionable insights.
- Data remains underutilized, preventing informed care.
- Manual data entry increases risk of errors and wastes time.

4. Missed Financial Opportunities & Waste

Lack of structured billing or reimbursement for diabetes technology services.

Impact:

- Unreimbursed care and technology costs strain budgets.
- Failure to bill for RPM, CGM review, or device management leads to lost revenue.
- Organizations underestimate true costs, limiting investment.

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5. Limited Population Health Insights

Data isn’t analyzed systematically to drive population health strategies.

Impact:

- High-risk patients aren’t identified early.
- Care variability and disparities go unaddressed.
- Missed chances for preventive care and improved outcomes at scale.

6. Stagnation in Innovation & Scaling

New technologies are tested locally, but never scaled across the system.

Impact:

- Promising innovations remain isolated.
- Lack of PDSA cycles or structured refinement blocks growth.
- Falling behind peers in AI, digital health, and value-based care readiness.