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Closing the Clinical Impact Evidence Gap: Practical RWE Strategies for Medical Devices and Diagnostics Using Registries, Research Partners, and Regulatory Data

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ISPOR Philadelphia

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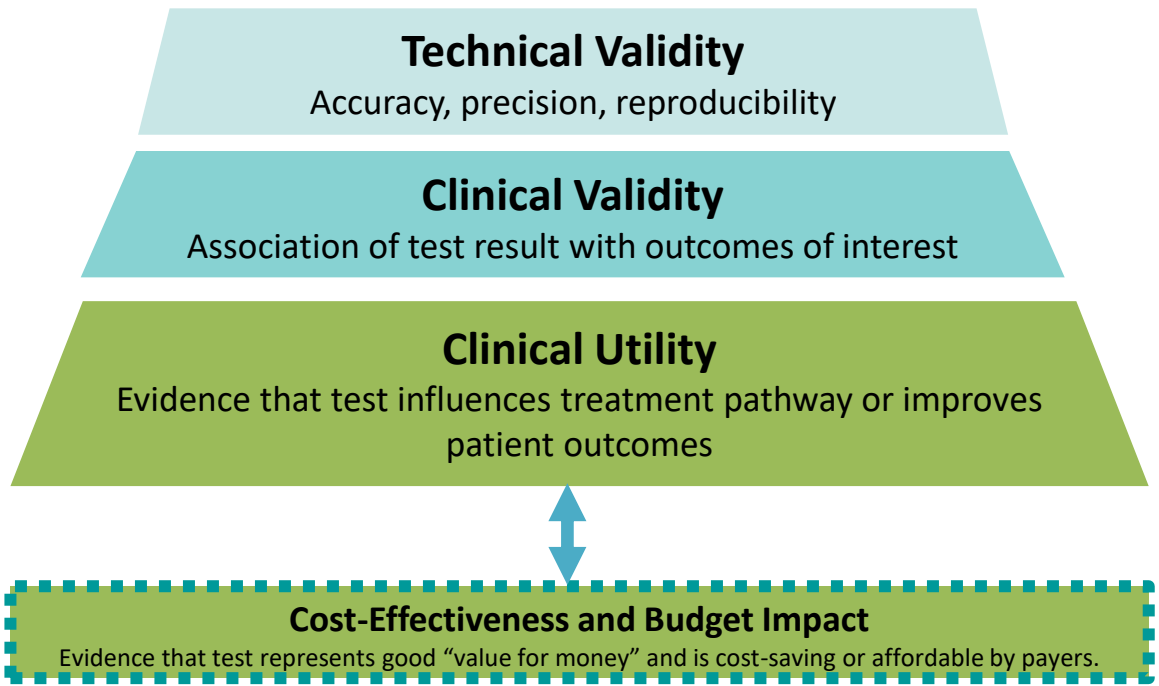
SECTION

1

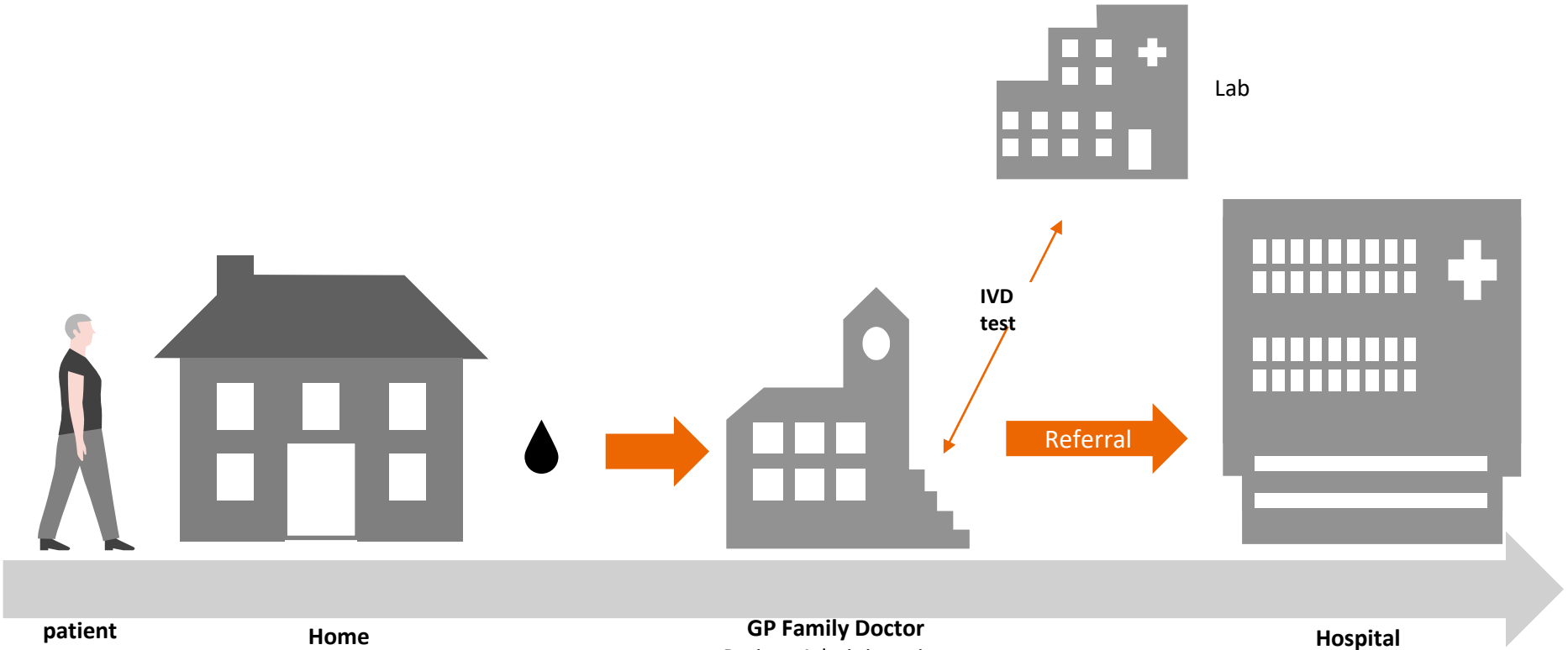
Diagnostics HEOR perspective

Evidence of Clinical Utility is Essential for Driving Payer Coverage



- Unlike pharma, RCTs are not required for lab dx regulatory approval
- Therefore, a compelling evidence plan is critical for coverage

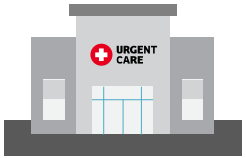
Operational Care Pathway Impact Is the Most Credible and Feasible Evidence for IVD Tests



Hospital Partnerships and Existing Data Are the Engine of Diagnostic RWE

Home Care

Physician Office

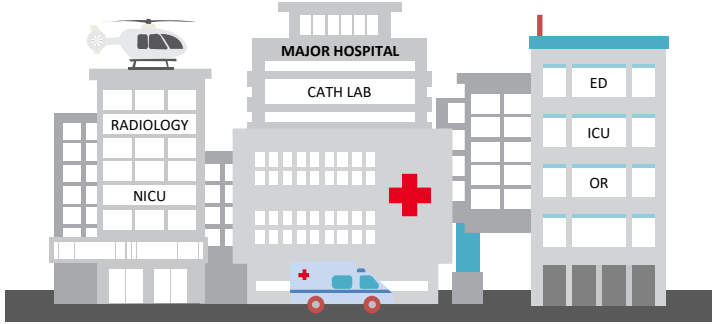


Clinic

Pharmacy

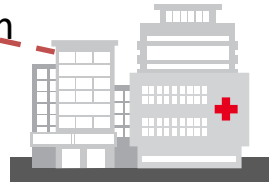
Dialysis Center

Small Hospital

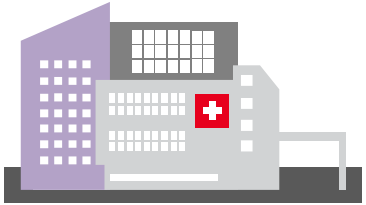


Major Hospital System

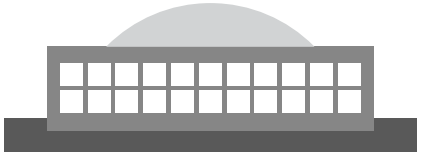
Small Hospital



Small Hospital



Stand-alone Hospital



Reference Lab

Research Institute

SECTION

2

Medical device HEOR perspective

Generating Device-Attributable Evidence through Secondary Data Sources (Even Without Unique Procedure Codes!)

Approach #1: Link device registration and/or device-derived data to an outcomes (Claims, EHR) data source

- Micra CED & CORE-CPP studies (device registration + Medicare claims data)
- GLIDE-HF study (device registration + Optum EHR data)

Approach #2: Linking clinical trial data or registry data to an outcomes (Claims, EHR) data source

- ALLEVIATE-HF+ (clinical trial data + Medicare claims data)
- Transcatheter Valve Therapies Registry (society registry data + Medicare claims

Approach #3: Leverage Chargemaster data to identify specific products for comparative safety analysis

- Multiple-use vs single-use power staplers utilized in patients undergoing video-assisted thoracic procedures (Premier Inc. Data)

SECTION

3

National registries perspective

RWE that bridges the gap between clinical trials and health policy decisions

STEP 1: THE FOUNDATION

Building a Robust RWE Infrastructure

REFLECT STUDY
Retrospective comparative cohort study using linked Swedish national registries

NDR
National Diabetes Register
More than 90% coverage of all adults with diabetes in Sweden, recording CGM use since 2016

NPR
National Patient Register
ICD-10 coded hospital admissions, inpatient care data

SPDR
Prescribed Drug Register
Nationwide pharmacy dispensing data, ATC codes, insulin regimen identification

WHY THIS MATTERS FOR RWE

- Population-level data — not a selected trial cohort
- Unique personal ID links across all three national registries
- Propensity score weighting (PS-IPTW) with double robust adjustment controls for confounding

TOTAL COHORT
T1D: 14,829 adults (up to 24 months follow-up)
T2D: 6,800 isCGM users vs 78,386 BGM controls

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STEP 2: THE EVIDENCE

Hard Clinical Endpoints — Beyond HbA1c

TYPE 1 DIABETES

n = 11,822 isCGM vs 3,007 BGM

TYPE 2 DIABETES

n = 5,168 isCGM vs 76,008 BGM controls

POST-HYPOGLYCAEMIA CVD RISK

Prior severe hypoglycaemia doubles CVD risk (2.06x).
isCGM reduced post-SHE CVD hospitalisations by 78% vs BGM

All p values less than 0.001

HbA1c reductions sustained to 24 months in both T1D and T2D

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STEP 3: THE VALUE

From RWE to Reimbursement and Access

WHAT MAKES THIS GOOD RWE?

1. **Scale**
   Among the largest real-world CGM studies globally — nearly 100,000 participants across T1D and T2D
2. **Hard Endpoints**
   Hospitalisations for CVD events, not just surrogate markers — directly relevant to payers
3. **Rigorous Methods**
   PS-IPTW with double robust adjustment, sensitivity analyses, and overdispersion testing
4. **Reproducibility**
   Consistent findings across T1D, T2D-MDI and T2D-Basal populations, and across multiple endpoints

FILLING THE EVIDENCE GAP

RCTs	→	REFLECT RWE
Short-term, Surrogate endpoints (HbA1c, TIR), Selected populations		Long-term (24 months) Hard endpoints (CVD, hospitalisations), Unselected real-world population

HTA READINESS

- **Cost-effectiveness modelling:** hospitalisation reductions translate directly into cost offsets
- **Budget impact:** demonstrated value for both intensive and non-intensive insulin regimens
- **Addresses HTA agency requirements** for real-world comparative effectiveness data on medical devices

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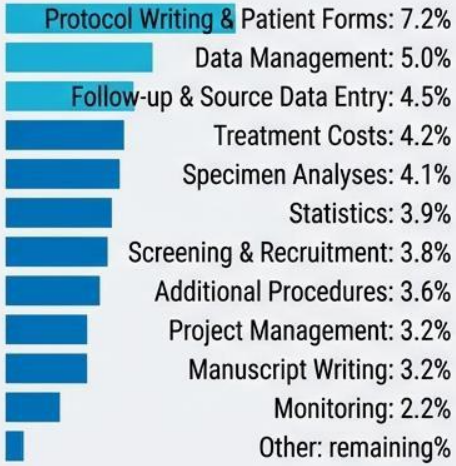
1 Eeg-Olofsson et al., "Initiation of Intermittently Scanned Continuous Glucose Monitoring Is Associated With Reduced Hospitalization for Acute Diabetes Events and Cardiovascular Complications in Adults With Type 1 Diabetes"; Eeg-Olofsson et al., "Severe Hypoglycaemia Is Associated with Increased Risk of Adverse Cardiovascular Complications in Adults with Type 1 Diabetes"; Nathanson et al., "Intermittently Scanned Continuous Glucose Monitoring Compared with Blood Glucose Monitoring Is Associated with Lower HbA1c and a Reduced Risk of Hospitalisation for Diabetes-Related Complications in Adults with Type 2 Diabetes on Insulin Therapies."

THE COST OF CARDIOVASCULAR TRIALS: TRADITIONAL RCT vs REGISTRY-BASED RCT

Combining data from Griessbach et al. (2024) and the TASTE vs TOTAL trial comparison

TRADITIONAL RCT COST BREAKDOWN



Median Total Cost: $645,824
Median Cost/Patient: $3,999

Griessbach et al. 2024, n=93 RCTs (CH, DE, UK)

CASE STUDY: THROMBUS ASPIRATION IN STEMI

TOTAL TRIAL
(Traditional RCT)
€15,000,000
87 centers | 48 months enrollment | 6-month follow-up

97% COST REDUCTION
Nearly identical clinical results

TASTE TRIAL
(Registry-Based RCT)
€500,000
30 centers | 33 months enrollment | 42-month follow-up

WHY RRCTS COST LESS

- Recruitment via existing registry (no site initiation costs)
- Randomisation module embedded in registry
- Baseline data collected routinely
- Endpoint data from registry and national records
- No CRF data entry or source data verification needed
- No separate monitoring visits required
- 70% of eligible patients included (vs typical 5-10% in traditional RCTs)

~~**Planning** 27.5%~~ | ~~**Conduct** 57.3%~~ | **Finalization** 12.7%

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Sources: Griessbach et al., J Clin Epidemiol 2024; Frobert et al., N Engl J Med 2013; Jolly et al. (TOTAL), Lancet 2015

REGISTRY-BASED RCT

THE APPROACH ENDORSED BY IQWiG FOR ROBUST REAL-WORLD EVIDENCE

THE PROBLEM WITH OBSERVATIONAL RWD

Observational real-world data are ill-suited to reliably measure treatment effects. Unknown confounders, missing data on patient characteristics, and inconsistent results undermine their evidentiary value for regulatory and HTA decision-making.

IQWIG POSITION: R-RCTs ARE THE ANSWER

- IQWiG (Institute for Quality and Efficiency in Health Care) explicitly advocates for registry-based RCTs as a leaner, cheaper, and more robust alternative to conventional RCTs — NOT observational data.
- IQWiG found **RCTs available for ~60% of new orphan drugs entering the German market (2014–2018),** challenging the narrative that RCTs are infeasible.

RANDOMISATION PRESERVED

Causal inference maintained. Treatment effects reliably estimated.

LOWER COST & BURDEN

Registry infrastructure replaces expensive standalone trial setup. Up to 10x cost reduction vs. conventional RCT.

REAL-WORLD POPULATION

Broad, less-selected patient populations reflecting routine clinical practice.

KEY MESSAGE

R-RCTs combine the methodological rigor of randomization with the reach and efficiency of clinical registries — the gold standard for real-world evidence generation.

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CARDIOLOGY R-RCTs IN ACTION

WHY REGISTRY-BASED RANDOMIZED TRIALS DELIVER UNMATCHED EVIDENCE

INTRO ROW

THE SWEDEHEART REGISTRY PLATFORM — SWEDEN

National cardiac registries (SWEDEHEART / SCAAR) enable seamless recruitment, randomization, and long-term follow-up of real-world patients — at a fraction of conventional trial cost.

TRIAL CARD 1

iFR-SWEDEHEART (2017) — DIAGNOSTIC DEVICE

Compared iFR vs. FFR to guide PCI. Registry-based enrollment via SCAAR. 2,037 patients across Sweden, Denmark & Iceland. Published in NEJM.

RESULT: iFR non-inferior to FFR (6.7% vs 6.1% MACE at 12 months). **Less patient discomfort. Changed clinical practice globally.**

TRIAL CARD 2

INFINITY-SWEDEHEART (2024) — MEDICAL DEVICE

Compared DynamX bioadaptor vs. drug-eluting stent (DES) in PCI. **2,399** patients, 20 Swedish hospitals. Single-blind R-RCT using SCAAR registry. 5-year follow-up ongoing.

RESULT: Bioadaptor non-inferior at 12 months **(TLF 2.4% vs 2.8%). Landmark 6-12 month analysis: significantly fewer events with bioadaptor (HR 0.19, p=0.008).**

TRIAL CARD 3

ABC-AF (2025) — DIAGNOSTIC / RISK SCORE

Biomarker-based ABC-AF risk score vs. standard care in atrial fibrillation. **3,933** patients, 37 Swedish sites. Embedded in AURICULA AF national quality register.

RESULT: **Pragmatic R-RCT design enabled near-complete follow-up via national registries. Safety signal detected early — demonstrating R-RCT ability to protect patients in real time.**

BOTTOM SUMMARY ROW

BROAD POPULATIONS — Real patients, not trial-selected cohorts.

COST-EFFICIENT — Registry infrastructure cuts trial costs dramatically.

DECISION-RELEVANT — Outcomes that matter to HTA bodies and regulators.

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