



Beyond Websites:

mobile diagnostics, rules engines and social networks
for developing 'SMART' patients

- **technology enhanced version of DCCT / UKPDS**
- **what makes a SMART patient?**
- **practitioners can't afford to develop SMART patients**
- **SMART patients practice self-care & change behavior**
- **SMART patients offer efficiencies & improved outcomes**
- **extender platform & program design requirements**
- **SMART patient interventions as part of a Cycle of Care**
- **case study examples**
- **clinical trial results**
- **summary**

Measure

Understand

Act

Simplicity

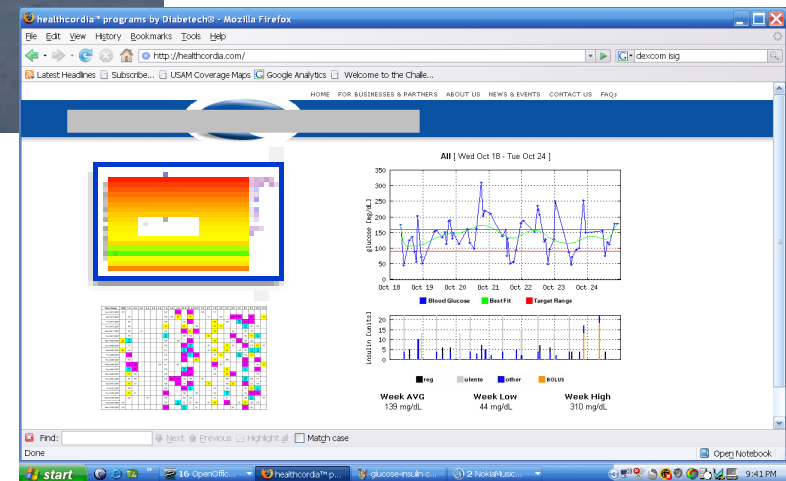
Reinforce

Teachable

S M A R T
p a t i e n t s



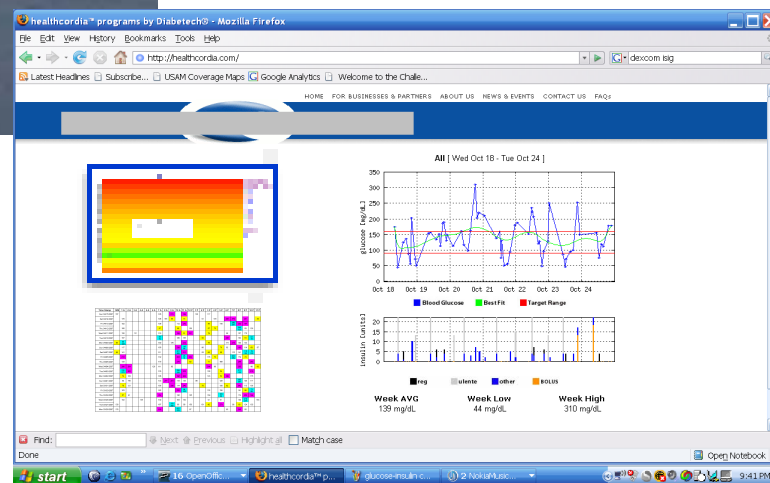
Nice Car.



Nice Charts.

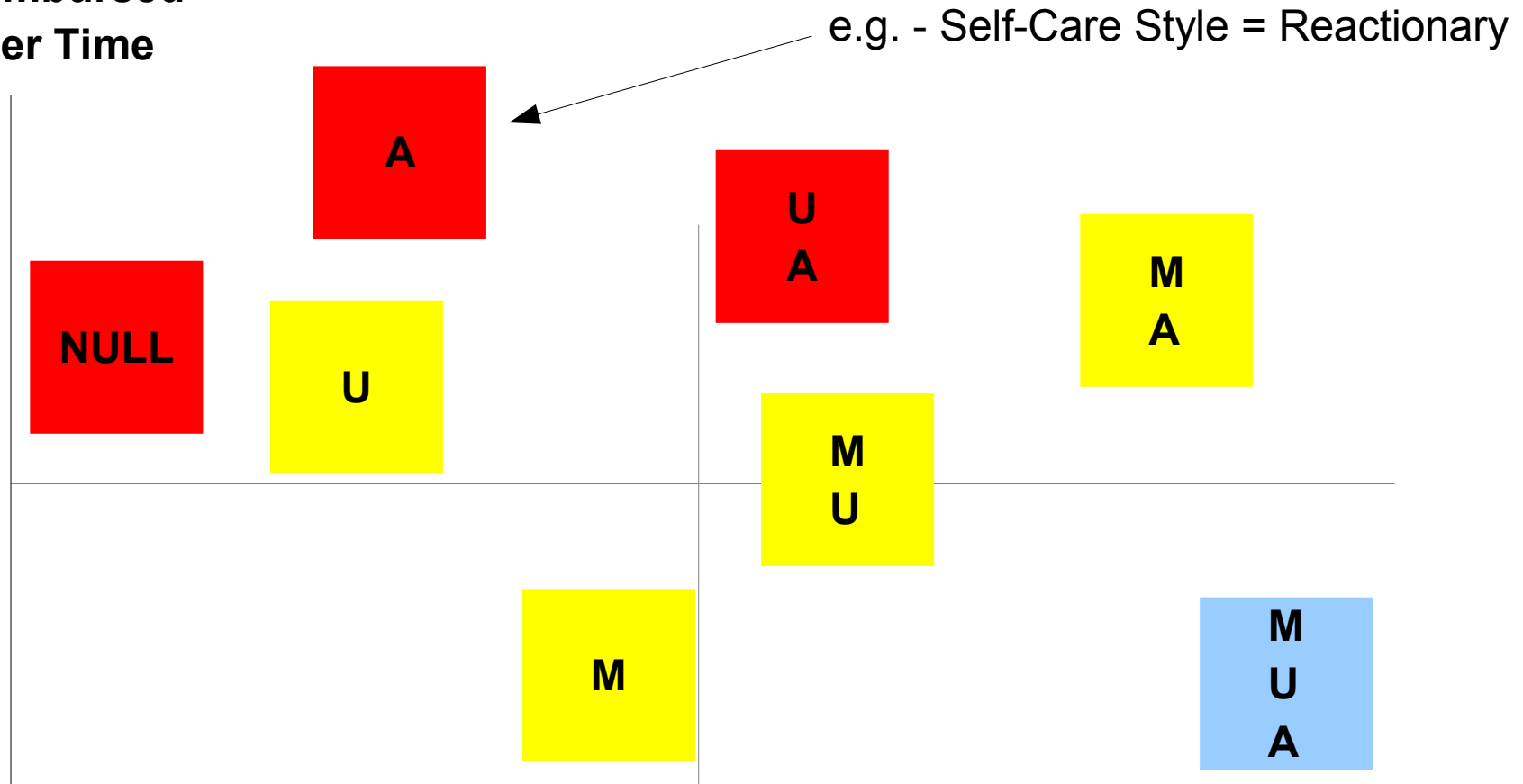


Nice Car.
Now What?



Nice Charts.

Non-Reimbursed Provider Time



SMART Patient

high touch

poor reimbursement
poor outcomes

medium touch

poor reimbursement
average outcomes

low touch

favorable reimbursement
superior outcomes

- **Providers:**

- No extra work – extender time
- Favorable reimbursement scenarios
- Streamlined clinical workflow
- Confidence in blood sugar logbooks
- Behaviors reinforced between visits
- Improved patient outcomes
- Fewer missed appointments
- Automatic feedback following prescribed changes to patient regimen

- **Payers:**

- Compliance verification
- Lots of data to tie interventions to corresponding outcomes
- Lower Cost of Care
- Measurable Return On Investment

- **Patients:**

- No extra work - simple tools
- Time savings
- Automated feedback
- Improved control (fewer severe hypos and extended hyperglycemia)
- Provider satisfaction
- Independence & Confidence
- Rapid & sustained attainment of therapy appropriate A1c's

- **Caregivers:**

- Peace of mind
- Time savings
- provider satisfaction
- Improved family relationships

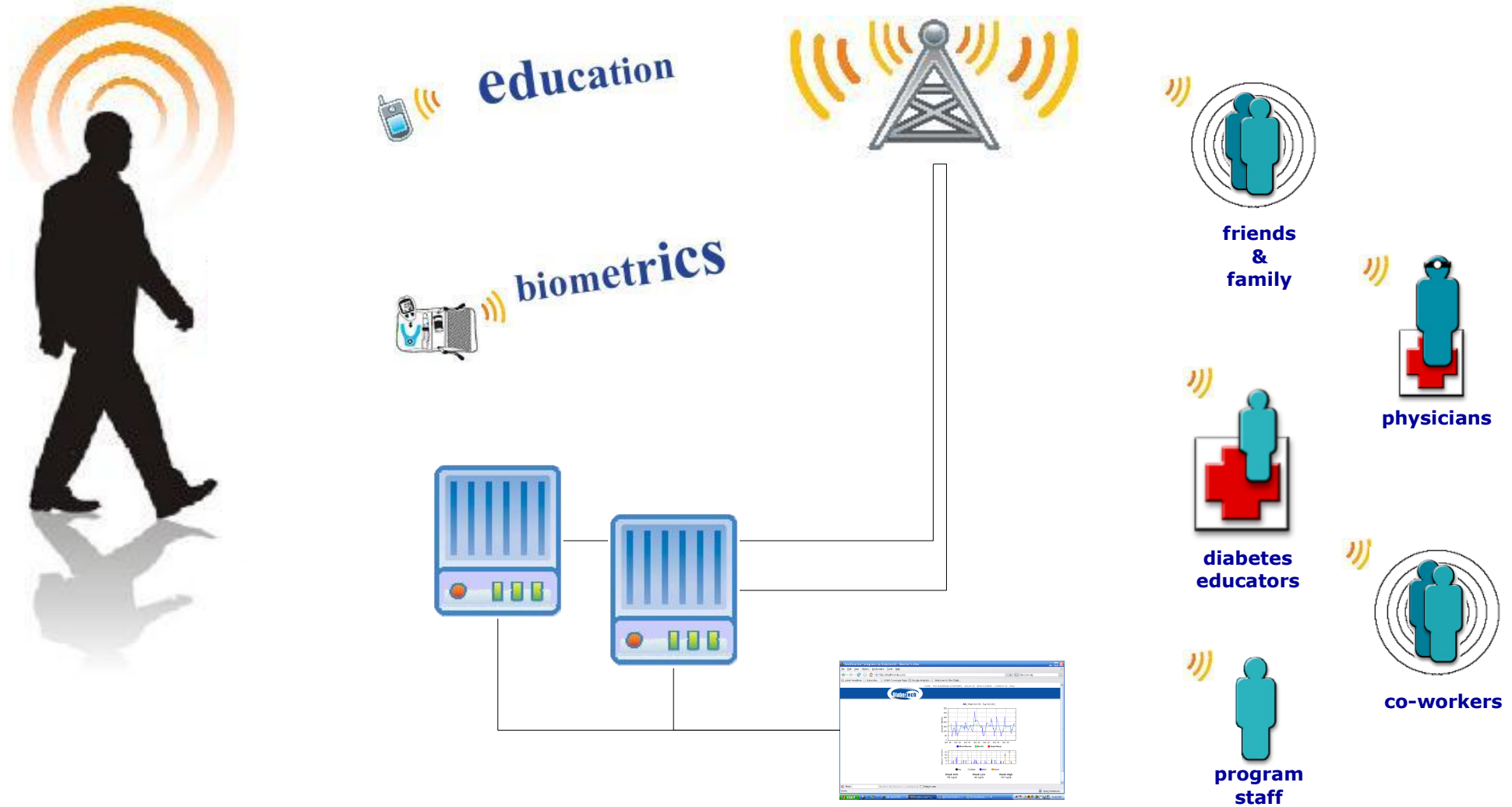
Step 1) Instead of a website, focus on desired outcomes & sustained patient participation

Step 2) Design a system to accomplish the outcomes objectives:

- Be mindful of your patient demographics (not everyone goes online!!!)
- Focus on outcomes that you can measure easily
- Build around scenario based protocols – not specific technologies
- No extra work! - Make sure data collection is accurate and transparent
- Keep it simple for everyone involved (patients, providers and caregivers)

Step 3) Develop program procedures including roles and responsibilities for your healthcare extender partner as well as your staff

- Understand the difference between education and medical advice
- Outsource 'customer support' functions to your extender
- Plan to incorporate educational interventions at the teachable moment



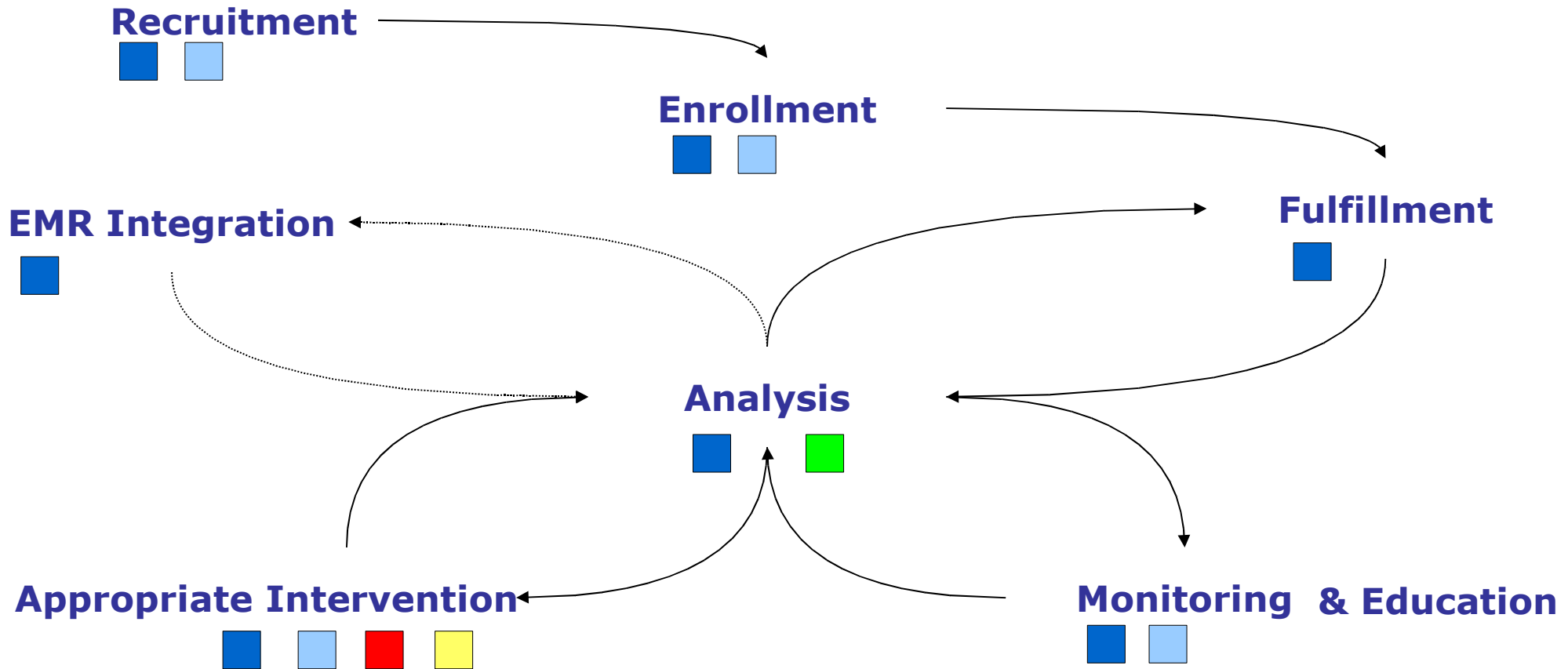
the SMART patient

mobile diagnostics

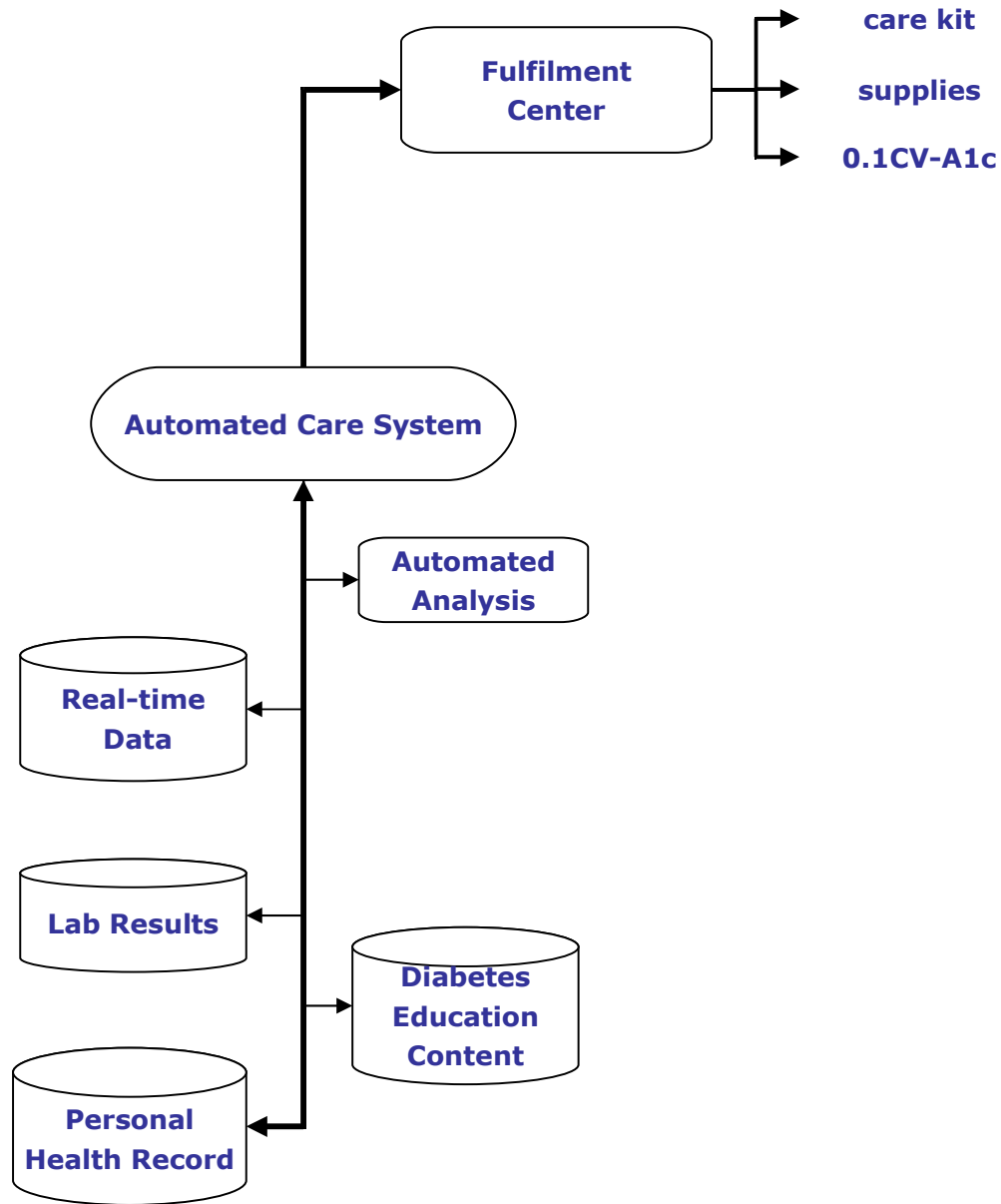
the social network

rules engine

Rapidly increase patient knowledge, proficiency and self-sufficiency



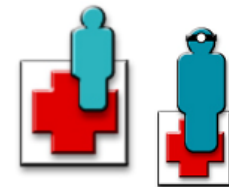
■ extender
 ■ SMART patient
 ■ provider
 ■ social network
 ■ payer



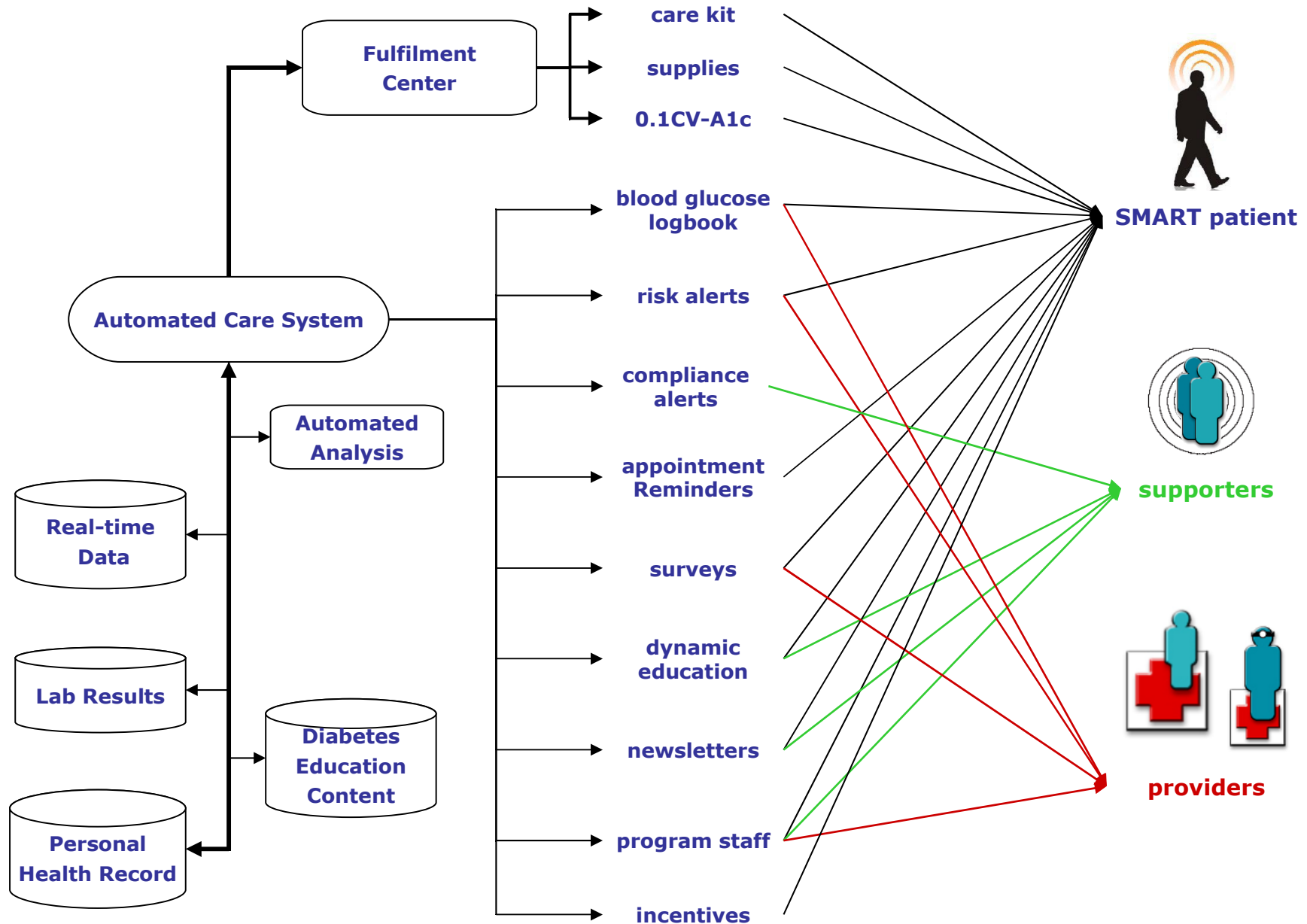
SMART patient

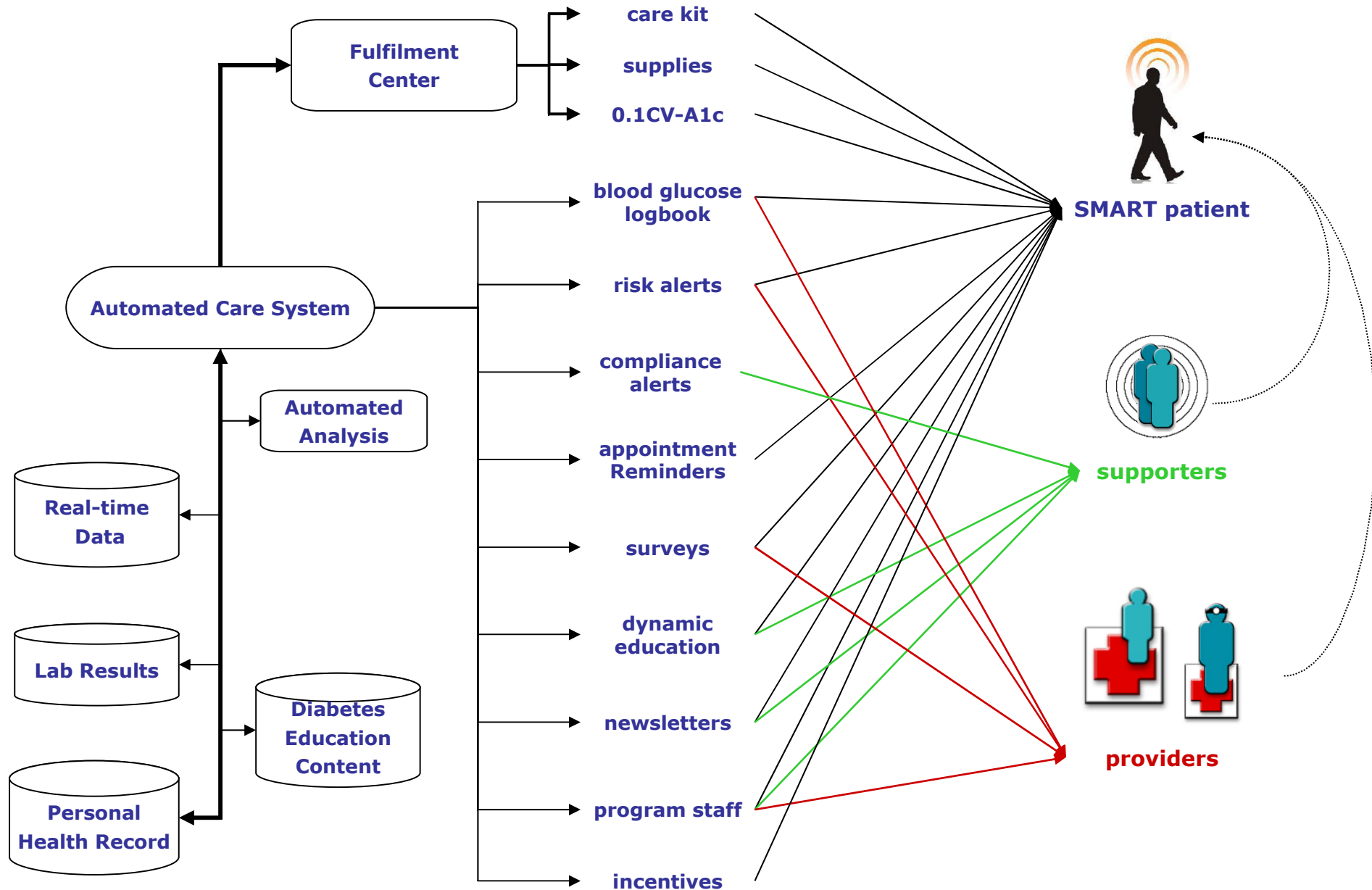


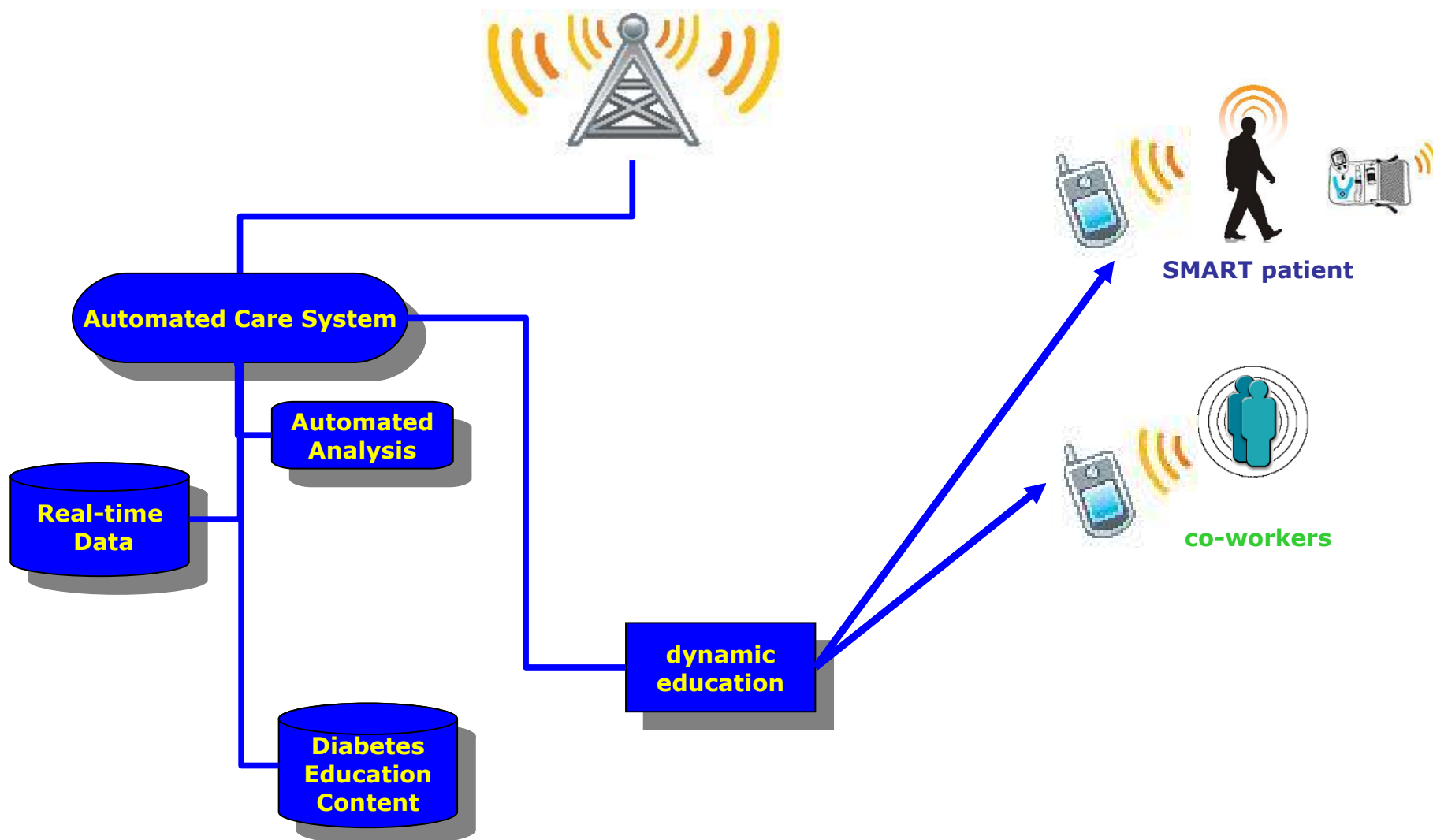
supporters



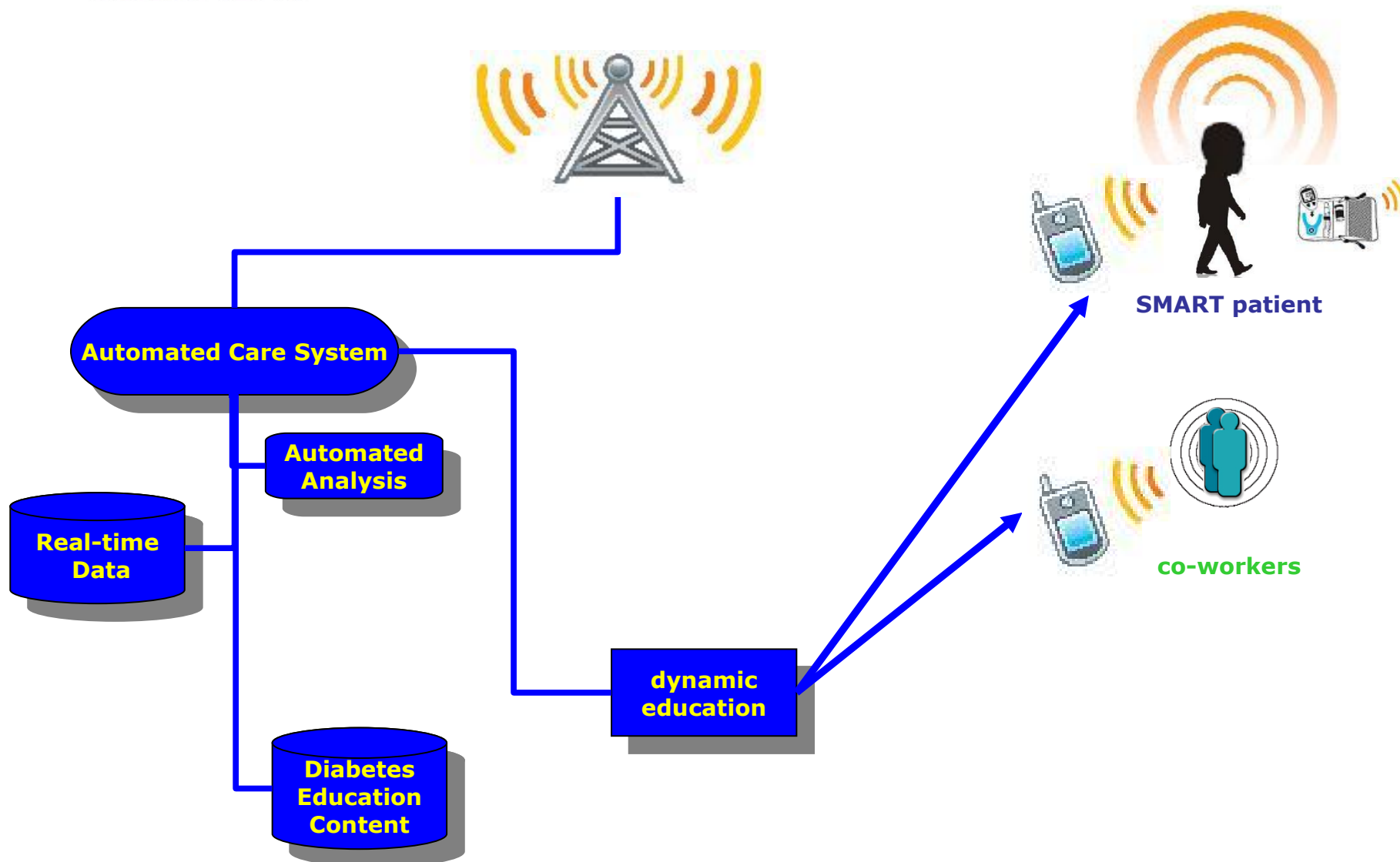
providers







intervention at the teachable moment... in real-time



intervention at the teachable moment... in real-time

intensive management

• **Limits w current care delivery**

- time & effort required for provider directed education involves significant non-reimbursed time
- training time, phone calls, faxed data charting, data review, patient follow-up
- Scheduled office visits are not always kept
- Scheduled office visits are not always efficient (no data or unreliable data)
- Gap in care between visits vs. Continuum of Care is unavoidable

• **Solution via Diabetes Health Care Extender**

- System engages physician based on exception-based risk algorithms
- Appt & medication reminders mean fewer missed appointments and meds
- Abnormal hemoglobins are detected and patient referred to physician
- A1c is accurate and available at time of office visit
- **NON-REIMBURSED TIME IS MINIMIZED**
- **PATIENT FEEDBACK FROM INFREQUENT SMBG CHECKS IMPROVES CONTROL**



Beta-cell preservation via intensive management

- **Limits w current care delivery**

- Lack of reliable feedback – no data available, incomplete and not timely
- Patient safety requires setting of high blood sugar targets
- Residual β cell function rapidly deteriorates
- Inordinate amount of staff time spent collecting, tabulating and contacting patient

- **Solution via Diabetes Health Care Extender**

- System engages provider staff based on schedule and/or risk algorithms
- Immediate provider feedback following frequently prescribed changes
- Dynamic education reinforces new patient training – accelerates proficiency
- **NON-REIMBURSED TIME MINIMIZED**
- **IMPROVED PATIENT SAFETY & SATISFACTION WITH PROVIDER**



insulin pump starts

- **Limits w current care delivery**

- Data intensive and inefficient
- Data often delivered in disorganized fashion or missing altogether
- Psycho-social family issues and inaccurate timestamps make it difficult to trust data

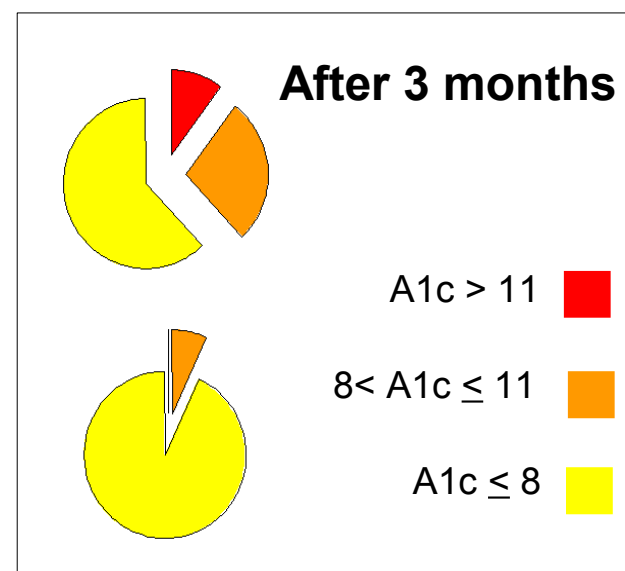
- **Solution via Diabetes Health Care Extender**

- Data automatically collected and appended to personal health record
- Data is from the registered meter with accurate timestamps managed by atomic clock
- Both patient and provider do nothing extra in order to work from the same logbook
- Resultant blood glucose levels following prescribed changes are available to the team
- Manual tabulation and patient communications are more efficient
- Skilled personnel spend time conversing & educating patient vs. record keeping
- **NON-REIMBURSED TIME MINIMIZED**
- **IMPROVED PATIENT SAFETY & SATISFACTION WITH PROVIDER**



Hypothesis: Technology Enhanced Diabetes Social Support Networks May Improve Blood Sugar Control in Patients with Type 1 and also Type 2 Diabetes.
Non-Randomized, No Control, Interventional, Behavioral & Educational

- A1c at enrollment and every 90 days
- SMBG as prescribed
- Surveys & Education
- Hemoglobin screening
 - N = 1/31 (3%) variant hemoglobin
- No changes to prescribed therapy
- Incentive for participants
- Participation incentive
- Automated blood sugar collection device
- Rules Engine for educational messaging
- Social Network for reinforcement
- Duration = 12 months
- type 1 adults
- type 2 adults



Result:
N = 1/31 (3%) found w/ variant hemoglobin & referred to physician

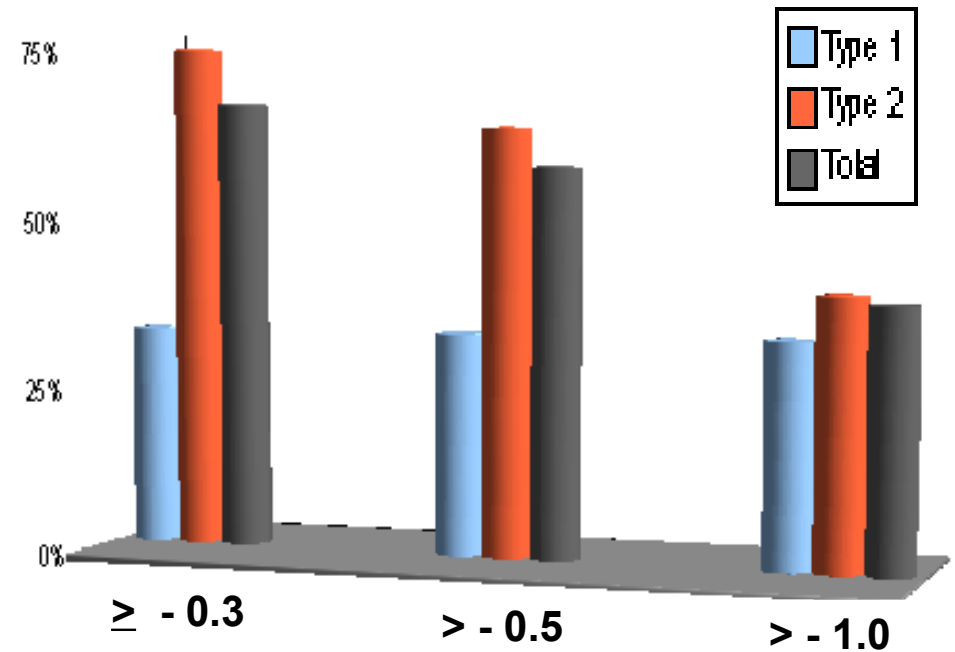
Preliminary results after 9 months

	Total	Type 1	Type 2
Total Patients	31	6	25
Avg Entry A1c	7.35	7.32	7.36
Avg Exit A1c	6.55	6.75	6.51
Net Change	-0.79	-0.57	-0.85

A1c Segmented by Reduction vs. Increase

	Avg A1c Reduction	Avg A1c Increase
Type 1	-1.35 50% 3	0.18 50% 3
Type 2	-1.10 84% 21	0.48 16% 4
Total	-1.18 77% 24	0.36 23% 7

% of Population Experiencing A1c Reduction



T1 n = 2
 T2 n = 19
 All n = 21

T1 n = 2
 T2 n = 16
 All n = 18

T1 n = 2
 T2 n = 10
 All n = 12

Simplicity Act
Teachable
Reinforce
Measure

Technology Enhanced DCCT & UKPDS Style Intervention is Feasible

- significant reduction in A1c's observed
- sustained participation is assured based on 90%+ patient satisfaction rating
- education based on dynamic assessment of patient record
- education delivered at the teachable moment... in real-time
- blood glucose meters can play a greater role as an intensive management tool

Extenders Reduce Non-Reimbursed Practitioner Time

' SMART ' Patients Enjoy the Benefits of a Cycle of Care vs. Episodic Care

Practitioners Are Using Extender Platforms to Develop SMART Patients Today

**Researchers Can Now Use Extender Platforms to Study & Optimize
Scenario-Based Intervention Algorithms
To Improve Outcomes and Enhance Clinical Workflow**

References:

- 1 **Wireless Diabetes Management System; Poster Presentation 2003 Diabetes Technology Society: December 2002 – April 2003; Stephen Ponder MD CDE, Driscoll Children’s Hospital with support from Diabetech.**
- 2 **Analysis: Transfer of the Data Collected by the Patient to the Health Care Providers: Problems and Solutions, Jan Maria Wojcicki, Diabetes Technology & Therapeutics. Apr 2005, Vol. 7, No. 2: 248-252**
- 3 **Diabetes Care 26:1475-1479, 2003 Modem Transmission of Glucose Values Reduces the Costs and Need for Clinic Visits, H. Peter Chase, MD1, Jerusha A. Pearson, BA1, Clare Wightman, BA1, Mary D. Roberts, MD1, Adam D. Oderberg, BA1 and Satish K. Garg, MD**
- 4 **“Artificially Low Hemoglobin A1c in a Patient with High Hemoglobin F” Daniel E. Sabath, MD, PhD, CLINICAL DIABETES, VOL. 18 NO. 4 Fall 2000 - CASE STUDIES**
- 5 **"How to reconcile high blood glucose with normal A1C", DOC News, June 1, 2005, Volume 2 Number 6 p. 5, Mary Ann Emanuele, MD, Nicholas V. Emanuele, MD**

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