

The Third Annual Disease Management Summit

Next Generation Disease and Care Management: The Role of Technology

March 20, 2003
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Survey Methodology: Interviews, Literature Search

Source (Function)	Count	Organization & Contact Name
Healthplan (Actuarial, Medical Mgmt, Epidemiology, Medical Economics)	11	Humana, BCBS-SC, HealthNet, BCBS-FL, PacifiCare, BCBS-MN, BCBS-MA, Tufts Healthplan, Aetna, Harvard Pilgrim
Disease and Population Health Management Vendors	7	Qmed, Accordant, StatusOne, American Healthways, Active Health Management, Life Masters, Health Dialog
Technology Vendors	13	Resolution Health, Quodvax, StatusOne, MEDecision, McKesson Health Solutions, Ingenix, Landacorp, Medstat, MEDAI, Pharmetrics, IHCIS, Medical Scientists, VIPS
Thought Leader (DMMA, Venture Capitalist, Epidemiologist)	6	Dr. Victor Villagra, Al Lewis, Wilson Research, Innocapital, Bedrock Capital, Galen Associates
Employer/TPA (HR Benefits, Employer Coalition)	3	Southwest Employer's Coalition, Ohio Teachers, Wausau Benefits
Subtotal	40	

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Does Your Organization Face Any of These Issues?

Ranking

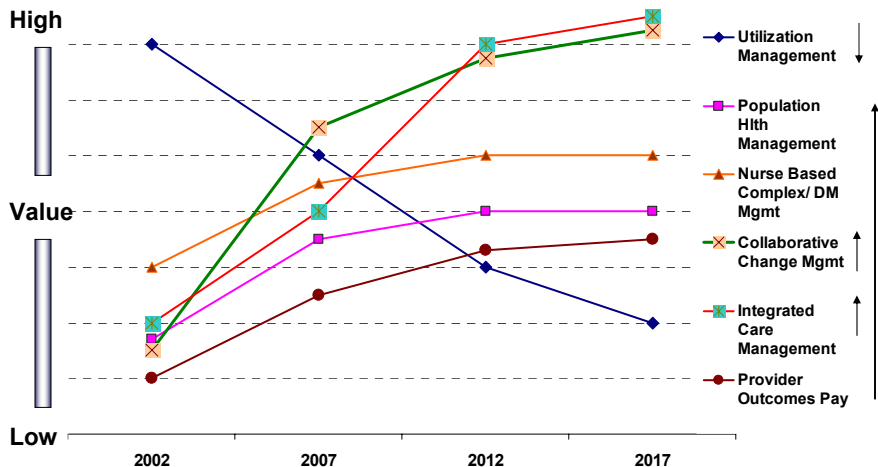
Concern

- _____ Returns on clinical resources and investment
- _____ Effective patient targeting and early intervention
- _____ Greater nurse productivity
- _____ Aligning clinical resources to patient condition
- _____ Efficient workflow (cross program coordination)
- _____ Managing patients with co-morbidities
- _____ Patient & provider compliance
- _____ Outreach, communication and connectivity
- _____ Integrating DM workflow with existing legacy systems
- _____ Improved outcomes reporting
- _____ Other (State:) _____

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Healthplan Care Management Strategy & Adoption



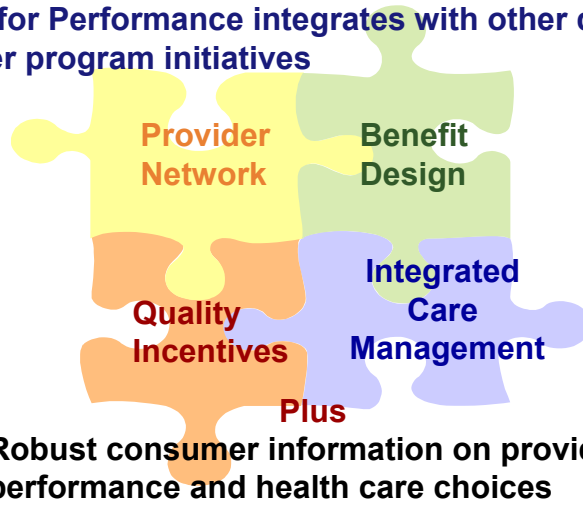
Source: Med-Vantage 2002 Survey of 40 Payers and Vendors, Gartner Research ("Patient Care Mgmt," 9-02), Forrester Research (Proactive Medical Mgmt 2001)

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Aligning Provider Incentives with Care Management

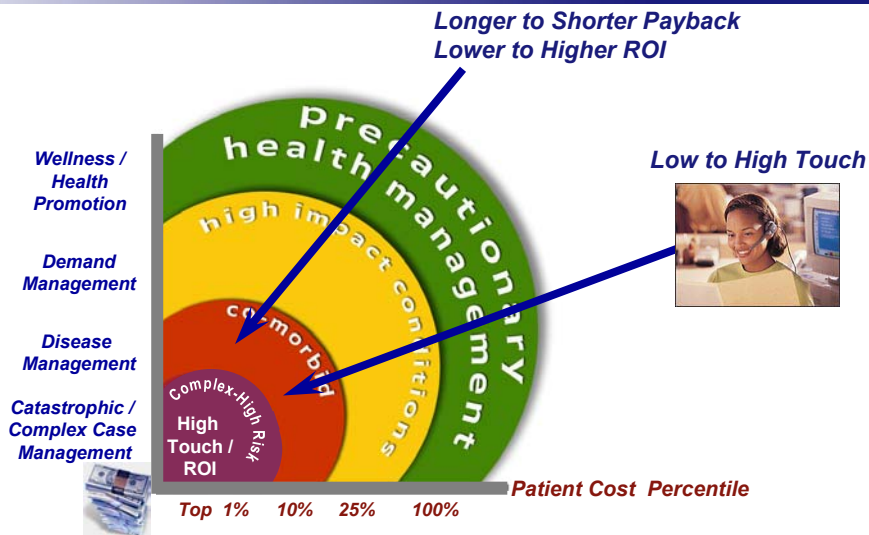
Pay for Performance integrates with other delivery and payer program initiatives



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Integrated Care Management Focus

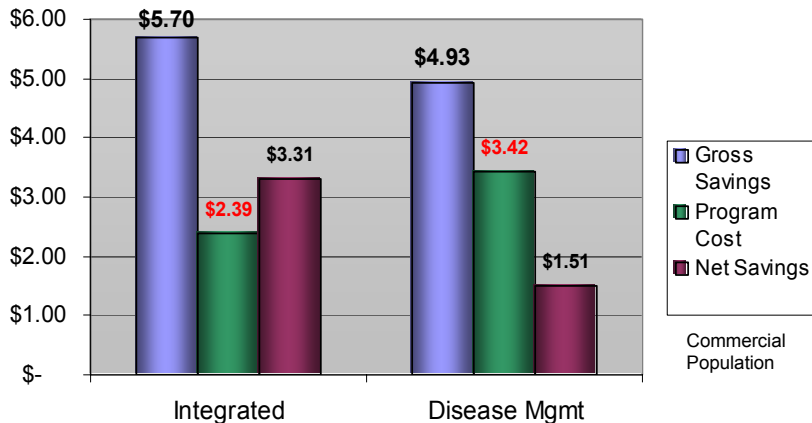


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Higher Return with Integrated Care Management

Integrated Care Programs Can Increase Gross Savings by 16% and Reduce Admin Costs by 30%



Sources – (1) MedVantage research, Health Dialog client experience (Highmark), Goetzel, Ron Z.; Juday, Timothy R.; and Ozminkowski, Ronald J. Worksite Health, Association for Worksite Health Promotion's (AWHP) Summer 1999, 6(3), 12-21. Al Lewis, DPMC.

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CMIT Defined

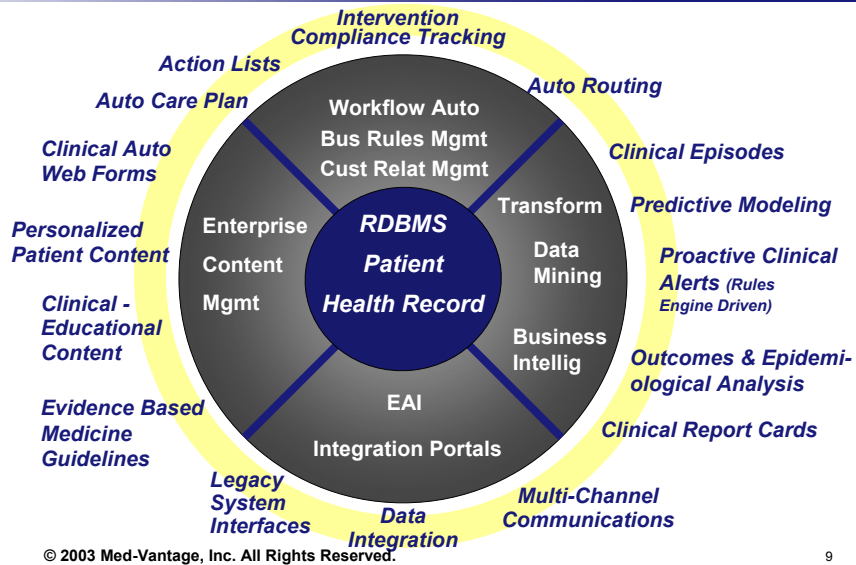
“Care Management Information Technology integrates data, and provides intelligence, automation, communication, and reporting to improve the administration of the care process for patients, physicians, and health administrators.”

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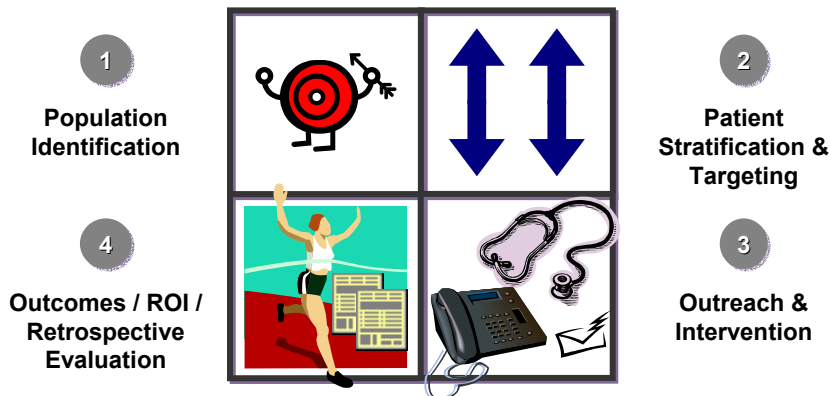
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Care Management Delivery... Technology Attributes

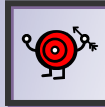


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High Risk Patient Management



Population & Patient Identification



Business Needs

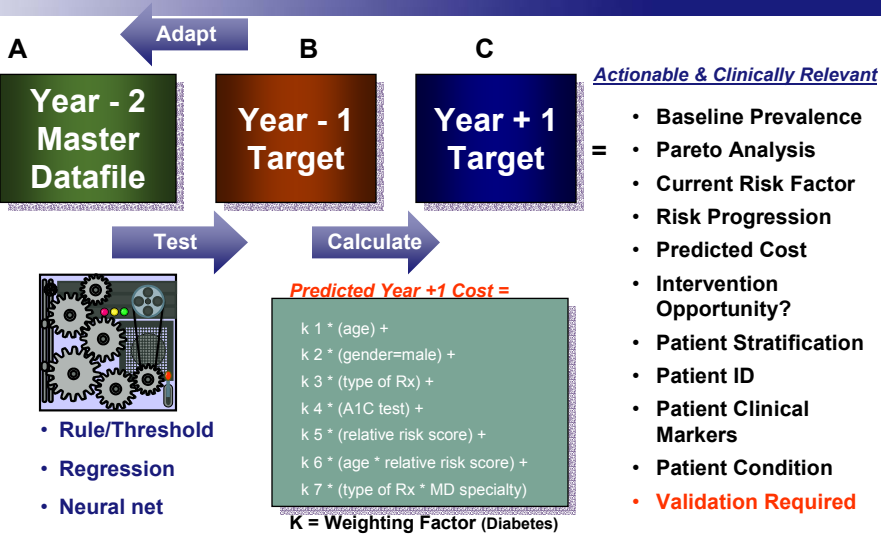
- Regression, Neural Net tools or Combination
- Additional data to improve predictive accuracy
- Stratify patient risk using dominant & secondary conditions
- Stratify cohorts with high present costs (top 5%)
- Stratify cohorts with high risk of future utilization (top 10%)
- Results must stratify cohort where intervention has high impact, relevance, and return on effort.

Technology Requirements

- Data Mining
- Predictive Modeling
- Business Intelligence
- Decision Support (Reporting)

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Predictive Modeling



Source: Adapted from Michael Cousins, et al., "An Introduction to Predictive Modeling for Disease Management Risk Stratification," Disease Management, Volume 5, Number 3, 2002. 12

Patient Risk Stratification Report



Member ID	Inferred Condition	Age	Sex	Months Enrolled	Relative Risk Score (RRS)	Opport. Score	Actual Costs (PTD)	Pred Costs (RRS) Next 12 Months	Prob of >1 Hospital Admit (Next 12 Months)
49493826	CHF/COD	61	M	7	15.8	7	\$	\$	75%
6874143	Co-Morbid	32	M	12	8.72	8	\$	\$	85%
168279008	CHF/Diab	47	F	3	6.34	5	Work in Progress – Still Need Actionable Information Regarding Patients		
98987652	Co-Morbid	48	M	4	5.63	3			
49493826	CHF	56	M	9	4.21	2			
148481478	Co-Morbid	55	F	18	3.41	2			
732508625	Asth/CHF	54	F	8	2.89	2			

Patient Risk and Opportunity Stratification Report (By Business Line, \$Threshold)

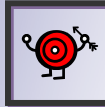
This report shows patients sorted by relative risk stratification category. Patients are also sorted by highest to lowest opportunity scores. The report shows prospective savings associated with medical intervention (based on opportunity score), patient opportunity and risk scores, and the probability of the patient experiencing an acute exacerbation (hospital stay) in the next 12 months.

Results Reporting for Population & Patient ID



- ▶ [Population Disease Prevalence Report](#)
- ▶ Predictive Modeling ROC (Receiver Operating Characteristic) Report
- ▶ Prospective Population Savings Report by Condition
- ▶ Prospective Pareto Analysis Savings Report
- ▶ [Patient Risk Stratification Report](#)
- ▶ Patient and Population Risk Factor Trend Report
- ▶ Population Clinical Compliance Report by Risk Score

Patient & Population Identification



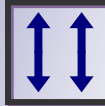
Challenges

- Proof in concept
- Different methodologies for objective (actuarial vs. care management)
- Positive Predictive Value (PPV) – trade-offs between specificity and sensitivity
- False-positives: accurate identification of patient risk level / condition
- Predictive power of R2
- Insufficient data or population experience

Limitations

- Avoid focus on disease states, focus on co-morbid
- Rules based models suffers from bias & regression to mean
- Validation required (nurse survey intake)

Stratification & Targeting Requirements



Business Needs

- Survey intake designed for co-morbid
- Stratification determines “light” or “heavy” lifting by care nurses and type of intervention required
- PHR results populate care plan, linked content
- CRM features to support enrollment mailing
- Enterprise & outside access to PHR
- Patients can self-report results to linked PHR

Technology Requirements

- RDBMS
- Enterprise Application Integration (EAI)
- Business Rules Engines (BRE)
- Patient Registry / Patient Health Record
- Business Intelligence
- Proactive Clinical Alerts (BRE)
- Multi-Channel Communication
- Integration Portals

Patient Health Record Value



Patient health records (PHR) increase nurse productivity and improve care coordination

- Demographic & contact information
- Information regarding physicians caring for patient
- Patient specific alerts
- Patient action lists
- Initial care plan generation
- References to patient standards of care
- References to supporting evidence based medicine literature
- Patient history
- Patient risk condition
- HRA & functional assessment survey intake & results view
- Patient cost tracking
- Tracking of communication, intervention, clinical note taking, updates to care plan

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Initial Outreach... Role of Technology



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Summary of Early Patient ID Approaches



Method	Cost	Response Time	Accuracy
Admin Data (Predictive Modeling)	Low	Rx - High Claims - Fair	Fair
Member Service Nurse Helpline (CRM)	Fair	High	Fair
MD Patient Registry (Medical Record)	Low	High	High
Member Reported HRA/PHR Care Manager (RN) HRA	Low High	High Fair	Fair High
Recruitment through MDs	High	Low	High

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Stratification and Targeting



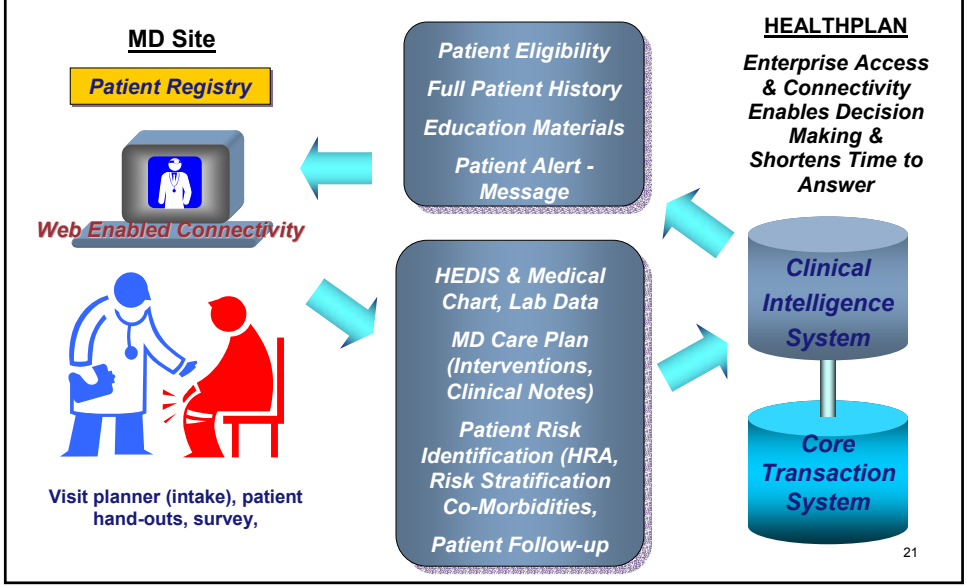
Challenges

- Better alignment of patient condition with clinical resources
- Enrolling and disenrolling the right patients
- Early identification
- Single condition driven stratification process not equipped for co-morbid

Limitations

- Patient & physician support
- Industry has not refined automated tools and content when mapping intervention for patients with multiple co-morbidities.

Point of Care MD –Healthplan Connectivity



Enterprise Patient Registry for MDs with Healthplan Connectivity



User's Guide | Log Out

Home Care Management Patient Data Reports HRA Surveys Conditions|Measures Administration DS Admin

Sites

DocSite - DM

Patients

Active

➔ Add new patient

Jones, Sammy

O'Reilly, Kimberly

Rosenbluth, Peter

Roxbury, Peter

Thompson, Rebecca

Claim Detail (demo) [Edit](#)

View Patient Summary

Patient Search

Select a search mode

Last Name

ID

➔ Search

You may perform a search by entering as many letters of the last name as you like or the PatientPlanner Patient

Patient Detail

Demographics

First Name: Kimberly SSN: 587-11-3025

Middle Name: Medical Rec #: 123456

Last Name: O'Reilly Date of Birth: 10/6/1971

Address Line1: 610 Castlewoods Boulevard Gender: Female

Address Line 2: Patient Status: Active

City: Brandon Race: White

State: MS Zip: 39047 First Language: English

Email: Primary Care Site: DocSite - DM

Phone: 601-992-6981 First Visit Date: 1/2/2003

Alt Phone:

Emergency/Care Giver Contact:

➔ Edit Patient Demographics

Allergies:

Medications:

First Measure Date: 1/27/2003 Last Measure Date: 1/27/2003

Patient Conditions

Condition
Edit Delete Depression
Edit Delete Diabetes

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Previous Visit Comments

❑ Dashboard view

❑ Information organized by relevant tabs

❑ Pre-populated data fields

❑ Summarized results for quick reference

Provider Alert – Patient Exception Report



LifeMasters Patient Exception Report: 5-6-99

TO: Lydia Test, M.D. Ft. Home Over, John Clark Address: 1234 State St. San Francisco CA 94010 Home Ph: 650 111-1111 Work Ph: 202/7102 (age 71) Primary RN: Chris Ruggiero, R.N. SPh: 211-182 Weight: 180 Allergies: strawberries – rash		FAX No: (650) 673-7197 Medications (Self Reported) Capoten – 12 5MG BID Lipitor 40MG – 1 Unit MIO ODAM, MIO ODPM Zocor – 40MG HS Norvasc – 5MG BID Lasix – 40MG BID Lanoxin – 0.125MG QD Aspirin Entero Coated – 325MG QD Inobur – 60MG QPM Benazepril HCl – 40MG QAM Auger 81 – 81MG QAM Daily Multivitamin + Iron/Calc – 2 Units QAM H-Dur – 25MG QD
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REASON: Systolic Blood Pressure > 210 mmHg; Weight Gain > 6lbs in one week

This is a Semi-Urgent report.

Clinical Summary: Patient reports he is unable to sleep due to SOB in reclining position. He also reports increased DOE over the last two days, but denies any chest discomfort. He has reported eating an increased sodium diet over the last 4 days. Patient reports swelling in both of his lower extremities up to his knees. States that he is taking his medications as ordered.

Education: Reviewed with patient the importance of (1) Notifying MD of worsening Sv. (2) Limiting high sodium foods, strategies for low sodium meals.

Reported By: Chris Ruggiero, RN

Please FAX back to LifeMasters Supported SelfCare at 800.777.5387 or call 800.777.1307 for questions

Physician Action
 Acknowledged Patient Call Office Visit

Patient Demographic Information

Medications

Vital Sign Information
 Biometric monitoring (not applicable)

Comorbidity Tracking

Alert Severity

Nursing Note

Results Reporting for Outreach Intervention



- Patient & Provider Contact Fulfillment Report
- Patient Registry Report
- Patient Health Record Report (Includes Risk Profile)
- HRA Intake Summary Results Report
- Care Program Patient Participation Report
- Nurse Caseload Report
- Compliance Alert Follow-Up Report
- Changes in Patient Condition and Risk Factor Report
- Care Coordination Report
- High Cost Claimants Report

Outreach and Intervention



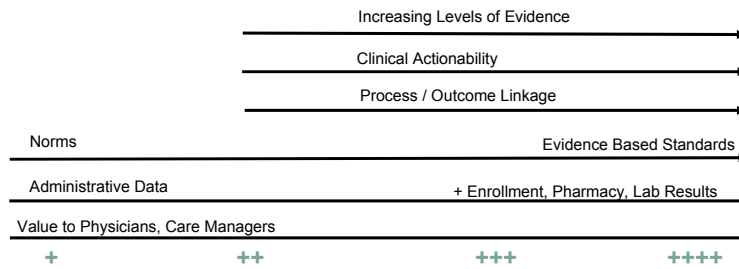
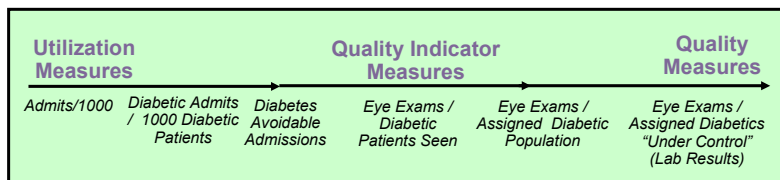
Challenges

- Informed and educated patients (personalized education, self-care)
- Patient compliance, patient-physician-family participation
- Physician support
- Nurse productivity & workflow; stove-pipe processes
- Efficient coordination of co-morbid patients
- Current disease state focus of vendor applications

Limitations

- Multi condition, clinical guidelines not widely available for co-morbid conditions
- Alert rules based on co-morbidities
- E-reimbursement limits MD use of PHR
- 15% Patient Adoption of electronic PHR

Efficiency vs. Quality Measures



Outcomes / ROI / Retrospective Evaluation



Business Needs

- Defensible ROI and outcomes studies with industry standard methodology
- Comprehensive, process and outcomes measures reporting
- Robust financial, Rx, and utilization reporting
- ROI reporting with snapshot savings results
- Improved validation with normative benchmark comparisons

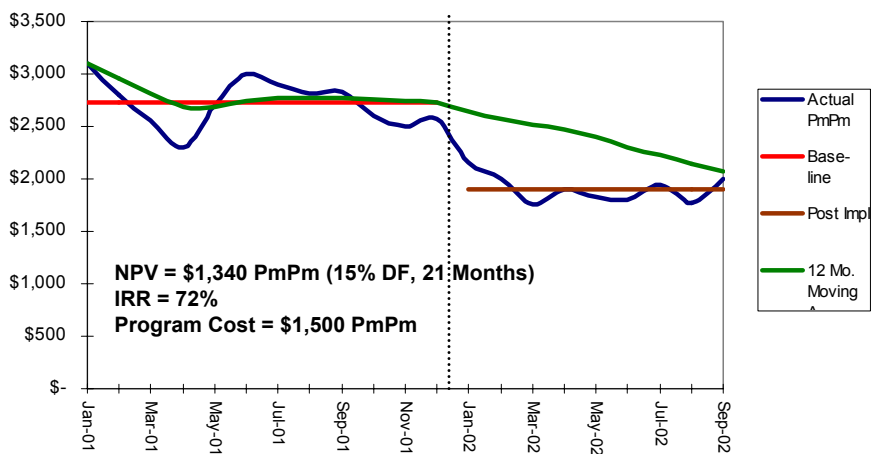
Technology Requirements

- RDBMS
- Patient Registry / Patient Health Record
- Data Mining
- Business Intelligence
- Decision Support Reporting

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Pre and Post Baseline Analysis



PmPm Expense Trend Report (By Business Line, High Risk Population)

This report shows the value and impact of intervention for a high risk patient population group on a ppm basis.

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Retrospective Evaluation Reports... Examples



- DM Program Patient Satisfaction Report
- Medical Best Practice Report by Provider
- Process Measures Review Reports by Disease Condition
- Return to Work Evaluation Report
- Functional Status Report
- Patient Care Intervention Trend Report (Using Cohort Design)
- ROI Simulation by Clinical Intervention Program Report
- DM Program Outcomes Report by Key Compliance Measures
- Program Selection Bias Analysis Report
- Cost and Utilization Performance Reports by DM Program
- Pareto Analysis Report of Historical Experience
- Monthly DM Savings Report

Outcomes Measurement



ROI = Improved Clinical Outcomes

- Reduced hospitalization (efficiency)
- Reduced ER utilization (efficiency)
- Reduced surgeries (efficiency)
- Reduced complications (safety, efficiency)
- Reduced outpatient procedures, imaging (efficiency)
- Improved use of effective Rx, other treatments (quality)
- Improved compliance with treatment modalities (quality)
- Improved functional status, productivity (quality)
- Improved clinical lab measures (HbA1-C, quality)
- Improved self mastery, self-esteem (quality)
- Improved satisfaction with care (market share)

Challenges with Outcomes Measurement



Challenges

- Credible results; quantifying, proving, and validating ROI and outcomes
- Epidemiological analysis
- Personnel with advance degrees in statistics
- Vendor contract reconciliation

Limitations

- Commercial software unavailable to perform epidemiological analysis

Bottom Line: Investment in CMIT = Success

Translation

- Healthplan market leaders are making significant investments in care and disease management information technology
- Hits healthplan sweet spot: high perceived value and return
 - Reduced G & A (-1% to -1.5%) , Lowered medical loss ratio (-2 to -4%)
- Interactive patient self-management provides highest opportunity
 - Patient self-care and web adoption will grow
- Focus is on Analytic/BI, BRM, ECM, and EAI applications
 - Required upgrades/replacement of current legacy investments

Bottom Line: Proceed with Caution and Due Diligence

Challenges

- Required: care management strategy
- Competing IT priorities
- Elusive business case: demonstrating ROI
- Legacy system integration requires significant customization
- Potentially disruptive process improvement & design
- Data security and privacy (addressed by HIPAA)
- No panacea: must balance technology with human intervention
- Great promise, but low web adoption (patients & physicians)
- No reimbursement for physician e-work

