

Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure 1. Core Process Attributes of TPM Compared With r-TBC

Intermountain Healthcare Primary Care Principles	TPM Core Process	Structure Enhancements Over Time (MHI + PPC)	TBC Core Process
Personal Relationship With Physician	<ul style="list-style-type: none"> Established relationships with PCP Autonomous physicians deliver care, delegate tasks to support staff Patients email access to PCP 	<p>Leadership & Culture:</p> <ul style="list-style-type: none"> Complexity of practice population assessed Physician Champion Assigned Mental Health normalized as routine whole person care Training all staff in (MHI and PPC) TBC team approach for prevention and chronic disease management 	<ul style="list-style-type: none"> Engaged physicians deliver care through coordinated teams Team reaches out to patient and family for follow up Physician introduce MHI/PPC and prepare family for, TBC Physician discuss with patient and family assessment results, treatment options, and activates team
Timely Access	<ul style="list-style-type: none"> Competing practice demands Lack of mental health specialty resource Operations provide practice management efficiencies Common EMR Limited care management support 	<p>Patient Team Workflow:</p> <ul style="list-style-type: none"> Standard work flow designed with defined team roles and CPM protocols for EB care Mental health specialists and care managers hired into practice Chronic disease targeted groups identified Individual care plans designed and executed 	<ul style="list-style-type: none"> Consistent use of screening and assessment tools to match complexity of patient with appropriate level of coordinated team care Patient and family engaged in care planning, self-management and outcome tracking Patients receive health education, solution focused therapy, and medication consults onsite
Evidence-Based (EB) Practice	<ul style="list-style-type: none"> MHI, diabetes, depression and other CPM education available Tools difficult to implement Independent CME attended Physician ad hoc participation in clinical program development teams 	<p>Information System:</p> <ul style="list-style-type: none"> Registry reporting tools designed and maintained High risk patients identified CPM measures coded in EMR EMR alerts and patient reports Electronic prescribing Clinic wide process and outcome goals tracked 	<ul style="list-style-type: none"> Team communicates through EMR Registries and data used to track improve process goals and patient outcome Complex case conferences and education at practice sites Telehealth available in some sites
Improved Quality	<ul style="list-style-type: none"> Independent physician clinical quality excellence projects required part of compensation Review individual patient experience surveys Clinical integration through clinical programs Disease specific performance goals 	<p>Operations and Financing</p> <ul style="list-style-type: none"> Operational champion assigned MHI scorecard and NCQA levels 1-2-3 measured yearly* Staffing ratios, recruiting and budgets aligned with practice TBC target goals Physician and MHI providers review patient experience surveys 	<ul style="list-style-type: none"> Practice operations manager holds routine team meetings to track TBC progress and identify gaps in care and implementation challenges Team huddles and hallway consults Staff participates in yearly system wide MHI and PPC conferences and training on TBC
Affordable Care	<ul style="list-style-type: none"> Volume based productivity goals Manage budget constraints Comply with reporting regulations Physician refers to specialty care and hospital based care as needed Fee for Service reimbursement 	<p>Community Resources:</p> <ul style="list-style-type: none"> Health Plan partners with Intermountain Medical Group to incentivize physician to participate in team care Practice teams partner with internal departments and external community organizations to meet patient/family needs 	<ul style="list-style-type: none"> Care manager link patients and families with community resources Peer support groups are available at some practice sites Physicians refer specialty care off site as determined by assessment, CPM protocols, and team consult, with care manager facilitated transition and follow up plan

eFigure 1 (continued)

Abbreviations:

MHI = Mental Health Integration

PPC = Personalized Primary Care

TBC = Team-Based Care

TPM = Traditional Practice Management

NCQA = National Committee for Quality Assurance

EMR = Electronic Medical Records

MH = Mental Health

***NCQA ACO Accreditation Levels**

Level 1: Organizations beginning the transformation and providing the basic infrastructure and some of the capabilities to meet the triple aim of better patient experience, better health and lower per capita cost. The length of status is 2 years.

Level 2: Organizations demonstrating well-established capabilities outlined in the standards to meet the triple aim of better patient experience, better health and lower per capita cost. The length of status is 3 years.

Level 3: Organizations meeting Level 2 criteria AND demonstrating strong performance or significant improvement in performance measures across the triple aim of better patient experience, better health and lower per capita cost. The length of status is 3 years.

Reference:

<http://www.ncqa.org/programs/accreditation/accountable-care-organization-aco/aco-accreditation-levels>

eTable 1. Definitions of Chronic Conditions

Chronic Condition	Diagnoses (ICD-9-CM)*	Encounters (CPT)*	Exclusions
High Blood Pressure	360.42, 362.11, 401, 401.0, 401.1, 401.9, 402, 402.0, 402.00, 402.01, 402.1, 402.10, 402.11, 402.9, 402.90, 402.91, 403, 403.0, 403.00, 403.1, 403.10, 403.9, 403.90, 404, 404.0, 404.00, 404.01, 404.1, 404.10, 404.11, 404.90, 404.9, 404.91, 405, 405.0, 405.01, 405.09, 405.1, 405.11, 405.19, 405.9, 405.91, 405.99, 437.2	Outpatient visit with either: 99201-05, 99211-15, 99241-45, 99341-50, 99381-87, 99391-97, 99401-04, 99411-12, 99420, 99429, 99455-56	No documentation of renal transplant
Atrial Fibrillation	427.31	Inpatient admission with either: 3734, 3726-28	none
Coronary Artery Disease	410.xx, 411.0, 411.1, 411.81, 411.89, 412.0, 413.0, 413.9, 414.0, 414.01, 414.02, 414.03, 414.04, 414.05, 414.06, 414.07, 414.11, 414.80, 414.90	none	none
Heart Failure	398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9	none	none
Depression	296.2, 296.20, 296.21, 296.22, 296.23, 296.24, 296.25, 296.26, 296.3,	Hospital admission <i>or...</i> Emergency	none

	<p>296.30, 296.31, 296.32, 296.33, 296.34, 296.35, 296.36, 296.82, 296.90, 298, 298.0, 300.4, 309.1, 309.28, 311</p>	<p>Department Visit <i>or...</i></p> <p>Outpatient visit with either: 99201-05, 99211-15, 99241-45, 99341-50, 99381-87, 99391-97, 99401-04, 99411-12, 99420, 99429, 99455-56</p>	
<p>ICD-9-CM: The International Classification of Diseases, Ninth Revision, Clinical Modification; CPT: Current Procedural Terminology</p> <p>*To be identified with a chronic condition, specifications require at least one CPT and ICD-9-CM code to be paired on the same day</p>			

eTable 2. Investment Cost of Implementing TBC Program

Transitional or Ongoing	Cost Category	2010	2011	2012	2013	Total
Medical Group (Clinics)						
Ongoing	Salaries	\$82,850	\$572,537	\$2,339,485	\$5,814,858	\$8,809,729
Transitional	Clinic/infrastructure expansion	\$6,187	\$42,753	\$174,697	\$434,214	\$657,850
	Computers and phones	\$10,000	\$34,000	\$70,000	\$96,000	\$210,000
SelectHealth (Health Plan)						
Ongoing	Medical Home Care Coordination Payments	\$20,526	\$183,541	\$340,035	\$707,012	\$1,251,113
	Medical Home Quality/Goal Payments	\$25,000	\$118,441	\$298,333	\$695,000	\$1,136,775
Combined Totals (Clinic + Health Plan)						
All Costs	Total Investment (Aggregate \$)	\$144,563	\$951,272	\$3,222,550	\$7,747,083	\$12,065,467
	Total Investment (Per Member Per Year - PMPY)	\$0.53	\$3.28	\$10.32	\$22.19	\$9.86

eTable 3. Post Hoc Stratified Analysis: Patients with all 4 years in the same level of TBC

Variables	Patients with all 4 years in same level of TBC* n=51,596				
	Normalized‡		Adjusted†		
	28,063 pt. yrs. # TBC events (%)	23,533 pt. yrs. # TPM events (%)	OR	95% CI	<i>p</i>
Quality Measures					
Intervention Variables					
Depression screening among patients with active depression	6,534 (22.76%)	12,610 (43.93%)	1.93	1.59, 2.26	<.001
Adherence to diabetes bundle	5,448 (31.27%)	4,195 (23.65%)	0.77	0.45, 1.33	.345(ns)**
Documented Self-care plan	86 (1.29%)	3,564 (53.50%)	41.55	30.07, 57.41	<.001
Non-intervention Variables					
Hypertension in Control (<140/90 mmHg)	42,892 (95.31%)	38,560 (85.68%)	0.89	0.76, 1.02	.081 (ns)
Documented Advanced Directives	13,385 (11.92%)	10,440 (9.30%)	0.78	0.65, 0.96	.017 (ns)
Annual visit with PCP	31,030 (27.64%)	99,605 (88.73%)	3.21	2.73, 3.77	<.001***
Service Utilization	# TBC events (incidence rate per 100 person yr)	# TPM events (incidence rate per 100 person yr)	IRR	95% CI	<i>p</i>
Hospital Admissions	14,038 (12.51)	10,669 (9.50)	0.76	0.65, 0.88	<.001
Emergency Department visits	38,416 (34.22)	19,592 (17.45)	0.51	0.46, 0.56	<.001
Ambulatory Sensitive Visits	6,229 (5.55)	3,613 (3.22)	0.58	0.44, 0.76	<.001
PCP visits	306,698 (273.22)	285,229 (254.10)	0.93	0.92, 0.94	<.001
Specialty Visits	281,991 (251.21)	245,332 (218.55)	0.87	0.84, 0.90	<.001
Urgent Care Visits	53,868 (47.99)	67,874 (60.47)	1.26	1.18, 1.36	<.001****

*TPM group is the referent; CI= Confidence Interval; IRR= incidence rate ratio; IQR- interquartile range; β= Beta coefficient; Intervention variables: measures linked specifically to TBC deployment; Non-intervention variables: measures that were not directly linked to TBC deployment

‡ The dataset was normalized by dividing by the odds ratio for quality measures and IRR for service utilization. This adjusted factors were next multiplied by TBC percentage and events to compute the corresponding TPM values.

†Generalized Estimated Equations modeling that adjusted for possible confounding including: age, sex, race/ethnicity, Charlson comorbidity index, geographical region of care, type of insurance, and number of years of routinized MHI prior to the study period (2003-2009).

For outcomes related to quality measures and service utilization, a *p* ≤ .008 must be achieved to account for multiple inter-related comparisons. Outcomes not meeting this threshold were designated as non-significant (ns).

**For adherence to a diabetes bundle, reduced sample size in this subgroup analysis reduced statistical power dramatically.

***There was a system-wide initiative to increase annual visits to primary care as part of CMS quality rankings which had financial consequences. We hypothesize that TBC practices had evolved to a point of internal organization where they were better able to address such wide-spread initiatives.

****As predicted prior to the analysis, urgent care visits (walk-in primary care as an alternative to ED visits) should increase. This appears to be more concentrated in the subgroup analysis and is less apparent among the larger study population.