

Integrated Diabetes Oncology Care

Janelle M. Sharma DNP, CRNP
Lehigh Valley Health Network, Janelle_M.Sharma@lvhn.org

Gregory R. Harper MD, PhD
Lehigh Valley Health Network, Gregory.Harper@lvhn.org

Cara Habeck RN, CDE
Lehigh Valley Health Network, Cara.Habeck@lvhn.org

Cathy A. Coyne PhD, MPH
Lehigh Valley Health Network, Cathy_A.Coyne@lvhn.org

Roya Hamadani MPH
Lehigh Valley Health Network, Roya.Hamadani@lvhn.org

See next page for additional authors

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Authors

Janelle M. Sharma DNP, CRNP; Gregory R. Harper MD, PhD; Cara Habeck RN, CDE; Cathy A. Coyne PhD, MPH; Roya Hamadani MPH; Hope Kincaid MPH, CPH; Ada M. Rivera BA; Gretchen A. Perilli MD; and Nicole R. Sully DO

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Janelle Sharma, DNP, CRNP

Dr. Gregory Harper

Cara Habeck, RN CDE

Cathy Coyne, PHD

Roya Hamadani, MPH

Hope Kincaid, MS

Ada Rivera, MBA

Dr. Gretchen Perilli

Dr. Nicole Sully

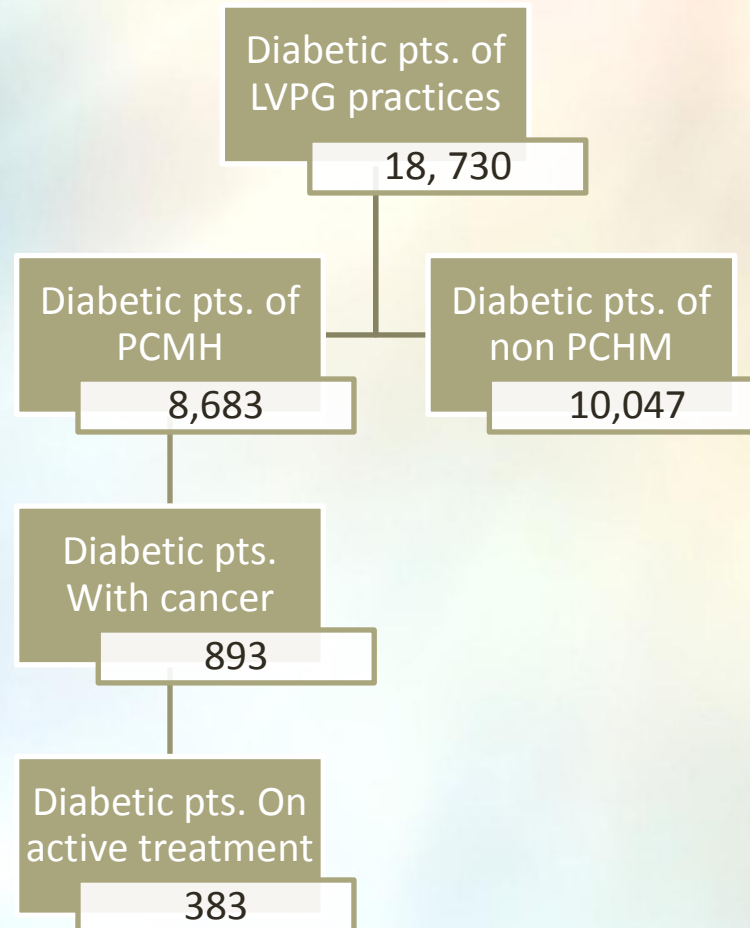
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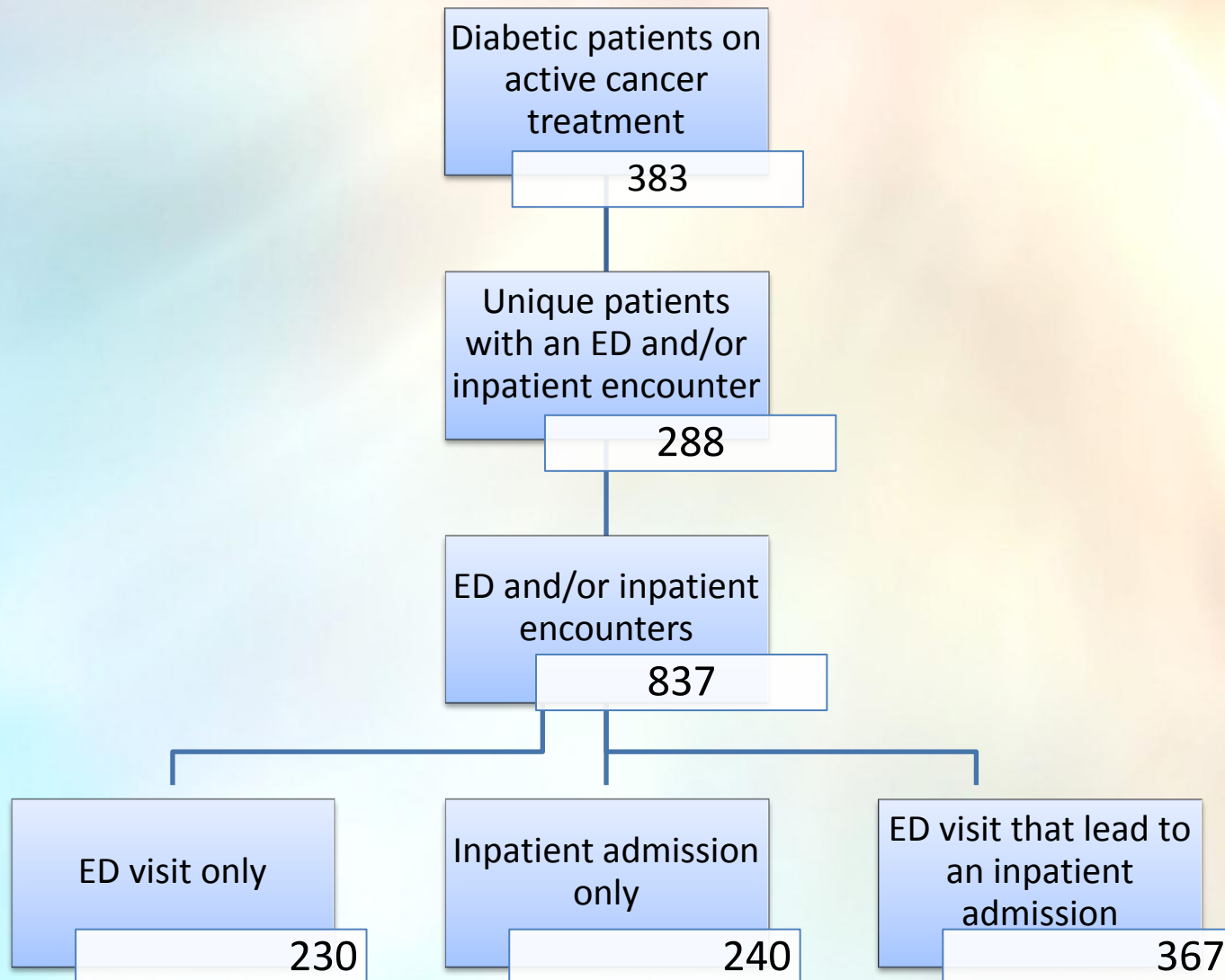
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- This program received support from Hospital Executive Leadership, Department of Medicine Leadership, Nursing Leadership and Oncology Administration.

Diabetic patient population-LVHN



April 1st, 2011-March 31, 2012

Diabetic cancer patient population



Significance

- Cancer patients with diabetes are at high risk for developing complications.
- Cancer patients with diabetes require high levels of care coordination between specialists, PCP's, and PCMH's to ensure optimal outcomes.
- Improving care coordination between providers and patients can aid in improving quality of care by facilitating beneficial, efficient, safe, and high-quality patient experiences.
- This study contributes a new model of integrated health care delivery that is aimed at improving quality of care for cancer patients with diabetes to both the existing medical and nursing literature.

At what cost?



Hyperglycemia:

Average ED visit at LVHN (CC & MUHL):

\$629.50



Hypoglycemia:

Average ED visit at LVHN (CC & MUHL):

\$493.50



Average Hospital Admission (CC & MUHL):

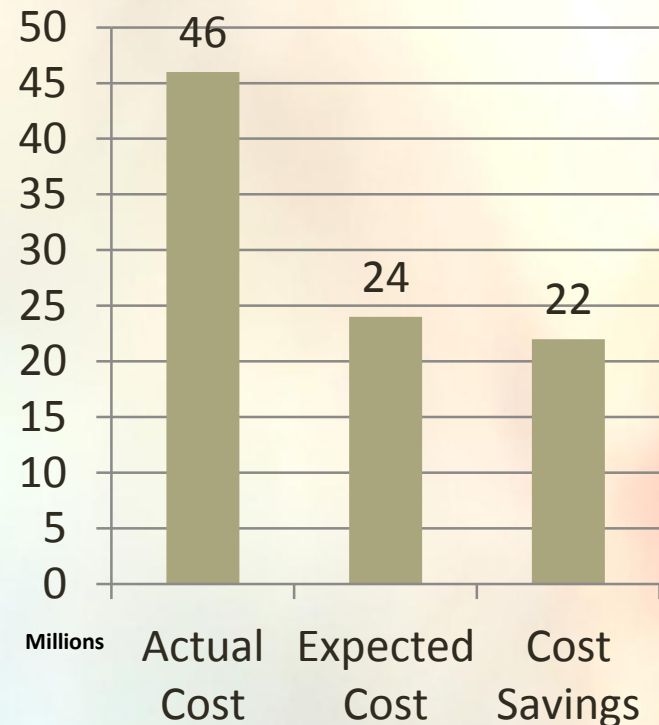
\$12,990

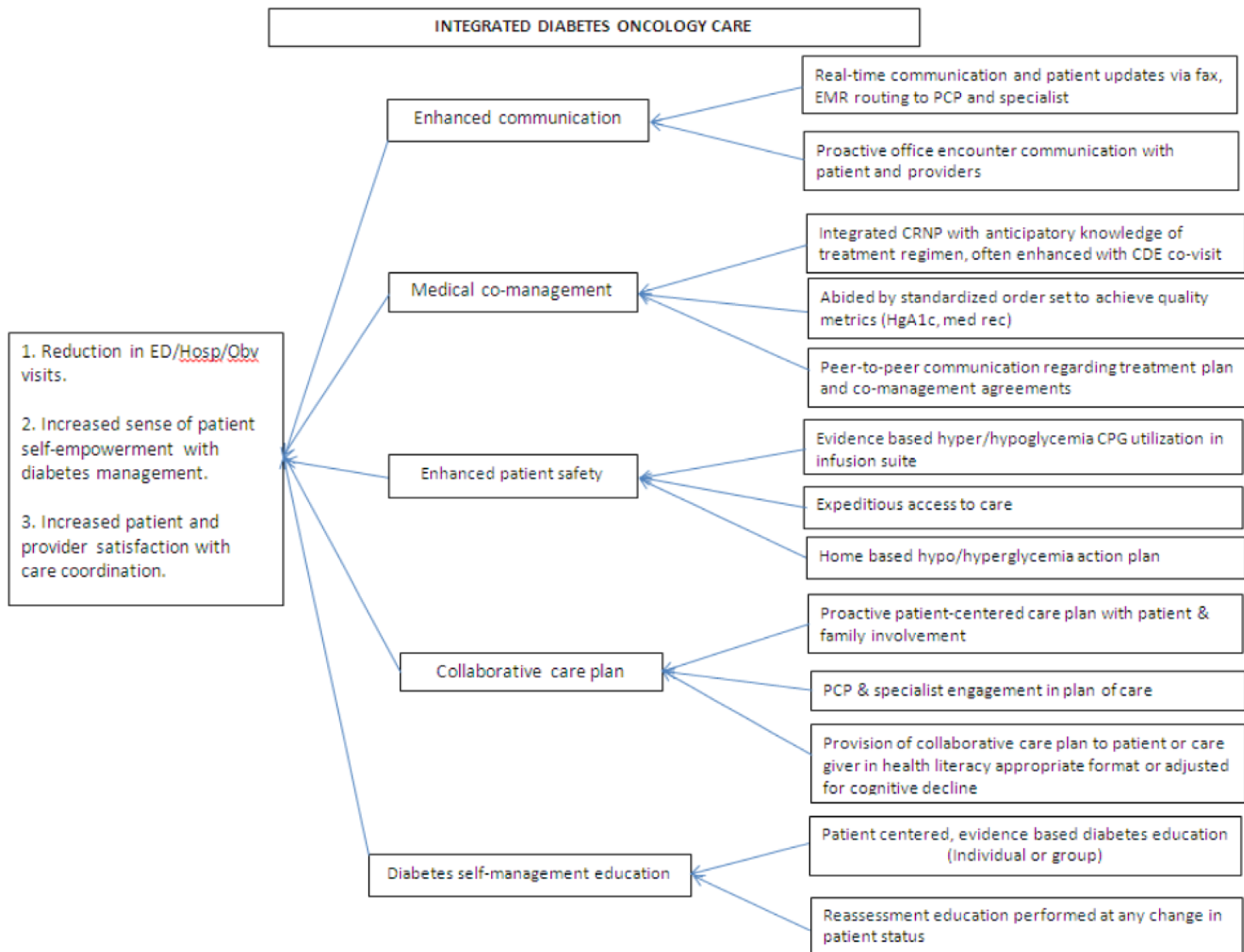
Cost of Uncoordinated Care

- The estimated excess cost of uncoordinated services is approximately \$7,340 per Medicaid/Medicare patient.
- Extremely uncoordinated care should be avoidable with improved care integration, enhanced and targeted interventions and care coordination between providers.
- 10% of patients account for 48% of medical costs

IOM (Institute of Medicine). 2010. *The Healthcare Imperative: Lowering Costs and Improving Outcomes: Workshop Series Summary*. Washington, DC: The National Academies Press.

Cost of Coordinated vs. Uncoordinated Diabetes Care





Specialist Satisfaction with Care Coordination between PCP

Specialist Satisfaction with Primary Care Provider Communication		
Area of Communication	Mean score	SD
Method of communication	3.36	1.39
Quality of information provided prior to consultation	3.38	1.19
Clarity of reason for referral	3.92	1.19
Patient's understanding of reason for referral	3.64	1.08
Provider's management of patient chronic diseases	3.50	1.31
Provision of summary of care record	3.77	1.09
Collaboration of patient self-care support	3.36	1.45

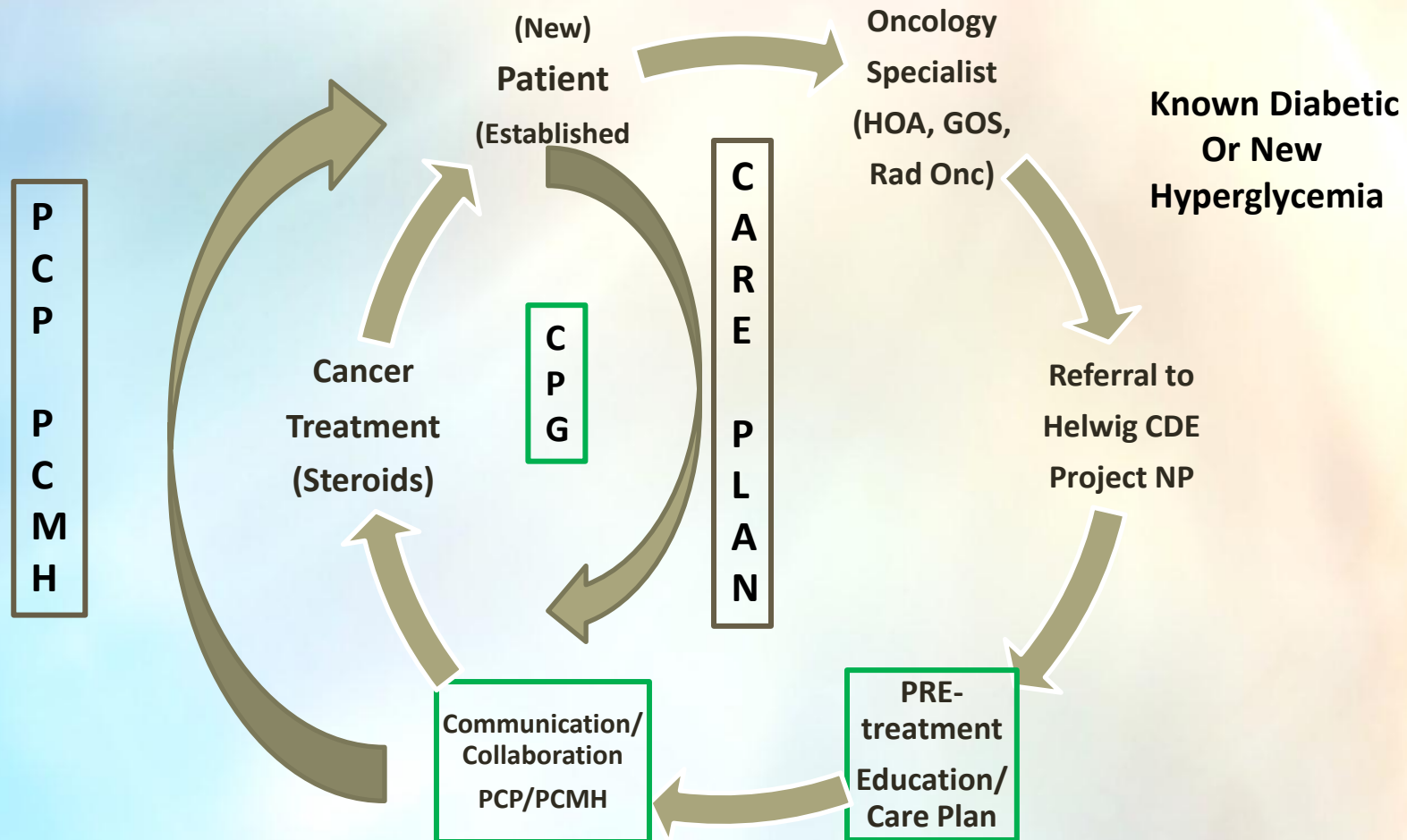
Range = 1-5; lower score more satisfied

Primary Care Provider Satisfaction with Specialist Communication

Primary Care Provider Satisfaction with Specialist Communication						
Area of Communication	Cancer		Diabetes		Heart Disease	
	Mean score	SD	Mean score	SD	Mean score	SD
Method of communication	1.85	0.83	2.11	0.83	1.85	0.84
Quality of information provided following consultation	1.63	0.75	1.96	0.90	1.69	0.75
Timing of referral response	1.78	0.81	2.39	1.03	1.75	0.72
Procedures ordered by specialist	1.74	0.72	1.98	0.81	1.87	0.79
Timing of receiving results of tests ordered by specialist	1.88	0.76	2.05	0.91	1.86	0.77
Recommended treatment by specialist	1.62	0.68	1.82	0.78	1.68	0.67
Provision of summary of care record	1.76	0.77	2.01	0.87	1.82	0.75
Collaboration in patient self-care support	2.01	0.96	2.23	0.96	2.05	0.88

Range = 1-5; Lower score more satisfied

Collaborative Care of Diabetic Patients with Cancer: Co-management



Diabetes Oncology Program

- **The Diabetes Oncology Program (DOP):** Developed as an integrated model of care for oncology patients with diabetes.
- **Key program elements:**
 - Expeditious access to care
 - Enhanced care coordination
 - Enhanced communication
 - Diabetic self-management education conducted by a CDE
 - Medical co-management provided by a CRNP.

Goals of the Program

Primary Goals:

- 1.) Reduce emergency department (ED), observation and hospital visits related to hypo/hyperglycemia in the diabetic cancer patient

Secondary Goals:

- 1.) Improved patient satisfaction with care coordination efforts
- 2.) Improved provider satisfaction with care coordination efforts
- 3.) Improved patient empowerment with diabetes self-management

Design

- **Design:** Descriptive design
- **Setting:** 900 bed community hospital.
- **Protection of Human Rights:**
 - IRB approval process at both hospital and university

Theoretical Framework

- **Social Cognitive Theory by Dr. Albert Bandura**
 - Factors influencing self-efficacy:
 - Behavioral, Environmental, Cognitive
 - How people interpret the results of their own behavior informs and alters their environments and the personal factors they possess which, in turn, inform and alter subsequent behavior.
 - Self-efficacy enhancement is often a goal in interventions designed to change individual health related behaviors.

Review of Literature: Hyperglycemia-Related Admissions

- Cheung, Li, Ma and Crampton (2008)
“hyperglycemia in critical illness is associated with increased mortality” (p. 952).

Review of Literature: Hospital Admissions

- There was very limited studies evaluating programs aimed at diabetes related hospital admissions.
- Davidson et al (2007), studied use of a DSME program in the ED. They found that the year prior to the intervention, 14 patients used the ER/urgent care 15 times, accounting for \$129,176 in healthcare expenses. The year after the intervention, four patients made five ER/urgent care visits, resulting in \$24,630 in healthcare expenses ($p < 0.001$).

Review of Literature: Care Coordination

- According to O'Malley and Cunningham (2008), communication between the specialists and the PCP is not felt to “always” be apparent to the patient.
- Peikes et al. (2009) reported that to date, there have been very few programs that have shown effective care coordination methods.

Review of Literature: Diabetes Self-Management Education

- Clark (2007) found that diabetic patients who received diabetes education felt the most empowered with diabetes self-management.

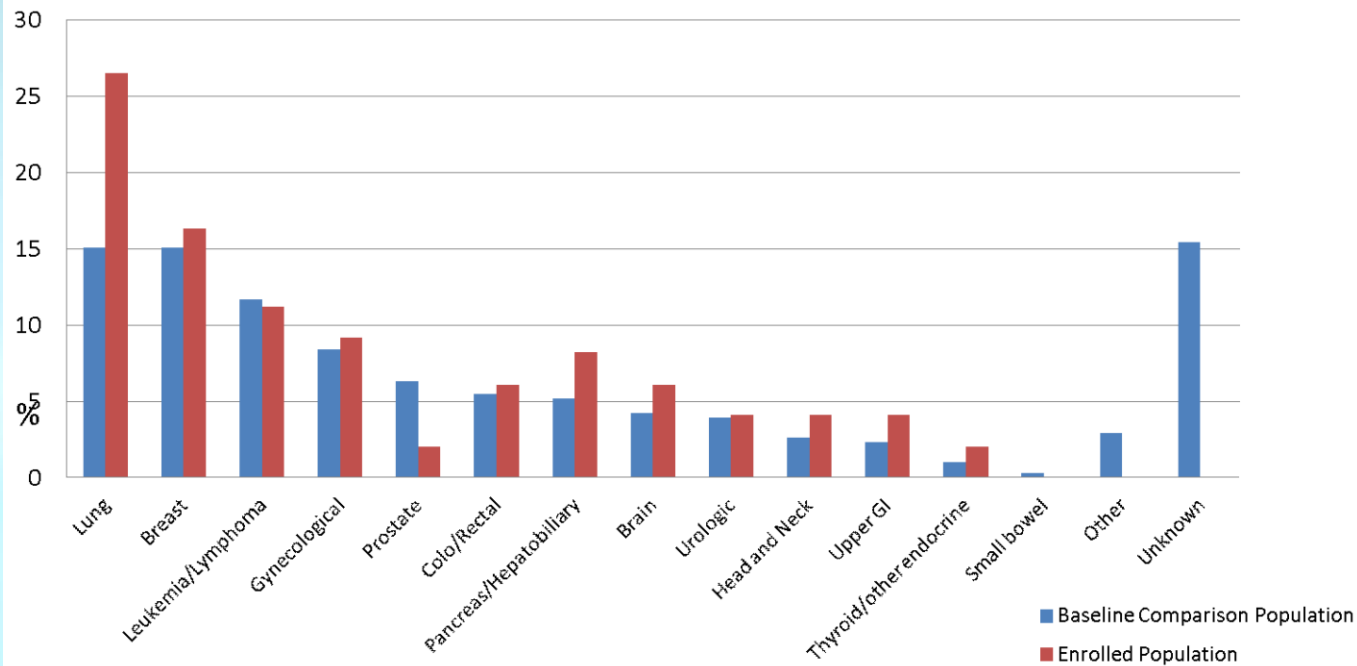
Sample

- **Sample:** Cancer patients with diabetes under active treatment. Active treatment defined as chemotherapy or radiation.

Comparison Group (<i>n</i> = 383)		DOP (<i>n</i> = 98)	
Seen 04/01/2011-03/31/12		Enrolled 10/01/2012-05/13/2013	
Male	(54.6%)	Male	(46.9%)
Non-Hispanic	(95.6%)	Non-Hispanic	(93.9%)
White	(93.0%)	White	(84.7%)
English speaking	(95.8%)	English speaking	(92.9%)
Older than age 65	(57.2%)	Older than age 65	(54.1%)
Medicare	(62.4%)	Medicare	(56.1%)
Type II diabetic	(95.8%)	Type II diabetic	(99.0%)
Married	(66.3%)	Married	(68.4%)

Tumor Distribution

Tumor Distribution Baseline Compared to Enrolled



FACT-G Quality of Life

Function Assessment of Cancer Treatment (FACT-G): Assessed patients quality of life in realms of physical well-being (PWB), social well-being (SWB), emotional well-being (EWB), and functional well-being (FWB) for the DOP patients.

FACT-G Quality of Life Results

Subscales	Program Group ($n = 52$)		Normative Data ($n = 2236$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PWB	20.2	6.60	21.3	6.0
SWB	22.7	5.47	22.1	5.3
EWB	18.1	4.51	18.7	4.5
FWB	16.4	7.14	18.9	6.8
FACT-G Total Score	77.3	18.63	80.9	17.0

Note. Source of normative data was from Brucker et al. 2005.

Assessment of ED, Observation and Hospital Admissions

- Claims data were used to evaluate diabetes related ED, observation and hospital admissions (Top 3 diabetes-related discharge codes).
 - Comparison group for admission data only ($n = 383$)
 - (Seen 4/1/11-03/31/12)
 - DOP: ($n = 98$)
 - (Enrolled 10/1/12-5/13/13)

Results: Clinical Question #1

- Is there a reduction in the number of ED, observation, and hospital admissions for oncology patients with diabetes who are enrolled in the DOP?
- Results: A 3.4% reduction in potentially avoidable ED, observation, or hospital admissions in the DOP group was found.

Assessment of Satisfaction and Diabetes Empowerment

- Pre-program/Post-program surveys were administered to assess satisfaction and diabetes empowerment.
 - **Primary Care Assessment Survey:** Measured patient satisfaction with care coordination.
 - **Diabetes Satisfaction Treatment Questionnaire:** Measured patient satisfaction with diabetes treatment and perceptive frequency of blood glucose control.
 - **Diabetes Empowerment Scale:** Measured empowerment with diabetes management.

Results: Clinical Question #2

- Is there improved patient satisfaction with care coordination for oncology patients who are enrolled in the DOP?

Results from the Primary Care Assessment Survey

Group	<i>n</i>	Mean	SD	Minimum	Maximum
Pre-Program	51	79.74	20.41	23.33	100.00
Post-Program	18	86.00	17.71	33.33	100.00

Note. Score range is 0 to 100. A higher score indicated a higher level of satisfaction.

Diabetes Treatment Satisfaction

Results from the Diabetes Treatment Satisfaction Questionnaire

Group	<i>n</i>	Mean	Median	Mode	SD
Pre-Intervention	77	4.94	5.17	6.0	1.17
Post-Intervention	20	5.38	5.67	6.0	0.79

Note. The total satisfaction score was calculated with an average of the variable imputed into missing values.

Results: Clinical Question #3

Is there improved sense of self-empowerment with diabetes self-management for oncology patients who are enrolled in the DOP?

Results from the Diabetes Empowerment Scale

Group	<i>n</i>	Mean	Median	Mode	SD
Pre-Program	49	4.04	4.13	4.5	.73
Post-Program	20	4.59	4.86	5.0	.63

Note. Score range is 1 to 5. A higher score indicated a higher level of empowerment.

Acceptability of High and Low Blood Sugars

Acceptability of High and Low Blood Sugars

Group	Pre-intervention		Post-intervention	
	<i>n</i>	%	<i>n</i>	%
Acceptably High Score				
1	8	10.4	2	10
2	5	6.5	2	10
3	15	19.5	7	35
4	9	11.7	5	25
5	12	15.6	4	20
6	9	11.7	6	0.0
Acceptably Low Score				
1	4	5.2	14	70
2	1	1.3	3	15
3	3	3.9	2	10
4	7	9.1	1	5.0
5	12	15.6	0	0.0
6	34	44.2	0	0.0

Note. Scoring is one to six. One is “none of the time” and six is “most of the time”.

Institute Of Medicine 6 Aims

How do we measure up?

✓ **Safety:**

- ✓ Evidence based CPG
- ✓ Expeditious access to care
- ✓ Survival skills education
- ✓ Collaborative care plan

✓ **Effectiveness:**

- ✓ *Multidisciplinary team
- ✓ Evidenced based education
- ✓ Evidence based glucose management

✓ **Patient-centered:**

- ✓ Patient preferences
- ✓ Health literacy
- ✓ Cognitive function
- ✓ Cultural preferences

✓ **Timely:**

- ✓ Expeditious access to care
- ✓ Real-time deliver of care plan and treatment adjustments
- ✓ Meters provided at visits

✓ **Efficient:**

- ✓ Avoided unnecessary visits
- ✓ Remote scheduling
- ✓ Shared space
- ✓ Daily patient review

✓ **Equitable:**

- ✓ Care provided to all patients regardless of gender, ethnicity, geographic location, & socioeconomic status

Discussion

- By employing the SCT, advance practice clinicians can influence their patients diabetes self-management behaviors to improve overall outcomes.
- Methods and interventions, such as improved care coordination, medical co-management, improved communication, and enhanced diabetes education, hold possibilities to improve satisfaction, patient empowerment and reduction in ED, observation, and hospital admissions.

Limitations

- Post-program survey sample size is small.
- Due to the descriptive nature of the study design, this is not generalizable to other populations.
- Comparison data is limited to one hospital facility.

Conclusion

- Future research should be explored relating to alternative healthcare delivery models lead by Advanced Practice Clinicians, with interventions aimed at improved care coordination, patient satisfaction, and diabetes empowerment.
- This study could be redesigned and implemented in a randomized control design with a larger population.
- The program evaluation data and lessons learned from this study will be shared to assist other centers in improving care for cancer patients with diabetes.

Challenges/opportunities

- Process issues:
 - LVHN Blood sugar meter change
 - Ordering HgA1c
 - CCA
- Systems level:
 - Billing
 - Budget
- Provider level
 - New referral process
 - Comfort level with ordering diabetic CPG
 - Understanding what amount of communication is needed
 - Communication not always bi-directional
- Patients level
 - Hospice & Death
 - Severity of Cancer Diagnosis

“Care among multiple providers must be coordinated to avoid wasteful duplication of diagnostic testing, perilous polypharmacy, and confusion about conflicting care plans” (Bodenheimer, 2008).

Bodenheimer, T. (2008). Coordinating care: A perilous journey through the health care system. *New England Journal of Medicine*, 338, 1064-1071.

Questions?

Janelle Sharma, DNP, CRNP



Cedar Crest

17th Street

Muhlenberg

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