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Implementing Serious Illness Conversations in a Gastrointestinal Oncology Clinic: A mixed method evaluation of a quality improvement initiative in a Boston Hospital

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Implementing Serious Illness Conversations in a Gastrointestinal Oncology Clinic:

A mixed method evaluation of a quality improvement initiative in a Boston Hospital.

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Abstract

INTRODUCTION: Many times, advanced care planning happens too late in patients with metastatic gastrointestinal cancer, patients and families are not educated on prognostic awareness and are often not well and poorly equipped to make informed end of life decisions.

AVAILABLE KNOWLEDGE: A Serious Illness Conversation guide was developed and implemented in a Boston hospital to aid practitioners (oncology nurse practitioners and oncologists) in facilitating advanced care planning. The aim of this study was to describe provider experience with the conversation guide and understand facilitators and barriers to implementation of advanced care planning.

METHODS: The Plan Do Study Act Method of quality improvement was used for this project. In a Boston gastrointestinal oncology clinic, three medical oncologists and two oncology nurse practitioners were trained in December 2018 on use and documentation of A Serious Illness Conversation Guide. We then reviewed the electronic medical records of 121 patients with metastatic gastrointestinal cancer, with a final sample size of 72 patients, receiving their care in a solo hospital to identify documentation of ACP, as well as health care utilization outcomes. Three cohorts were chosen for this analysis: Cohort 1: 25 newly diagnosed GI oncology patients, medical records were reviewed one year prior to the Serious Illness Conversation Training of providers (N = 25); Cohort 2: Medical records were reviewed on an additional 25 newly diagnosed GI oncology patients. They were eligible if they had newly diagnosed metastatic gastrointestinal cancer, this was three months prior to implementation of the Serious Illness Conversation training (N = 25); and the final Cohort, number 3: was a consecutive medical record review of 25 newly diagnosed patients with metastatic gastrointestinal cancer of the same trained 5 providers. This groups chart were reviewed three months after implementation of the training (N=25). We examined rates of ACP documentation and health care utilization (ED visits, hospitalizations,

ICU admissions, code status, and ACP documentation and hospice use) in these cohorts. Literature review and listserv query were conducted to identify serious illness conversations.

INTERVENTION: Serious Illness Conversation Training was performed for each individual provider. Post training for 3 months, January 2019 - March 2019, weekly individual support was given to the 5 providers to reinforce workflow and documentation. Individual interviews were conducted post training in addition to chart reviews at 3 separate time points.

RESULTS: We enrolled 5 clinicians (3 medical oncologists and 2 oncology nurse practitioners) working in Gastrointestinal Oncology for Serious Illness Conversation Training. A chart review was performed on newly diagnosed patients with GI oncology

There were no differences between groups from time of diagnosis to an advanced care planning conversation. Patients in the post-intervention cohort had a shorter time from diagnosis to ACP (advanced care planning) conversation compared to those diagnosed one year prior to the intervention ($B = -293.58$, 95%CI -1003, 446, $P = 0.407$), but this was not statistically significant.

CONCLUSIONS: Training a small cohort of clinicians in Serious Illness Conversations, documentation in the EHR and coaching has aided these practitioners in implementation of formal advanced care planning that is accessible and visible. This study was conducted in GI oncology to demonstrate feasibility, barriers and facilitators to use of this guide. It also has illustrated that it is possible for earlier serious illness conversations leading to more informed advanced care planning.

Keywords: advanced care planning interventions, advanced cancer, goals of care discussions, oncology nurses, oncology nurse practitioners, oncologists, serious illness conversations.

Global Problem

In the absence of serious illness conversations (SIC) and advanced care planning (ACP), patients with stage IV gastrointestinal cancers are often the recipients of crisis driven, aggressive care at the end of life. Frequently, these cancers are diagnosed at stage IV and carry less than a 2-year survival rate. Sometimes, patients with advanced gastrointestinal cancers are at higher risk to receive aggressive care as the landscape of newer treatments emerge. Unfortunately, less than a third of patients with metastatic gastrointestinal cancers reported a SIC with their clinician upon diagnosis or at the first oncology visit. Often the first end of life discussion occurs within a month of death (Paladino et. al., 2019).

Serious illness conversations are those patients, family, practitioner discussions which include conversations around hopes and wishes for the future, goals of treatment, (ACP) well as end-of-life (EOL). In 2015, a landmark study by Dr. Jennifer Temel and colleagues at Massachusetts General Hospital Cancer Center (MGH), showed that integrating palliative care and ACP planning early in the course of illness for patients with advanced gastrointestinal cancer led to improvements in patient quality of life and mood. Patients also reported a more accurate understanding of their illness and prognosis and received less aggressive care at the end of life (Temel et al., 2015).

Timely consideration of palliative care (planning that happens early and often in addition to symptom management), which encompasses serious illness conversations, is imperative for those living with a serious illness. Therefore, it is critical that oncology providers not only know how to offer anti-cancer therapy, they also need to be versed in providing primary pallia-

tive care. Patients who are cared for by providers who have confidence with palliative care skills not only experience improved outcomes, but also have prognostic clarity around their illness and goals, which leads to better EOL outcomes. We need future strategies to train and prompt advanced care planning for the seriously ill patient and families.

Local Problem

In 2015, MGH senior leadership, as part of a hospital wide quality improvement initiative, developed The Continuum Project. This QI initiative was to train all specialties and primary care practitioners to learn how to have serious illness conversations with the goal of enhancing the provision of care for patients and their families confronting serious and imminently terminal diagnoses. The Serious Illness Conversation Project builds on the idea that these discussions should be an ongoing process that evolves throughout the patient's illness and informed by their clinical course. Using a train, the trainer model, it was determined that each disease specialty was responsible for carrying the project's vision forward in their own units. This report summarizes the work completed on this project in the Gastroenterology cancer clinic at MGH.

Available Knowledge

Gastrointestinal (GI) cancer is an umbrella term that defines cancers of the esophagus, stomach, gallbladder, biliary tract, liver, pancreas, small intestine and bowel (large intestine, colon and rectum) and anal cancer. Esophageal, pancreatic and colorectal cancer were in the top ten leading causes of cancer related deaths in the United States in 2018 with pancreatic cancer holding the lowest five-year survival rate of any solid tumor (8 percent) (ACS 2019). The medi-

an survival for patients with untreated, locally advanced, unresectable pancreatic cancer can be 8 to 12 months and only 3 to 6 months for those with metastatic disease at diagnosis.

In the current modern era of chemotherapy, we have achieved the best outcomes to date with chemotherapy. Often patients are living well beyond the predicted 11.1-month median survival date. While patients receiving chemotherapy generally report better overall quality of life, extended survival with chemotherapy does not always correspond to reduced symptom burden. Because of the anatomic location of the pancreas in the central abdomen at the root of the mesentery, most patients suffer with a high symptom burden that requires management of potential issues such as pain, intractable nausea, anorexia, depression, anxiety, biliary obstruction, gastric outlet obstruction, ascites, and venous thromboembolism.

The Institute of Medicine report, *Dying in America*, (2015) discussed patients experience at the end of life as having poor symptom control, frequently needing medical visits and an overwhelming burden of responsibility for families. According to the American Medical Association, Advanced Care Planning is a way to honor patient directed choices and encourage a shared decision model for the patient and clinician to achieve together (Advanced Care Planning, AMA, 2019). Lastly and most importantly, early discussions of patients' goals have been associated with improvement in patients' quality of life and receipt of less aggressive medical care at the EOL, that is likely more value-concordant for both patients and families. The care with detailed planning is care that can be consistent with an individual patient's goals but is often not addressed and patients are exposed to care that is inconsistent with their wishes (Bernacki/ Block JAMA 2014). Unfortunately, advanced care planning is rarely occurring, and it is occurring too late in the illness trajectory.

The patient and provider can move through a short list of questions that create an assessment of what is most important to the patient. While keeping the focus on the patient's prognostic awareness and with an end goal to understand the patient's values, fears and wishes. This guide was adapted and utilized as the foundation for improving serious illness conversations in gastrointestinal oncology patients and to guide clinician training and workflow.

Use of a tool to guide clinicians and patients through shared goals of care was found to be very beneficial. The patient and provider team decide when it is time to shift from anti-cancer therapy to best supportive care (Bakitas et al., 2017). Multiple models exist, like Vital Talk and Respecting Choices but these specific programs have not been formally evaluated or disseminated. There is inadequate structural support for advanced care planning, as a standard documentation system is absent for providers. Especially in GI malignancies that become metastatic, there is not a current roadmap to help providers and patients a patient centered philosophy as they become more ill. There is a belief that physicians should be the drivers of these conversations and decisions. There is a lack of data on the appropriate timing of these conversations and the collaboration between oncologists, oncology nurses and oncology NPs around ownership of these conversations (Cohen & Nirenberg, 2011).

A more in-depth review of the literature illustrates that patients and families have a preference of providers to be the drivers of advanced care planning discussions. There is still a lack of clarity around the best timing of these conversations as the inappropriate time could diminish hope and be disruptive to a therapeutic process and clinical patient relationship (Leblanc, Nickolich, El-Jawahri, & Temel, 2016). The literature identifies themes of major gaps in communication between providers, patients and their families. In the study by Zhang et al., (2009), only

31% of patients with advanced cancer were having early discussions about end of life care with their oncology provider. In another study, approximately 70% of Americans were open to discussing advanced care planning if prompted (Eidsness, Schellinger, Young, & Bennett, 2008; Jackson, Rolnick, Asche, & Heinrich, 2009).

Early conversations to clarify values and beliefs is most helpful to take place when a patient is initially diagnosed with metastatic disease. These early conversations can be built upon for ongoing deeper discussions about prognosis, wishes and care at the end of life. Having early conversations and often, allows the patient and family peace around decisions and subsequent time to focus on quality of life and planning. This type of planning also allows a standardized approach that can be tailored to all populations of patients despite differences, whether they are cultural, religious, psychological or patients with low health literacy.

Ahluwalia et al., (2015) were able to illustrate that documented early advanced care planning in a population of veterans was associated with lower rates of acute care at the end of life. A mixed-methods summative evaluation by Bakitas et al., (2017) revealed that in a population of 57 patients with either lung or gastrointestinal cancer and 20 caregivers, which 80% were spouses, had a high degree of satisfaction with the patient decision aid used. The tool allowed patients to look ahead at choices for medical care when seriously ill. The participants felt empowered, were privy to treatment options and wanted (Bakitas et al., 2017) to take part in advanced care planning. Another similar study revealed that the intervention group of patients who were trained on QPL related topics (question prompt list) and their oncologists who received formal communication training were three times more likely to ask about prognosis (Rodenback et al., 2017). There were 140 topics for potential discussion in the intervention group, which was on-

cologist and patient dyad. 99.3% of the topics were discussed with the oncologist (Rodenback et al., 2017). The three most common barriers to advanced care planning were the patient's lack of readiness and acceptance; the physician is rushed and staff discomfort around the topic (Zhou, Stoltzfus, Houldin, Parks & Swan. 2010).

Teaching interventions for the oncologist and patient, can be a way to discuss worsening cancer and can be instrumental for the patient. Patients who were given questions prior to their visits and the oncologist, who was trained in communication around advanced care planning, showed an improvement in the patient-provider communication (Rodenback et al., 2017). Advanced care planning soon after a metastatic cancer diagnosis helps patients and families focus on decisions that decrease burdensome care, hence improving quality of life. Education and exposure programs like Looking Ahead: Choices for Medical Care when you are Seriously Ill (Bakitas et al., 2017) are patient decision aids that empower patients.

The literature reveals that learning how to have early advanced care conversations will benefit the care of the patient and their provider. The body of evidence is applicable and generalizable to a population of patients with advanced cancer and their oncology providers. Knowing when to start conversations and planning is a topic of intense focus currently. Movement toward this shift in communication is limited by the lack of identifiable formalized pathways to have these conversations and structured developed guides. The nuance of this skill keeps the focus on the patient and respect for their process. The lack of a patient's curiosity and the oncologists coping may limit transparency and movement toward these discussions (Bernacki, et al., 2019).

Rationale

The foundation of this DNP QI Project utilized the Diffusion of Innovation Theory as the guiding theoretical framework. This theory is one of the oldest social science theories dating back to 1962 (Rogers, 2003). Its original construct was to explain how over time an idea gains adoptability and spreads through a specific population. The result of this saturation is that people, as part of a social system, adopt a new idea, behavior or product. The key to adoption is the person using the idea must perceive it as innovative. Adoption of something new is a process where some adopt it easily and others do not. Researchers have identified early adopters of innovation are different than people who adopt later down the line. There are five established adopter categories, innovators, early adopters, early majority, late majority and laggards (Rogers, 2003). Innovators are interested in new ideas and are considered risk takers. They often do not need appealing to be convinced to take a risk and try something new. Early adopters are leaders and do well with structured communication in the form of how-to manuals. Early majority is the most likely represented of the general population. They are rarely in leadership positions and need to see evidence before implementing innovation. The final two categories are late majority and laggards where skepticism, tradition and conservative beliefs hold these populations back.

Specific Aims

- 1) To increase the documentation rate of ACP documentation by 10% by the end of the project in March 2019.
- 2) To examine the impact of training GI oncology clinicians on the use of the serious illness conversation guide on patients' rates of hospitalization, ACP documentation and hospice utilization.

- 3) To qualitatively examine facilitators and barriers to using the serious illness conversation guide in clinical practice.

Context

The setting was Massachusetts General Hospital Cancer Center, Outpatient Gastrointestinal Cancer Clinics. The GI clinic is in an outpatient setting that is adjacent to the main hospital. This is a private clinic that has 29 single examination rooms, where patients and their families come for evaluation. Patients who present to this clinic are on active chemotherapy for a gastrointestinal malignancy. They are often seen by their nurse practitioner or oncologist on average three times per month for therapy and symptom management. They receive chemotherapy/immunotherapy and or symptom management in the same clinic on an adjacent suite. Three medical oncologists and two oncology nurse practitioners were chosen to be part of this project as early trained adopters of the Serious Illness Conversation training and implementation.

Intervention

Ariadne Labs is a joint center of innovation between Brigham and Women's Hospital and the Harvard T.H. Chan School of Public Health. This center for innovation has brought together experts in palliative care, who in 2011 developed a scalable model that systematizes a guide to structure the Serious Illness Conversation Template. The questions in the guide focus on hopes and worries for the future. The guide specifically allows the provider to ask open ended questions that can be tailored to each patient. The aim of training providers on serious illness communication is to help providers to have a deeper quality and meaning conversation with the intention that the patient and clinician anxiety around initiating these emotionally difficult conver-

sations should diminish. The customizable guide or script helps to initiate planning when one is diagnosed with a life-threatening illness. The guide avails clinicians to a structured conversation algorithm, where it starts with asking permission to open the discussion to a more intimate look at patients and families. There is a concern that talking about end of life goals/advanced care planning can potentially cause more anxiety and lessen hope. Block and Bernacki (2014), bring to light and reference many articles that indicate earlier advanced care planning does not harm patients, rather create more peace in patients and families lives.

Two oncology nurse practitioners and five medical oncologists underwent a 3-hour training on how to utilize the Serious Illness Conversation guide in their practice. This APRN was the trainer for these providers. In addition, this APRIN prepared a detailed case to be utilized as a script for the providers about a complex gastrointestinal oncology case. One that encompassed medical, psychosocial and spiritual complexity as it related specifically to a patient with metastatic gastrointestinal cancer who had a likely prognosis of 1-2 years. The goal in training this group of 5 providers was to teach them the tools to then have an earlier goals and values conversations with their patients.

The 5 GI oncology providers (3 GI Medical Oncologist's and 2 GI Oncology Nurse Practitioner's) underwent a 3-hour training in December 2018. The training was outlined as such: Reflection (10 min), an introduction and description of how a Serious Illness Conversation differs from a goals of care discussions/end of life planning, the minutiae of the Serious Illness Conversation Guide, how one would Implement the Serious Illness Conversation Guide in clinical practice, Discussion of Prognostic Awareness, learning how to Document in Epic (35 minutes). Then a 30-minute role play demonstrating how to use the Serious Illness Conversation

Guide. The 5 providers were given a 15-minute break before then doing a 90-minute skills practice in their small group. Practice with the serious illness conversation guide was used during role plays. Then the last 15-minute break was given before a wrap up discussion on how these 5 clinicians would implement a Serious Illness Conversation into their clinical practice, including documentation into the EHR. In the three months after training, this APRN was present in the weekly clinics of the GI oncologists and NPs to answer questions around utilization of the guide and subsequent documentation of ACP in the EHR. There was a daily check in with providers to prompt them to identify patients who are appropriate for a conversation using the guide. Functioned as a peer-educator around the use of the Electronic Health Record (EPIC).

The proposed timeline that helped actualize this DNP project started with project approval in mid-October 2018. The identified cohort of GI Oncologists and NPs signed up for Serious Illness Conversation Training in November 2018. Chart reviews were performed on 25 patients newly diagnosed with a metastatic GI Cancer during the time period of 1-year pre-intervention from June 2017 - August 2017. Training for the NPs and MDs took place in December 2018. Peer Educator support was provided from December to March to help with coaching, usability of the tool and integration. In March 2019, provider interviews were conducted in order to gather qualitative data, in addition to final chart reviews on 50 patients pre and post training of providers. Results were analyzed in mid - March of 2019 and the final report submitted on May 9, 2019 to UNH to fulfill requirements of the DNP. See Appendix A for Project Timeline.

Study of the intervention

Interviews were performed a month after the training in January 2019 to assess perceptions of the Serious Illness Conversation training. An interview script was composed to help gather information about positive and negative perceptions in addition to facilitators and barriers to implementation of the conversation and documentation into practice. We conducted qualitative interviews with 3 GI oncologists and 2 GI oncology nurse practitioners to assess their overall perception of the Serious Illness Conversation Training, and their perceptions of barriers and facilitators to implementing ACP discussions in their clinical practice. All interviewed were conducted within 1 month of completing the Serious Illness Conversation training. We recorded and transcribed the interviewed and thematically analyzed the content by two independent coders. Discrepancies were resolved by consensus discussion and high reliability was achieved between coders.

Measures

- In the quantitative data analysis, the variables compared were time to diagnosis to chart review or death, time of diagnosis to advanced care planning conversation, time of diagnosis to follow up (death or to the last chart review), hospice referral. Retrospective chart reviews at 3 time points for a total of 72 patients (25 in each cohort). Provider charts were reviewed consecutively, and all consults were excluded. Documentation of ACP: we reviewed and queried the electronic medical record to identify any documentation of goals-of-care discussions or ACP conversations occurring in the inpatient or outpatient setting
- Hospitalization: we reviewed and queried the electronic medical record to determine the number and duration of hospitalizations during the study period for cohorts 1, 2 and 3.

- ICU admissions: we reviewed and queried the electronic medical record to identify patients in cohort 1, 2 or 3 had any ICU admissions as part of their hospitalization.
- ED visits: we reviewed and queried the electronic medical record to capture ED visits for all three cohorts during the study period.
- Code status documentation during admission: we reviewed and queried the electronic medical record to understand coded status during a hospitalization.
- Hospice utilization: we reviewed and queried the electronic medical record to determine where hospice was being provided for those that were referred. Inpatient or home.

Analysis

Data was formatted in a password protected excel file and the data pulled into Stata for data analysis. Three cohorts were described as Cohort 1= 1-year pre intervention, Cohort 2= 3 months pre intervention and lastly Cohort 3 = 3 months post the intervention. Frequency statistics were generated for each of the categories.

Ethical Considerations/Protection of Human Subjects

This project had approval by MGH, The Continuum Project, to collect data as part of a hospital wide quality improvement initiative. All electronic files containing personal patient information were password protected to prevent access by unauthorized users. There were no ethical concerns, data was de-identified and consecutive newly diagnosed patients receiving their

care during the three time points identified during the study (1 year pre/1st 3 months of diagnosis, 3 months pre and 3 months post intervention) The chart reviews were conducted as part of a quality improvement project, training and implementation of The Serious Illness Conversation Guide (Ariadne Labs), in GI Oncology. Clinician interviews post training were also conducted as part of the quality improvement project within the context of training providers how to access and utilize The Serious Illness Conversation Guide project at Massachusetts General Hospital Cancer Center, Gastrointestinal Oncology clinic.

Results

Table 1. Summary Data

	Cohort 1 - 1 yr pre	Cohort 2 - 3 months pre	Cohort 3 - 3 months post
Age mean(range)	67 (39-85)	67 (45-92)	68 (52-86)
Gender	46% F 54% M	50% F 50% M	46% F 54% M
Disease (pancreatobiliary, colorectal, gastro- esophageal)	1= 50% 2= 38% 3= 12%	1= 33% 2= 33% 3= 33%	1= 42% 2=45% 3= 12%
Lines of Chemotherapy median (range)	1 (0-2)	1 (0-2)	1 (0-3)

(Categorical Disease - 1= Colorectal, 2= Pancreatic, 3=Gastro-esophageal)

Table 2. Descriptive Results

	Cohort 1 - 1 yr pre	Cohort 2 - 3 months pre	Cohort 3 - 3 months post
ACP Conversation (Y/N)	No - 100% of patients	Yes 20 % of patients.	Yes 17% of patients
Time from dx to ACP conversation	No observations	62.8 days	52.25 days
Total Hospitalizations	54% = 1 46% = 2	63% = 1 38% = 2	34% = 1 67% = 2
ICU Admissions	No observations	No observations	1 observation
Code status discharge from first admission	92% full code	100% full code	85 % full code
Code status last discharge	100% = Full Code	100% = Full Code	85% Full Code
Hospice Referral	77%	22%	100%

Analysis of clinician's interviews used a content analysis approach. Interviews were coded and analyzed using NVivo 11 software to identify and extract major and minor themes. Two coders independently reviewed the qualitative interviews and categorized the data into broader issues and themes. Specifically, the analysis was focused on 1) overall clinician's perception of the serious illness conversation guide training and its use in practice, 2) clinicians impressions of barriers and facilitators to implementing the serious illness conversation guide in clinical practice and 3) and feedback recommending for future implementation in the be MGH Cancer Center for all disease centers.

Overall, the intention to evaluate the effect the training had on the clinicians and subsequent implementation of the Serious Illness Conversations into practice yielded awareness and exposure to a new way of communicating. The PDSA cycle in this process was successful in that it provided information that will inform future training and implementation cancer center wide. It is difficult to compare the results of this quality improvement project with others due to lacking evidence on implementation of advanced care planning, specifically Serious Illness Conversation communication.

As observed in the data, formally training of individuals potentially could have contributed to early usability of the tool. There were no Serious Illness Conversations present a year before the intervention with no observable documentation in Cohort 1. There were no differences between groups one and 2 from time of diagnosis to an advanced care planning conversation. Patients in the post-intervention cohort had a shorter time from diagnosis to ACP(advanced care planning) by approximately 10 days sooner with a documented conversation compared to those diagnosed one year prior to the intervention where there were no observable conversations ($B = -293.58$, 95%CI -1003, 446, $P = 0.407$). This data is not statistically significant but may be relevant for future work.

Limitations

The data collected for this project only is a small sample of the larger volume of this GI oncology clinic. The early trained providers only represent a quarter of the practice. These early trained providers had the benefit of also having peer support for a three-month period of time. This may have also accounted for more conversations with the study period. Code status and

hospice utilization was hard to evaluate given most of these patients were newly diagnosed with a GI malignancy. There was not a patient arm where patients were able to prompt their provider with preparatory materials that would have prompted providers to consider the Serious Illness Conversation. There was no consideration of clinician knowledge base and how much exposure they had to prior advanced care planning training. One major limitation was the variability of the clinician's workflow and the time constraints in having these conversations. This new workflow was layered onto an already busy clinic flow. These providers were also very interested in learning more about advanced care planning and may have been more passionate to document and try these conversations out with their patients.

Nurse practitioners were focused on the benefit of the tool and how to implement it in to their workflow as they were not making major treatment decisions. There were differing philosophies between MD and NP groups on the timing of when to initiate the serious illness conversation and which role group was responsible for initiating these discussions. There was a level of fear that if there was a serious illness conversation documented, that it gave any provider the liberty to make decisions for that patient. The primary oncologists still wanted to be the ultimate decision makers with their patients.

Interpretation

There was relevance that serious illness conversations are necessary and could be instrumental in decreasing the use and exposure of highly medicalized care at the end of life for patients with terminal gastrointestinal malignancies.

The provider knowledge and communication skills around advanced care planning can help patients and their families ask appropriate questions that could open the door for more

meaningful goal focused dialogue and have a much more synergistic and open relationship with their providers and their own families/communities. This is a seismic shift from the current state of advanced care planning, where isolated decisions are made about code status or to stop chemotherapy in the setting of progressive disease.

Implications for future research would be to develop a practice workflow that identifies at risk populations of cancer patients for early conversations. This new workflow would allow for repeated discussions that ideally start early in one's diagnosis. This would give the patient and their family time for ongoing reflection and discussion, which could lead to patient and family focused medical interventions in advanced cancer.

Conclusions

The aim with of this project was to elicit behavior change in an area of healthcare that is in desperate need of improved communication. Training GI Oncologists and GI oncology nurse practitioners has helped uncover a fragmented process for taking care of seriously and often terminally ill cancer patients. Often the philosophy and goal is to follow a path to cure disease and along the way the patient's wishes, goals and hopes become disconnected from treatment planning and goal concordant care is sidelined.

The gastrointestinal oncology population is complex with disease survivability that is ever changing and lengthened with newer treatments in the pipeline. Clinician prognostication becomes a challenge for providers when working with motivated and deeply committed patients and their families. Patients are often living longer because of more detailed cancer genetics on mutational status and the potential for clinical trial eligibility. This population of patients are living much longer with many complicated palliative care needs, as the sequelae of the disease is

often what is left to manage. Patients outliving their expected prognosis depended on the specific disease (colon, pancreatic, gastric) also are burdened with more secondary issues that not originally predicted. For example, a metastatic colon cancer patient who has lived a decade, now dealing with brain metastases and having to make decisions around capacity and end of life wishes. It was empowering to train a smaller cohort of providers, as they were eager to learn the skills to improve patient care and be exposed to a tool that would also give the clinician the ability to self-reflect.

The goal of this project was to assess the impact training had for each of the GI oncology clinicians on the use of the serious illness conversation guide while looking at the timing of ACP conversations from time of initial diagnosis in parallel. In addition, other metrics were also evaluated; ED utilization, rates of hospitalization and hospice enrollment. The defined metrics as determined as a template for reviewing charts, combined with an understanding of the facilitators and barriers to using the serious illness conversation guide in clinical practice helped understand all the variables and factors that contribute deeply to a patient's care.

In having providers learn a pedagogical framework to these conversations, they were able to experience a new type of learning that is necessary to improve a skill. Textbook learning, conferences or even web-based learning would not have been effective. These clinicians were able to observe serious illness conversations, practice them while being observed and then were given real time feedback on how to hone the language to their own for implementation. There was an organic process that happened with this group of providers. The deliberateness of keeping everyone involved in a small group and then being able to see one another in the clinical setting for 3 months post the training, really instilled a feeling of change and possibility. That the possi-

bility and opportunity was there to then avail their patients of this new way of communication and formal documentation. Oncologists were able to share their deep biases around implementation of this more structured communication process and nurse practitioners were able to identify that they needed more from their collaborating physicians in terms of prognostic awareness and for them to be initiators of early conversations in a patient's disease trajectory. The nurse practitioners felt the need to have these conversations in place early to better support the very ill patients and their families they are so intimately involved with.

In this GI oncology group, to understand the barriers to implementing this much needed planning was paramount to move forward with culture change. One where patients wishes and conversations from the start of a diagnosis, to have a road map with a patient. One that encompasses the medical, psychological and spiritual components of a person. The study period was an isolated time point that helped to illustrate that this work is implementable and will take more systematic thinking on how to formally implement it.

To illustrate the importance of this work. There was a very poignant study that was just recently published in *JAMA* internal medicine and *JAMA oncology* in March 2019. The four-year randomized control trial from 2012 - 2016 of the Serious Illness Care Program, developed by Ariadne Labs, was tested at the Dana-Farber Cancer Institute. The study looked at 91 oncologists, nurse practitioners and physician assistants partnered with 278 cancer patients. Half the patients took part in the Serious Illness Care program, while half in the control group received standard of care. The study showed that quality earlier conversations patients had with their providers, led to reduction in anxiety and depression by 50%. The study did not evaluate the de-

tails of the conversations and it did not impact survival rates. This study is the first using Serious Illness Conversations and the results of a structured communication system.

Provider knowledge and communication skills around advanced care planning can help patients and their families ask appropriate questions that could open the door for more meaningful goal focused dialogue and improved outcomes for patients and their families. This way of communicating could have a synergistic effect on the healthcare system, leading to a shift potentially in care that is driven by cost and disparity. To care that is driven by early discussions around what a patient would want for his or her care. This is a seismic shift from the current state of advanced care planning, where isolated decisions are made about code status or to stop chemotherapy in the setting of progressive disease.

The sustainability of this quality improvement intervention and implementation ultimately depends on integration of this specific communication tool into the cancer center wide and larger hospital system. Given that this is a mission driven goal for the hospital that will be tracked over time by quality metrics, it is probable that this will become an integrated and sustainable process for patients and providers.

Implications for future research would be to develop a practice workflow that identifies at risk populations of cancer patients for early conversations. This new workflow would allow for repeated discussions that ideally start early in one's diagnosis. This would give the patient and their family time for ongoing reflection and discussion. This could lead to patient and family focused medical interventions and decreasing exposure to highly medicalized care at the end of life for patients with terminal gastrointestinal malignancies.

Role of the Funder/Sponsor

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Appendices

Appendix A. Project Timeline

	Oct	November	December	January	February	March	April
Project approval	x						
NPs/MDs Sign up for SIC training		x					
Chart reviews 1 yr pre-intervention (1st 3 mo of new dx)		x					
SIC training			X				
3-months post training, coaching and elbow support				x	x	x	
Provider interviews 3 months post training						x	
Chart reviews, 3 mo pre-training						x	
Chart reviews, 3 mo post training							x
Analysis of outcomes							x
Results presented to UNH							x

Appendix B. Serious Illness Conversations Training Case

Serious Illness Conversations *GI Oncology Case - Clinician Role*

SETTING: Outpatient clinic, meeting with your oncology doctor, nurse practitioner

- 66 year old female homemaker and retired hairdresser with colon cancer.
- Resection for cure, then recurrence, on third line treatment, PS 1 -- working as an administrator.
- Husband has been to every visit and disseminates information to the family.

The goal of the discussion today is to explore wishes for future care using the Serious Illness Conversation Guide. The focus should be on values and goals for the months ahead rather than procedures and therapies.

Serious Illness Conversation *GI Oncology Case - Patient Role*

SETTING: Outpatient clinic, meeting with your oncology doctor or nurse practitioner.

Appendix B

Serious Illness Conversation Guide Oncology

OPEN THE CONVERSATION

I'd like to talk about what is ahead with your illness. Would that be OK?

ASSESS PROGNOSTIC AWARENESS *What is your understanding of your illness? Looking to the future, what are your hopes about your health? What are your worries?*

SHARE WORRY *Would it be OK if we talked more about what lies ahead?*

FUNCTION: *I hear you're hoping for _____ and I worry the decline we have seen is going to continue.*

TIME: *I hear you're hoping for _____ and I worry something serious may happen in the next few (wks/mths/yrs).*

ALIGN *I wish we didn't have to worry about this.*

EXPLORE WHAT'S IMPORTANT

If your health situation worsens, what is most important to you? How much do your family or friends know about your priorities and wishes?

MAKE A RECOMMENDATION *It sounds like _____ is very important to you. Given what's important to you, I recommend ...*

DOCUMENT YOUR CONVERSATION (EPIC in the ACP module) *To add to your patient note, .ACPSIL.*

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 Serious Illness Conversation Guide 

Open the conversation

"I'd like to talk about what is ahead with your illness. Would that be ok?"

Assess prognostic awareness

"What is your **understanding** of your illness?"

"Looking to the future, what are your **hopes** about your health?" "What are your **worries**?"

Share hope and worry

"Would it be ok if we talked more about what lies ahead?"

Function: "I hear you're **hoping** for _____ **and I worry** the decline we've seen is going to continue."

Time: "I hear you're **hoping** for _____ **and I worry** something serious may happen in the next few (wks/mths/yrs)."

Align

"I **wish** we didn't have to worry about this."

Explore what's important

"If your health worsens, what is most important to you?"


"How much do your family or friends know about your priorities and wishes?"

Close the conversation

"It sounds like _____ **is very important to you.**"

"Given what's important to you, **I would recommend...**"

 SIC 

 New Reading

 Flowsheets 

Last Filed Value



Serious Illness Conversation

Patient illness understanding	full awareness of prognosis - does not have a time frame in mind. ◀◀
Hopes	Live as long as possible; Be comfortable; Be independent◀◀
Worries	Other physical suffering◀◀
Prognostic information shared	Not discussed◀◀
What's important to patient/family	Would like to feel better so that she can live a full life for what time she has. Would like to return to teaching. ◀◀
Recommendations	Meeting with _____ tomorrow ◀◀ Encouraged to consider QOL and goals in choosing therapy. Encourage fol with Palliative as well (_____).◀◀

Appendix C – Perceptions of Serious Illness Conversations

Overarching ideas

- Nurse practitioners and oncologists thought the training and tool were very beneficial.
- There was differing philosophies between MD and NP groups on the timing of when to initiate the serious illness conversation.
- A concern from both role groups around causing worry for patients/families by having these conversations.
- Fear that seeing the documented conversation in a patient's medical record, allowed any provider to make end of life decisions. Primary teams wanted to still be primary decision makers with the patient and family.

A. Perceptions/themes (NP= nurse practitioner, MD= physician)**Positive Perceptions**

1. Mixed reviews - Some liked, some disliked, small group learning was excellent. (NP & MD)
2. Learning Framework and language to talk about SIC. (NP)
"Loved the training, thought it was great. Loved that there was a structured script to use. This training will change practice by giving me more confidence to continue the conversation." (NP)
3. Approach and Framework. (MD)
"Loved the training, thought it was great. Loved that there was a structured script to use. This training will change practice by giving me more confidence to continue the conversation." (NP)

Negative Perceptions

4. Training during clinic time less than ideal, the burden of having to be away from a clinic on a clinical day was difficult. (NP)
5. Role play anxiety.
"There was anxiety around having to share the space with peers and being watched and judged." (MD)
6. Logistics of using the guide, not knowing where to find it in the days following the training was not intuitive. (NP)
7. Clinic demands and being away from patient care. (MD)
8. Too hypothetical to use script in clinical practice. (NP)
"Least helpful, role playing and having to use an actual formalized script provided to us." (RN)

B. Role Change in Practice

1. Ambiguity regarding roles in the conversations. Clinician ownership regarding initiation of the conversation.
"Role in these conversations is to be a continuer of the conversation, not the initiator." (NP)
2. Training informs language used in conversation.
"Serious Illness Conversations training taught how to be more silent during those conversations. Knowing how to disseminate prognosis not just around bad news." (MD)
3. Acknowledging difficulties in changing practice. (MD)

C. Communication

Facilitators

1. Taking responsibility for early prognostic exposure.
“More initiative from the MD about prognosis would allow the invitation to use it more.” (MD)
2. Enhancing documentation quality throughout the trajectory.
“Documentation quality is excellent and should be available for every patient in each visit.” (NP)
3. Substantiating, quantifying work flow.
4. Financial incentive.
5. Easy workflow.

Barriers

1. Perceived barriers to serious illness conversation implementation.
2. Patients reluctance to address the topic.
3. Logistics of integration into the workflow.
4. Patient fear and clinician discomfort in imitating these conversations.
“Patients who need it most do not want you to go there. Fear as a clinician that you will bring more worry to a patient, this is not an easy task to accomplish. The biggest challenge is to be in the moment.” (NP)
6. Concern about documentation would impact acute decision making
“You do not want the module to be the decision maker for your patients, still want to be the primary oncologist that can share in decision making.” (MD)
7. Time constraints to having the conversations.

D. Success to Implementation

1. Engaging disease groups around challenging cases.
2. Regular occurring discussions about tough cases, weekly or bi-monthly disease specific rounds.
3. Empowering various team members to initiate and continue these conversations.
4. Shifting cultural norms around appropriateness and timing (engaging disease groups) of Advanced Care Planning discussions.
 - a. Review at Cancer Center Division Meetings.
 - b. Quality Improvement Incentive.
 - c. Pamphlets/information shared with patients upfront.
 - d.
 - e. Enhancing evidence regarding benefit of this approach.

Appendix D - Quantitative Data

Time from diagnosis to advance care planning:

There were no differences between groups from time of diagnosis to an advanced care planning conversation. Patients in the post-intervention cohort had a shorter time from diagnosis to ACP conversations compared to those diagnosed one year prior to the intervention (B = -293.58, 95%CI -1003, 446, P = 0.407), but this was not statistically significant.

. summarize age, detail

Age				
	Percentiles	Smallest		
1%	39	39		
5%	47	45		
10%	52	47	Obs	72
25%	60	47	Sum of Wgt.	72
50%	66.5		Mean	67.63889
		Largest	Std. Dev.	11.68399
75%	77	85		
90%	82	86	Variance	136.5156
95%	85	87	Skewness	-.1934949
99%	92	92	Kurtosis	2.28724

. by cohort, sort: summarize age, detail

-> cohort = 1

Age				
	Percentiles	Smallest		
1%	39	39		
5%	47	47		
10%	49	49	Obs	24
25%	59.5	50	Sum of Wgt.	24
50%	70.5		Mean	67.66667
		Largest	Std. Dev.	13.02728
75%	78	82		
90%	82	82	Variance	169.7101
95%	84	84	Skewness	-.5405427
99%	85	85	Kurtosis	2.253053

-> cohort = 2

Age				
	Percentiles	Smallest		
1%	45	45		
5%	47	47		
10%	52	52	Obs	24
25%	59.5	53	Sum of Wgt.	24
50%	64.5		Mean	67.20833
		Largest	Std. Dev.	12.42361
75%	77	80		
90%	81	81	Variance	154.346
95%	87	87	Skewness	.0819938
99%	92	92	Kurtosis	2.25291

-> cohort = 3

Age				
Percentiles	Smallest			
1%	52	52		
5%	55	55		
10%	56	56	Obs	24
25%	60	57	Sum of Wgt.	24
50%	66.5		Mean	68.04167
		Largest	Std. Dev.	9.848766
75%	76.5	78		
90%	81	81	Variance	96.99819
95%	83	83	Skewness	.1474753
99%	86	86	Kurtosis	1.779145

.

Gender	Freq.	Percent	Cum.
1	34	47.22	47.22
2	38	52.78	100.00
Total	72	100.00	

-> cohort = 1

Gender	Freq.	Percent	Cum.
1	11	45.83	45.83
2	13	54.17	100.00
Total	24	100.00	

-> cohort = 2

Gender	Freq.	Percent	Cum.
1	12	50.00	50.00
2	12	50.00	100.00
Total	24	100.00	

-> cohort = 3

Gender	Freq.	Percent	Cum.
1	11	45.83	45.83
2	13	54.17	100.00
Total	24	100.00	

.

cat_disease	Freq.	Percent	Cum.
1	30	41.67	41.67
2	28	38.89	80.56
3	14	19.44	100.00
Total	72	100.00	

-> cohort = 1

cat_disease	Freq.	Percent	Cum.
1	12	50.00	50.00
2	9	37.50	87.50
3	3	12.50	100.00
Total	24	100.00	

-> cohort = 2

cat_disease	Freq.	Percent	Cum.
1	8	33.33	33.33
2	8	33.33	66.67
3	8	33.33	100.00
Total	24	100.00	

-> cohort = 3

cat_disease	Freq.	Percent	Cum.
1	10	41.67	41.67
2	11	45.83	87.50
3	3	12.50	100.00
Total	24	100.00	

.

Lines of Chemo

Percentiles	Smallest	Largest	Mean	Std. Dev.	Obs	Sum of Wgt.
1%	0	0				
5%	0	0				
10%	0	0			72	
25%	0	0				72
50%	1	2	.6666667	.6713451		
75%	1	2				
90%	1	2	Variance	.4507042		
95%	2	2	Skewness	.78125		
99%	3	3	Kurtosis	3.65625		

.

-> cohort = 1

Lines of Chemo				
Percentiles	Smallest			
1%	0	0		
5%	0	0		
10%	0	0	Obs	24
25%	0	0	Sum of Wgt.	24
50%	0		Mean	.5
		Largest	Std. Dev.	.6593805
75%	1	1		
90%	1	1	Variance	.4347826
95%	2	2	Skewness	.929516
99%	2	2	Kurtosis	2.76

-> cohort = 2

Lines of Chemo				
Percentiles	Smallest			
1%	0	0		
5%	0	0		
10%	0	0	Obs	24
25%	0	0	Sum of Wgt.	24
50%	1		Mean	.7083333
		Largest	Std. Dev.	.6240935
75%	1	1		
90%	1	1	Variance	.3894928
95%	2	2	Skewness	.2620127
99%	2	2	Kurtosis	2.3706

-> cohort = 3

Lines of Chemo				
Percentiles	Smallest			
1%	0	0		
5%	0	0		
10%	0	0	Obs	24
25%	0	0	Sum of Wgt.	24
50%	1		Mean	.7916667
		Largest	Std. Dev.	.72106
75%	1	1		
90%	1	1	Variance	.5199275
95%	2	2	Skewness	1.029599
99%	3	3	Kurtosis	4.881023

Hospitalization	Freq.	Percent	Cum.
1	36	50.00	50.00
2	36	50.00	100.00
Total	72	100.00	

-> cohort = 1

Hospitalization	Freq.	Percent	Cum.
1	13	54.17	54.17
2	11	45.83	100.00
Total	24	100.00	

-> cohort = 2

Hospitalization	Freq.	Percent	Cum.
1	15	62.50	62.50
2	9	37.50	100.00
Total	24	100.00	

-> cohort = 3

Hospitalization	Freq.	Percent	Cum.
1	8	33.33	33.33
2	16	66.67	100.00
Total	24	100.00	

Code admit1	Freq.	Percent	Cum.
1	35	100.00	100.00
Total	35	100.00	

. by cohort, sort: tabulate codeadmit1

-> cohort = 1

Code admit1	Freq.	Percent	Cum.
1	13	100.00	100.00
Total	13	100.00	

-> cohort = 2

Code admit1	Freq.	Percent	Cum.
1	15	100.00	100.00
Total	15	100.00	

-> cohort = 3

Code admit1	Freq.	Percent	Cum.
1	7	100.00	100.00
Total	7	100.00	

. tabulate codestatusdischargel

Code Status dischargel	Freq.	Percent	Cum.
1	33	94.29	94.29
2	2	5.71	100.00
Total	35	100.00	

.

. by cohort, sort: tabulate codestatusdischargel

-> cohort = 1

Code Status dischargel	Freq.	Percent	Cum.
1	12	92.31	92.31
2	1	7.69	100.00
Total	13	100.00	

-> cohort = 2

Code Status dischargel	Freq.	Percent	Cum.
1	15	100.00	100.00
Total	15	100.00	

-> cohort = 3

Code Status dischargel	Freq.	Percent	Cum.
1	6	85.71	85.71
2	1	14.29	100.00
Total	7	100.00	

.

code status last admit	Freq.	Percent	Cum.
1	34	97.14	97.14
2	1	2.86	100.00
Total	35	100.00	

.

-> cohort = 1

code status last admit	Freq.	Percent	Cum.
1	13	100.00	100.00
Total	13	100.00	

-> cohort = 2

code status last admit	Freq.	Percent	Cum.
1	15	100.00	100.00
Total	15	100.00	

-> cohort = 3

code status last admit	Freq.	Percent	Cum.
1	6	85.71	85.71
2	1	14.29	100.00
Total	7	100.00	

.

code status at discharge last admit	Freq.	Percent	Cum.
1	27	77.14	77.14
2	8	22.86	100.00
Total	35	100.00	

.

-> cohort = 1

code status at discharge last admit	Freq.	Percent	Cum.
1	10	76.92	76.92
2	3	23.08	100.00
Total	13	100.00	

-> cohort = 2

code status at discharge last admit	Freq.	Percent	Cum.
1	11	73.33	73.33
2	4	26.67	100.00
Total	15	100.00	

-> cohort = 3

code status at discharge last admit	Freq.	Percent	Cum.
1	6	85.71	85.71
2	1	14.29	100.00
Total	7	100.00	

total hospitalization

Percentiles	Smallest		
1%	0	0	
5%	0	0	
10%	0	0	Obs 59
25%	0	0	Sum of Wgt. 59
50%	1		Mean .5932203
		Largest	Std. Dev. .4954498
75%	1	1	
90%	1	1	Variance .2454705
95%	1	1	Skewness -.3795361
99%	1	1	Kurtosis 1.144048

-> cohort = 1

total hospitalization

	Percentiles	Smallest		
1%	0	0		
5%	0	1		
10%	1	1	Obs	14
25%	1	1	Sum of Wgt.	14
50%	1		Mean	.9285714
		Largest	Std. Dev.	.2672612
75%	1	1		
90%	1	1	Variance	.0714286
95%	1	1	Skewness	-3.328201
99%	1	1	Kurtosis	12.07692

-> cohort = 2

total hospitalization

	Percentiles	Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	21
25%	0	0	Sum of Wgt.	21
50%	1		Mean	.7142857
		Largest	Std. Dev.	.46291
75%	1	1		
90%	1	1	Variance	.2142857
95%	1	1	Skewness	-.9486833
99%	1	1	Kurtosis	1.9

-> cohort = 3

total hospitalization

	Percentiles	Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	24
25%	0	0	Sum of Wgt.	24
50%	0		Mean	.2916667
		Largest	Std. Dev.	.4643056
75%	1	1		
90%	1	1	Variance	.2155797
95%	1	1	Skewness	.9166985
99%	1	1	Kurtosis	1.840336

.

total ED visits				

	Percentiles	Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	72
25%	0	0	Sum of Wgt.	72
50%	0		Mean	.0555556
		Largest	Std. Dev.	.2306689
75%	0	1		
90%	0	1	Variance	.0532081
95%	1	1	Skewness	3.88057
99%	1	1	Kurtosis	16.05882

.

-> cohort = 1

total ED visits

Percentiles	Smallest		
1%	0		
5%	0		
10%	0	Obs	24
25%	0	Sum of Wgt.	24
50%	0	Mean	.0833333
		Largest	Std. Dev.
75%	0		.2823299
90%	0	Variance	.0797101
95%	1	Skewness	3.015113
99%	1	Kurtosis	10.09091

-> cohort = 2

total ED visits

Percentiles	Smallest		
1%	0		
5%	0		
10%	0	Obs	24
25%	0	Sum of Wgt.	24
50%	0	Mean	.0833333
		Largest	Std. Dev.
75%	0		.2823299
90%	0	Variance	.0797101
95%	1	Skewness	3.015113
99%	1	Kurtosis	10.09091

-> cohort = 3

total ED visits

Percentiles	Smallest		
1%	0		
5%	0		
10%	0	Obs	24
25%	0	Sum of Wgt.	24
50%	0	Mean	0
		Largest	Std. Dev.
75%	0		0
90%	0	Variance	0
95%	0	Skewness	.
99%	0	Kurtosis	.

ICU admission	Freq.	Percent	Cum.
1	1	1.39	1.39
2	71	98.61	100.00
Total	72	100.00	

-> cohort = 1

ICU admission	Freq.	Percent	Cum.
2	24	100.00	100.00
Total	24	100.00	

-> cohort = 2

ICU admission	Freq.	Percent	Cum.
2	24	100.00	100.00
Total	24	100.00	

-> cohort = 3

ICU admission	Freq.	Percent	Cum.
1	1	4.17	4.17
2	23	95.83	100.00
Total	24	100.00	

.
. tabulate survivalstatus

Survival status	Freq.	Percent	Cum.
1	69	95.83	95.83
2	3	4.17	100.00
Total	72	100.00	

Survival status	Freq.	Percent	Cum.
1	24	100.00	100.00
Total	24	100.00	

-> cohort = 2

Survival status	Freq.	Percent	Cum.
1	22	91.67	91.67
2	2	8.33	100.00
Total	24	100.00	

-> cohort = 3

Survival status	Freq.	Percent	Cum.
1	23	95.83	95.83
2	1	4.17	100.00
Total	24	100.00	

Location of death for those who died

location death	Freq.	Percent	Cum.
1	3	100.00	100.00
Total	3	100.00	

Hospice referral

Hospice ref	Freq.	Percent	Cum.
1	2	66.67	66.67
GIP	1	33.33	100.00
Total	3	100.00	

ACP conversatio n	Freq.	Percent	Cum.
1	9	12.50	12.50
2	63	87.50	100.00
Total	72	100.00	

-> cohort = 1

ACP conversatio n	Freq.	Percent	Cum.
2	24	100.00	100.00
Total	24	100.00	

-> cohort = 2

ACP conversatio n	Freq.	Percent	Cum.
1	5	20.83	20.83
2	19	79.17	100.00
Total	24	100.00	

-> cohort = 3

ACP conversatio n	Freq.	Percent	Cum.
1	4	16.67	16.67
2	20	83.33	100.00
Total	24	100.00	

.

time_dx_acp				
Percentiles		Smallest		
1%	30	30		
5%	30	36		
10%	36	53	Obs	16
25%	61	53	Sum of Wgt.	16
50%	81.5		Mean	272.4375
		Largest	Std. Dev.	511.4101
75%	140	157		
90%	1579	157	Variance	261540.3
95%	1579	1579	Skewness	2.24361
99%	1579	1579	Kurtosis	6.081129

 -> cohort = 1

time_dx_acp

 no observations

 -> cohort = 2

time_dx_acp

Percentiles		Smallest		
1%	53	53		
5%	53	54		
10%	53	59	Obs	5
25%	54	67	Sum of Wgt.	5
50%	59		Mean	62.8
		Largest	Std. Dev.	11.58447
75%	67	54		
90%	81	59	Variance	134.2
95%	81	67	Skewness	.7955936
99%	81	81	Kurtosis	2.176964

 -> cohort = 3

time_dx_acp

Percentiles		Smallest		
1%	30	30		
5%	30	36		
10%	30	69	Obs	4
25%	33	74	Sum of Wgt.	4
50%	52.5		Mean	52.25
		Largest	Std. Dev.	22.45551
75%	71.5	30		
90%	74	36	Variance	504.25
95%	74	69	Skewness	-.0107968
99%	74	74	Kurtosis	1.079035

Time from ACP to death for those who died

time_acp_death

Percentiles		Smallest		
1%	24	24		
5%	24	35		
10%	24	137	Obs	3
25%	24	.	Sum of Wgt.	3
50%	35		Mean	65.33333
		Largest	Std. Dev.	62.30837
75%	137	.		
90%	137	24	Variance	3882.333
95%	137	35	Skewness	.6823944
99%	137	137	Kurtosis	1.5

time_chemo_death

	Percentiles	Smallest		
1%	16	16		
5%	16	24		
10%	16	400	Obs	3
25%	16	.	Sum of Wgt.	3
50%	24		Mean	146.6667
		Largest	Std. Dev.	219.4296
75%	400	.		
90%	400	16	Variance	48149.33
95%	400	24	Skewness	.7060496
99%	400	400	Kurtosis	1.5

time_admit_death

	Percentiles	Smallest		
1%	10	10		
5%	10	24		
10%	10	395	Obs	3
25%	10	.	Sum of Wgt.	3
50%	24		Mean	143
		Largest	Std. Dev.	218.3506
75%	395	.		
90%	395	10	Variance	47677
95%	395	24	Skewness	.7038379
99%	395	395	Kurtosis	1.5

Comparative data

Hospitalization	cohort			Total
	1	2	3	
1	13 54.17	15 62.50	8 33.33	36 50.00
2	11 45.83	9 37.50	16 66.67	36 50.00
Total	24 100.00	24 100.00	24 100.00	72 100.00

Pearson chi2(2) = 4.3333 Pr = 0.115

Code Status discharge1	cohort			Total
	1	2	3	
1	12 92.31	15 100.00	6 85.71	33 94.29
2	1 7.69	0 0.00	1 14.29	2 5.71
Total	13 100.00	15 100.00	7 100.00	35 100.00

Pearson chi2(2) = 1.9580 Pr = 0.376

code status at discharge last admit	cohort			Total
	1	2	3	
1	10 76.92	11 73.33	6 85.71	27 77.14
2	3 23.08	4 26.67	1 14.29	8 22.86
Total	13 100.00	15 100.00	7 100.00	35 100.00

Pearson chi2(2) = 0.4155 Pr = 0.812

Total hospitalizations

. regress totalhospitalization i.cohort

Source	SS	df	MS	Number of obs =	59
Model	4.06466909	2	2.03233454	F(2, 56)	= 11.19
Residual	10.172619	56	.181653912	Prob > F	= 0.0001
				R-squared	= 0.2855
				Adj R-squared	= 0.2600
Total	14.2372881	58	.245470485	Root MSE	= .42621

totalhospi~n	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
cohort						
1	0 (base)					
2	-.2142857	.147056	-1.46	0.151	-.5088743	.0803028
3	-.6369048	.1433325	-4.44	0.000	-.9240342	-.3497754
_cons	.9285714	.1139091	8.15	0.000	.7003841	1.156759

ACP conversati on	cohort			Total
	1	2	3	
1	0 0.00	5 20.83	4 16.67	9 12.50
2	24 100.00	19 79.17	20 83.33	63 87.50
Total	24 100.00	24 100.00	24 100.00	72 100.00

Pearson chi2(2) = 5.3333 Pr = 0.069

. regress time_dx_acp i.cohort

Source	SS	df	MS	Number of obs	=	9
Model	247.338889	1	247.338889	F(1, 7)	=	0.84
Residual	2049.55	7	292.792857	Prob > F	=	0.3886
Total	2296.88889	8	287.111111	R-squared	=	0.1077
				Adj R-squared	=	-0.0198
				Root MSE	=	17.111

time_dx_acp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
cohort						
2	0 (base)					
3	-10.55	11.47854	-0.92	0.389	-37.69242	16.59242
_cons	62.8	7.652357	8.21	0.000	44.70505	80.89495