

Advanced Care Planning in Nephrology Patients

St. Luke's University Health Network

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Executive Summary

The United States Renal Data System reports an unadjusted higher mortality rate in patients with end stage kidney disease and chronic kidney disease compared to those without. Dialysis patients are a group known to have an extraordinarily high mortality rate, hospital admission rate, and readmission rate, along with high-cost index. There are multiple aspects to consider in the care of these complex patients, one of which being advanced care planning, which is fundamental in their care but poorly addressed.

Review of collective data by USRDS, along with a multitude of retrospective studies, had all shown poor addressment of advanced care goals in this specific population. Mayo 2014 Clinic study reported only 35% had reported being offered supportive care without dialysis. In the last month of life, the study also revealed an alarming 69% of ESRD patients were hospitalized, 43% were admitted to the ICU, 15% received mechanical ventilation, and 42% died in the hospital.

When we started this project, we had no formal format to follow. This was brand new for our practice and our network. We started by creating a separate office encounter designed specifically to address long term goals of care, along with devising a comprehensive plan to help address issues such as renal replacement, dialysis access, code status, and reduction of hospitalizations and emergency room visits. In this way, our plan would thereby reduce network costs as well. We used Epic to create a specific advanced care planning referral order and note template for the separate ACP office visit. We also utilized our EHR system to analyze data points throughout the process. This included our metrics we wanted to measure but also our progress throughout the project including the number of referrals and completed visits. We developed a formal process from patient criteria of who would be appropriate for these visits, to the actual visit workflow, to treatment algorithms based on the patient's goals of care. We dedicated point persons in the office to lead scheduling these visits and understand the importance of them to relay this to patients. We created scripts for the office staff to follow when scheduling and discussing the ACP visits. We constantly updated our provider teams regarding reminders, education, and process improvements.

The number of ACP referrals from March 2019 to June 2021 was 229 with 76 visits completed. After analyzing the data in patients who attended the ACP visit 1 year following, we found a 17.2% decrease in ER utilization, a 24% decrease in admissions, and a significant 50% decrease in readmissions. The number of advance directives increased by 750% after ACP visit.

Define the Clinical Problem and Pre-Implementation Performance

Prior to our project, there was no performance data to compare or use as a standard of care. Our project was the first of its kind for our network. CMS presented guidelines for billing for advanced care planning however these are newer and there are no noted standard of care metrics outlined by them.

Steward

- United States Renal Data System & Centers for Medicare and Medicaid Services

Numerator

- Patients with multiple medical comorbidities including CKD/ESRD and high likelihood of worsening health status

Denominator

- Patients with chronic kidney disease or end stage renal disease referred for an advanced care planning visit.

Clinical exemption criteria

Patients who are incompetent or incapacitated were excluded from referral to ACP since they would not be able to make decisions for themselves and would not qualify to fill out the 5 wishes booklet or an advanced care directive.

For this project, there was no standard of care delineated in the past however our primary goal was to address advanced goals of care planning for our patients with underlying CKD and ESRD since this was not officially addressed in the past. Secondly, we were hoping to improve goal parameters by 15%. This included facilitating dialysis access planning and placement, reducing emergency room encounters, reducing hospitalizations, and reducing readmissions over a one-year period.

Advanced Care Planning visits lead to higher quality of life and allowing the patient's voice to be heard while they are still of sound mind. It is a service available to any of our patients. It also allows the patient a fast track into our palliative care service team if/when needed.

Design and Implementation Model Practices and Governance

The project team consisted of three main contributors. This group included Dr. Swomya Bal, Chelsea Modesto PA-C, and Danielle Fenstermaker MHA. Additionally, guidance and assistance came from the palliative care team, Epic build team, network billing team, and buy-in from other providers (nephrologists & nephrology advanced practitioners) in our group and related office staff. The organizational analytics team assisted with analyzing and compiling the data into a format which was easily accessible and readable to evaluate endpoints. Specific tasks included:

- Requesting EMR tools to improve care/workflow
 - Participating in the review and selection process
- Testing and field testing the new interventions and workflow
- Serving as a champion as part of the education, training, and implementation of the new workflow
- Participants on committees responsible for governance and change management of the underlying solutions and IT tools described in the use case

Workflow design and solution selection, testing, and field testing process

- Literature review

- Patient screening criteria created
- 5 wishes packets obtained for all offices
- Note template created
- Separate office visit created
- ACP referral order created
- ACP note type created
- Analytics Excel data sheet created
- Biweekly emailed updates of referral progress, scheduled visits, and completed visits
- Monthly email reminder to providers of upcoming appointments for patients with advanced CKD (stage 4 and 5)
- Workflow:
 - Decide which patients would benefit from an ACP meeting
 - Discuss the ACP (branded comprehensive kidney care meeting for better understanding and less anxiety about the appointment) with the patient/family
 - If patient is agreeable, place advanced care planning referral order
 - Upon checkout, office staff will give the patient the 5 wishes packet and written instructions for the visit
 - Attempt to schedule patient for ACP visit at time of next office follow up to ease the burden of care for the patient and encourage patient compliance
 - At ACP meeting, open “create ACP note” located in the advanced care planning tab for correct documentation purposes of note type in chart. Use note template (.adv) and fill in all required information. Complete serious illness conversation questions (network collaborative) and add to the end of your note with separate dot phrase (.acp).
 - Refer to palliative, hospice, or surgery as appropriate
 - Once 5 wishes packet is completed, it is scanned into the medical record and the original hard copy goes back to the patient
 - Data points were collected via the note template which providers filled out specific information about the patient and their wishes.
- Tools, resources, and timeline utilized to train clinical staff in the new clinical care workflow:
 - Practice/section meetings
 - Meetings with office staff periodically
 - Email reminders / updates to providers
 - Scripting for staff
 - Epic reporting
 - Promotional video with a patient testimonial
 - Training and reminders are ongoing as we continue to strive to make our workflow easy and replicable for other specialties in our network to follow suit

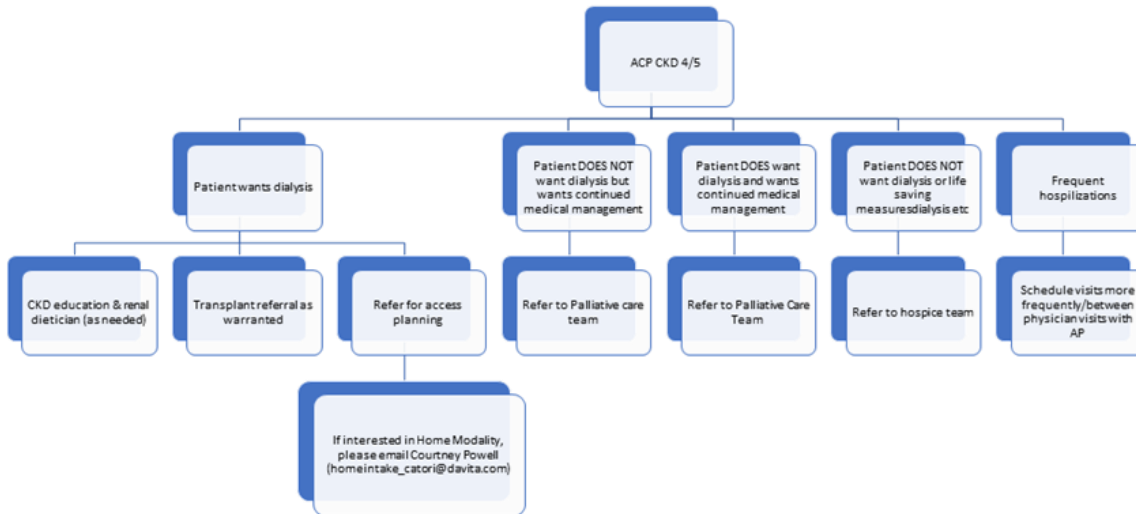
Clinical Transformation enabled through Information and Technology

Please see the below outline and flow chart identifying how to manage advanced chronic kidney disease patients and end stage renal disease patients for advanced care planning appointments.

Non-Dialysis Patients

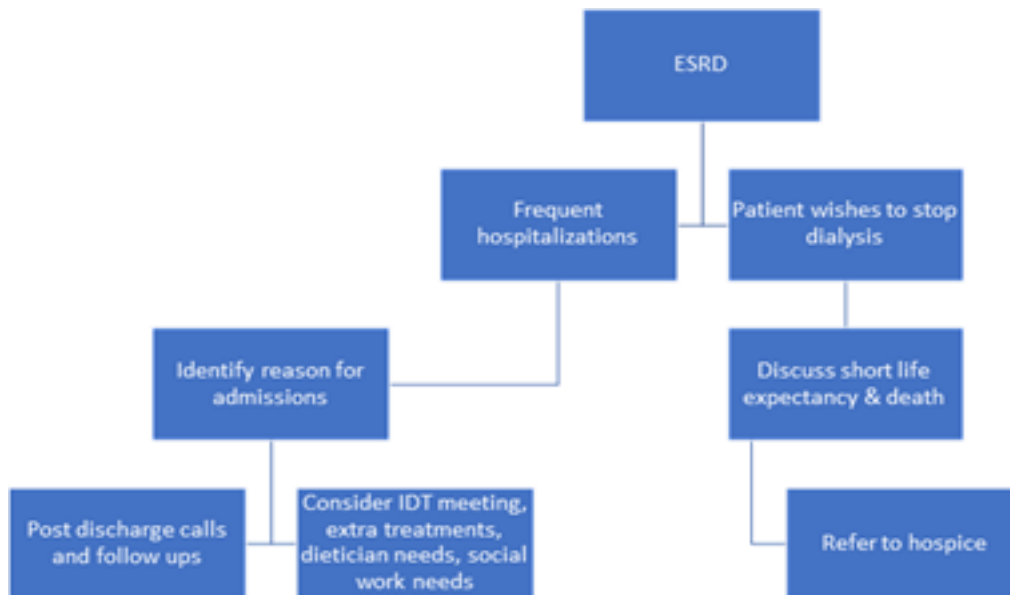
- 1.) Advanced Kidney Disease/Worsening Renal Function
 - a.) If patient wishes to pursue dialysis
 - Risks and benefits should be discussed, given their history and comorbidities
 - Refer to CKD education for modality review if not already done so.
 - Offer Renal Dietician Service to help optimize their nutrition
 - If already attended CKD education, refer for access placement Vascular Surgery/General Surgery/Interventional Radiology depending on modality choice. Include Vein Mapping order for Vascular Surgery referral.
 - If interested in home modality. Please send e-mail to homeintake_catori@davita.com. Can also set up a visit with home modality nurse if patient interested.
 - Transplant referral if applicable
 - b.) If the patient has frequent hospitalizations
 - If wishes for dialysis, follow pathway as above
 - Try to schedule visits (can be in person clinic visits/or telemedicine) in-between follow-ups with nephrologist on a continued basis to help prevent hospitalizations
 - c.) If the patient does not wish to pursue dialysis, does not want life sustaining measures, wants to be comfortable, short life expectancy, or agreeable to Hospice.
 - Refer to Hospice Team
 - d.) If patient does not wish to pursue renal replacement therapy, but continued medical management, not terminal
 - Close follow ups with AP and nephrologist to prevent hospitalizations
 - Refer to Palliative Care
 - e.) If patient is undecided
 - CKD education for modality review

- Consider tour of dialysis clinic



ESRD Dialysis Patients

- Dialysis patient with frequent hospitalizations
 - Goal is to reduce ER visits/hospitalizations. Try to identify the reasons for these occurrences (i.e., if for fluid overload, try to work with Nephrologist/Dialysis nurse for extra treatments, etc.)
 - Call to check up on dialysis patients post discharge or frequent missed treatments
- Patient wishes to stop dialysis
 - Understands consequences of stopping treatment, does not want aggressive measures. If short life expectancy and agreeable to hospice, refer to hospice. If life expectancy considered to be longer can refer to palliative care. If unsure of life expectancy, can refer to palliative care.
 - Primary nephrologist should be notified
- Discuss interest in home modality if applicable. Transplant interest as applicable if not already in process, etc.



We created a monthly Epic report which generated CKD stage 4 and CKD stage 5 patients (generated by diagnosis code) who were being seen by our nephrology group that month, sorted by provider. This helped our providers target the appropriate candidates for advanced care planning meetings. It gave the providers a reminder as well as a way to organize their pre charting prior to seeing the patient in the office that month.

We used criteria relating to the patient's history, comorbidities, goals and wishes, as well as laboratory data to select patients for these meetings. Once our patients were identified, we used the information they provided in their visits to further develop a plan of action to use during the ACP meeting. We developed a workflow to assist providers in managing these sick patients. We also reviewed their laboratory data including but not limited to creatinine and electrolytes. Below is our workflow to select, risk stratify, and manage these patients.

ESRD Dialysis Patients

- a.) Dialysis patient with frequent hospitalizations
 - Goal is to reduce ER visits/hospitalizations. Try to identify the reasons for these occurrences (i.e., if for fluid overload, try to work with Nephrologist/Dialysis nurse for extra treatments, etc.)
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hospice, refer to hospice. If life expectancy considered to be longer can refer to palliative care. If unsure of life expectancy, can refer to palliative care.

- Primary nephrologist should be notified
- c.) Discuss interest in home modality if applicable. Transplant interest as applicable if not already in process, etc.

We utilized a template office note specific for these visits, created specifically by us for our patients. We were able to tailor this to our needs as a nephrology practice but also left room for open ended documentation. In addition, we created a referral order for the advanced care planning meeting. This helped to track these meetings and collect data from the patient charts.

1 2 3 4 5 6 7 8 9 10 11 12 13

NEPHROLOGY ADVANCED GOALS OF CARE MEETING
@NAME@ @AGE@ @SEX@ MRN: @MRN@
@TD@

ASSESSMENT and PLAN:

I had the pleasure of seeing @NAME@ today in the renal clinic for discussion of the patient's goals of care. Our discussion today will focus on helping *** achieve their desired goals, long term goals of care and how best to achieve those goals. The participants during this visit include ***.

Kidney Smart Class: {Kidney Smart:31650}
Would Pursue Dialysis if Needed: {Would Pursue Dialysis or Not:31652}
Dialysis Access: {Dialysis Access Type:31651}
Advance Directive: {Advanced Directive:31653}
Five Wishes Packet: {Five Wishes Packet:31654}
Code Status: {Code Status:31655}
POA: ***
Do they need to be referred to Palliative Care: {Referred to Palliative Care or Not:31658}
Do they need to be referred to Hospice: {Hospice Referral:31659}
Length/Time of Meeting: {Length of Meeting:31665}
Outpatient Nephrologist: {Outpatient Nephrologist:31666}

Discussion and Plan:

REVIEW OF SYSTEMS:

@ROSBYAGE@

Medications:
@MEDSCURRENT@

We utilized a network wide set of questions called the serious illness conversation (SIC) and added this into our note template as well.

Serious Illness Conversation

I'd like to talk about what is ahead with your illness and do some thinking in advance about what is important to you so that I can make sure we provide you with the care you want — is this okay?"

1. What is your understanding now of where you are with your illness?

Prognostic Understanding	no understanding of prognosis	overestimates prognosis	appropriate understanding of prognosis	underestimates prognosis
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Insert SmartText 100%

2. How much information about what is likely to be ahead with your illness would you like to have from me?

FOR EXAMPLE: Some patients like to know about time, others like to know what to expect, others like to know both.

Information	patient wants to be fully informed	patient wants to be informed of big picture, but not details	patient wants some information, but no "bad news"
	patient does not want any information for him/herself		

Insert SmartText 100%

I want to share with you my understanding of where things are with your illness

3. What did you (clinician) communicate to the patient?

Prognostic Communication	Uncertain - It can be difficult to predict what will happen with your illness. I hope you will continue to live well for a long time but I'm worried that you could get sick quickly, and I think it is important to prepare for that possibility.
	Time - I wish we were not in this situation, but I am worried that time may be as short as *** (express as a range, e.g. days to weeks, weeks to months, months to a year).
	Function - I hope that this is not the case, but I'm worried that this may be as strong as you will feel, and things are likely to get more difficult.

Insert SmartText 100%

4. If your health situation worsens, what are your most important goals?

FOR EXAMPLE: Being at home, being mentally aware, being in control of decisions, not being a burden, achieving life goals, supporting my children.

Goals	achieve particular life goal	be at home	be emotionally at peace	be independent
	be mentally aware	be physically comfortable	be spiritually and emotionally at peace	be spiritually at peace
	have my medical decisions respected	live as long as possible, no matter what	not be a burden	provide support for family

Insert SmartText 100%

5. What are the biggest fears and worries about the future and your health?

Fears/Worries	ability to care for others - children, ill spouse	being a financial burden	being a physical burden	being alone
	being an emotional burden	being dependent	burdening others	choking or suffocating
	concerns about the meaning of life	emotional concerns	finances	getting treatments I do not want
	loss of control	loss of dignity	loss of mobility	other family concerns
	other symptoms	pain	preparing for death	rejection
	spiritual distress			

Insert SmartText 100%

6. What abilities are so critical to your life that you cannot imagine living without them?

Unacceptable Function	being chronically confused or not being myself	being in chronic severe pain
	being in pain or very uncomfortable	being unable to communicate effectively
	being unable to interact with others	being unable to talk
	being unconscious	not being able to care for myself, including toileting and feeding
	not being myself	

Insert SmartText 100%

7. What gives you strength as you think about the future with your illness?

8. If you become sicker, how much are you willing to go through for the possibility of gaining more time?
 FOR EXAMPLE: Being on a machine, being in hospital or ICU, having a feeding tube.

Be in the hospital	Yes	No	Have a feeding tube	Yes	No
Be in the ICU	Yes	No	Live in a nursing home	Yes	No
Be on a ventilator	Yes	No	Be uncomfortable	Yes	No
Be on dialysis	Yes	No	Undergo aggressive test and/or procedures	Yes	No

9. How much does your proxy and family know about your priorities and wishes?

Discussion	does not want family informed	extensive discussion with family about goals and wishes	no discussion, wants help in talking to family
	no discussion but plans to address these issues	some discussion but incomplete	wants clinician to talk with family

Advanced directives

Five Wishes	Patient has Five Wishes in chart	Patient has Five Wishes, not in chart	Patient does not have Five Wishes- would like information
	Patient does not have Five Wishes- would not like information		

Closing the visit

Listening and Understanding

I've heard you say that "" is really important to you. Keeping that in mind, and what we know about your illness, I recommend that we "". This will help us make sure that your treatment plans reflect what's important to you.

How does this plan sound to you? I will do everything I can to help you through this.

Patients understanding of the plan

Patient verbalized understanding of the plan	Patient wants to finish this discussion at a later time
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Thank you for spending the time today and sharing all of your thoughts with me.

I have spent ""minutes speaking with my patient on advanced care planning today or during this visit

Notes

Advance Care Planning Notes

This patient has no ACP notes on file.

Create ACP Note

Close

We utilized a nationwide document called 5 Wishes to help patients document their wishes in the form of an advanced directive that is free of charge for patients. This document consists of a POA, life support measures, and comfort measures. It is signed by the patient and two witnesses and is honored as a legal document in 42 states.

Training for our providers was not needed for the Epic interface as our network has been using this for many years. We did educate providers on talking points for these meetings including how to address the topic prior to the actual advanced care planning visit which included rebranding the name to "comprehensive kidney care meeting". We also provided scripts to help them familiarize themselves with the SIC questions. Some of us attended a webinar to also further our knowledge on how to discuss this difficult topic with patients.

Identify any points through the timeline of the project where the standard of care changed, and the corresponding changes to information and technology enabled clinical care processes, clinical guidance, etc.

- Throughout our project, we had to adjust our ACP standard of care a couple times. We adjusted the template used for the ACP visits to capture the data we wanted to measure as well as make sure we did not collect unnecessary data. We also created a separate order in Epic, separate visit type in Epic, and eventually (due to COVID) used telemedicine for these encounters. We also added the serious illness conversation questions (see above) once the network gave ACP visits a higher focus.

In the future, we plan to utilize an end of life predictive model which is an algorithm developed by Epic to determine the mortality of the patient in the next year. This can be utilized inpatient or outpatient. However, this was just recently initiated at St. Luke's University Health Network, and we do not have access in the ambulatory setting to utilize this tool yet but have come up with a workflow to do so in the near future once it is built into our ambulatory patient setting. Currently it is available in the inpatient setting only.

No technology was used in this way. Our project focused on the ability to understand the patient's goals of care, quality of life, and allow patients to understand their options and record them in writing so their wishes could be followed even when the patient was unable to communicate them themselves.

Improving Adherence to the Standard of Care

Our primary goal was to address advanced goals of care planning for our patients with underlying chronic kidney disease (CKD) and End Stage Kidney Disease (ESKD), a group known to have high disease burden and mortality rate. In conjunction with this, patient education would be provided during these advanced care planning visits.

The majority of our primary goals, which were all designed to ultimately lead to improved patient quality of life and care were met. The total number of referrals was 229 (from March 2019 through June 2021) with 76 visits completed thus far. The number of referrals has fluctuated but overall has shown growth since its inception (graph 1).

Secondary goals were to facilitate dialysis access placement by providing additional patient education during ACP office visits, reduce the number of emergency room encounters, hospitalizations, and readmissions over a 1-year period. Our targets were to increase nephrology advance care meetings by 15%, facilitate increased dialysis access placement by 15%, and reduce emergency room utilization and readmissions by 15%.

CMS recently set a standard of care for certain requirements surrounding ACP and our

network and practice follow those guidelines closely. This relates to billing as well as goals of the meeting.

We utilized our EHR system to capture patient data which was found from our note template and inputted by the provider directly. This was based on chart review, patient history, and patient desires/goals. We also utilized data from one-year pre and post the visit which was obtained from the EHR system itself.

Improving Patient Outcomes

The number of emergency room utilization decreased by 17.2% one year following ACP visit (graph 3). The number of admissions decreased by 24% (graph 4), and readmissions were significantly decreased by 50% following ACP meeting (graph 5). The number of completed of 5 wishes packets increased by an astounding 750% after an ACP visit (graph 2). The ACP order to actual visit conversion rate improved to 33%.

- Graph 1**



ACM Orders
March 2019 – June 2021



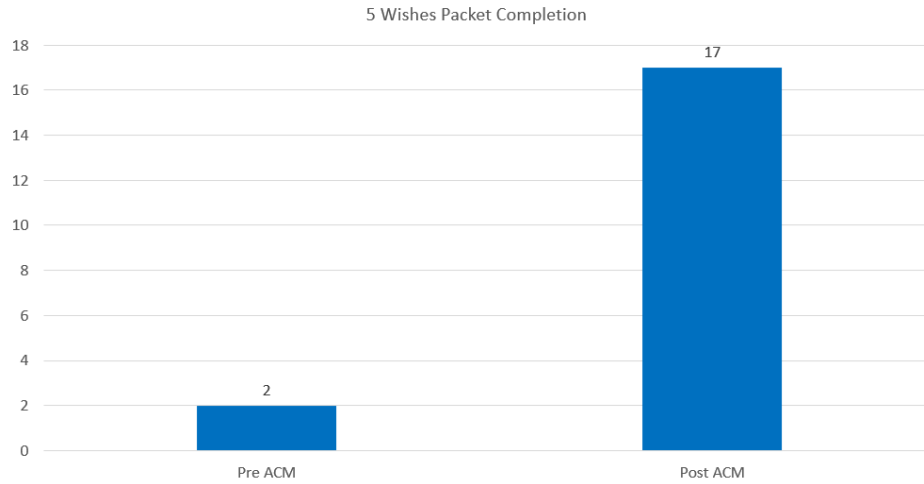
Includes all patients that received an order for an ACM meeting.

- Graph 2**



5 Wishes Packet Completion Pre/Post ACM

All patients having 5 Wishes Packet completed



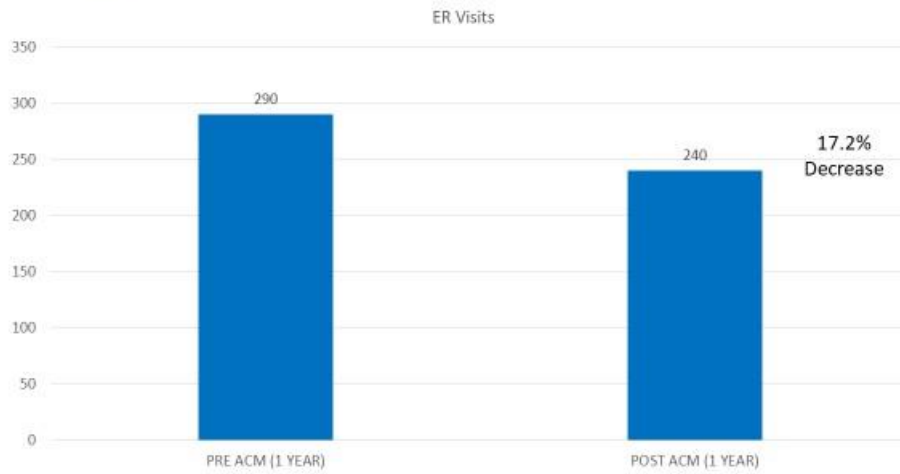
Includes all patients with a completed 5 Wishes Packet. Pre ACM are those who completed before their ACM visit. Post ACM are those who completed after their ACM visit.

- Graph 3**



ER Visits Pre/Post ACM

All patients with a completed ACM visit



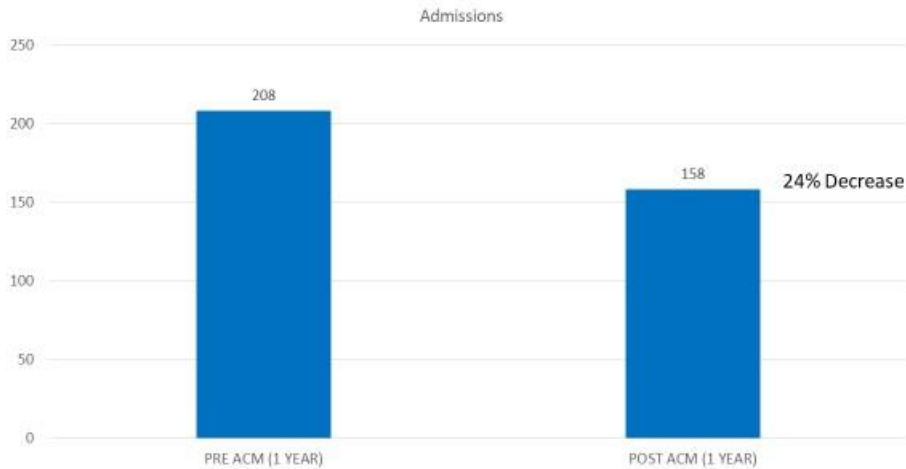
Includes all patients that had an ACM meeting and their ER visits 1 year pre and 1 year post their ACM visit.

- **Graph 4**



Admissions Pre/Post ACM

All patients with a completed ACM visit



Includes all patients that had an ACM meeting and their inpatient encounters 1 year pre and 1 year post their ACM visit.

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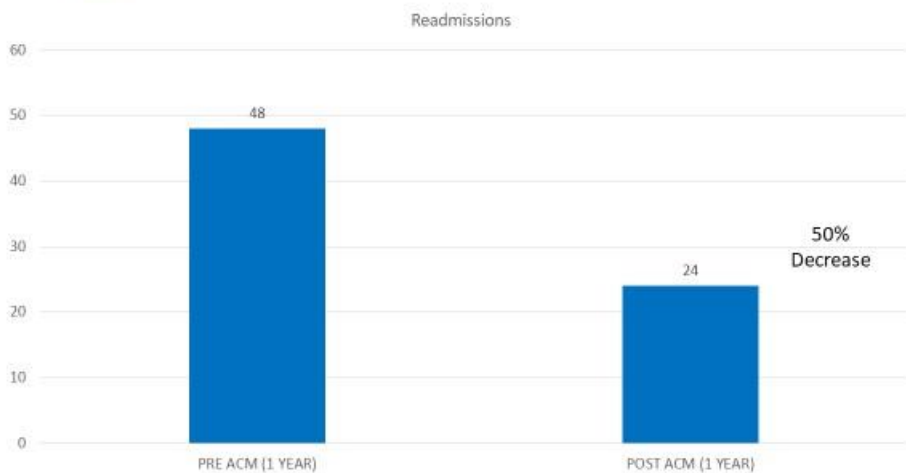
Analytics: M. Adams
Data Source: Insights EDW
07/15/2021 3

- **Graph 5**



Readmissions Pre/Post ACM

All patients with a completed ACM visit

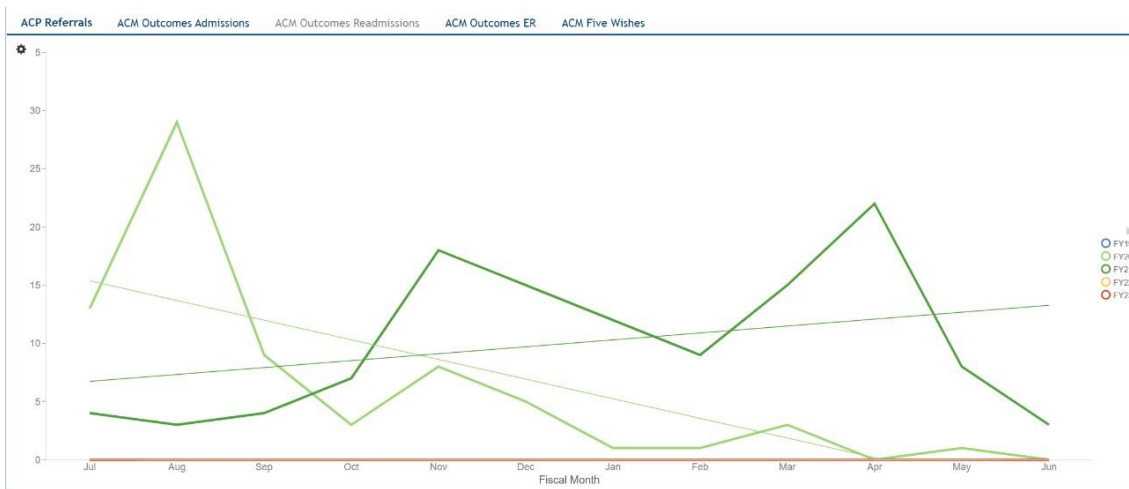


Includes all patients that had an ACM meeting and their readmissions 1 year pre and 1 year post their ACM visit.

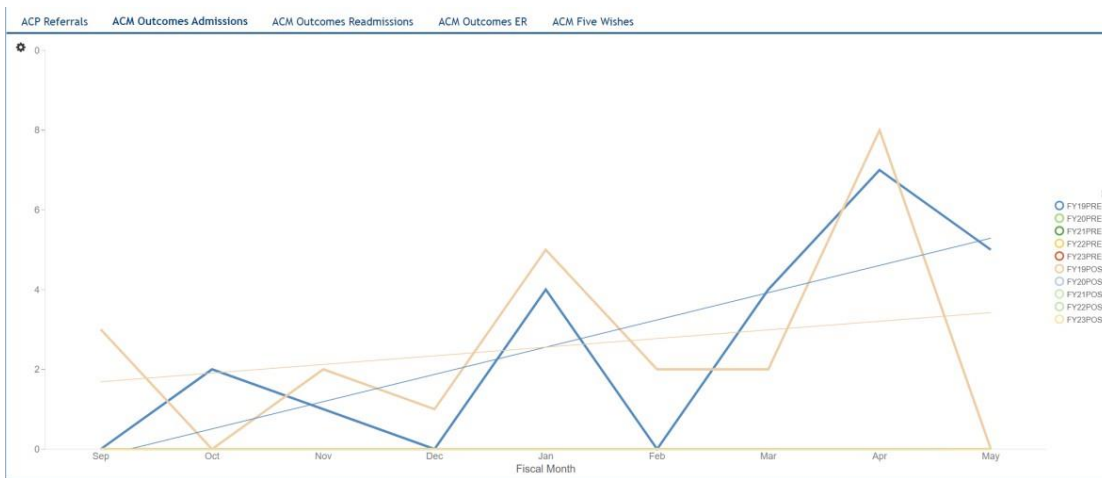
St. Luke's University Health Network

Analytics: M. Adams
Data Source: Insights EDW
07/15/2021 5

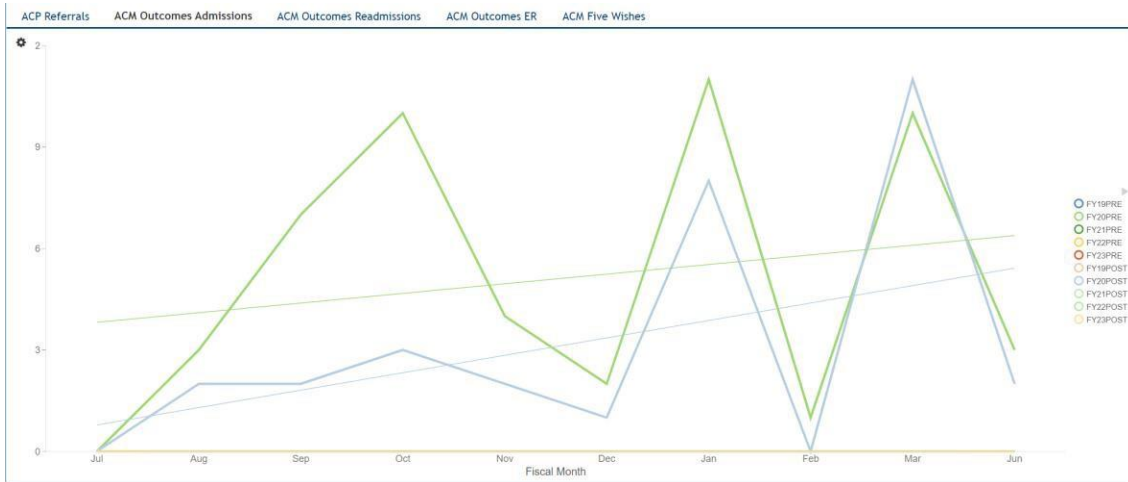
The chart below shows the ACP referrals increasing from fiscal year 2020 to 2021.



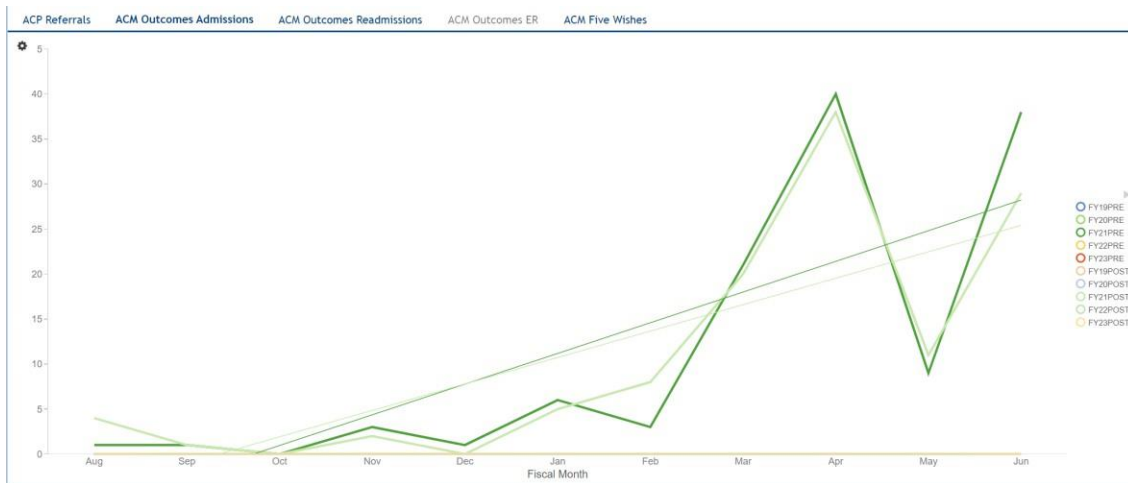
The chart below shows the decreased rate of admissions after an ACP visit in 2019.



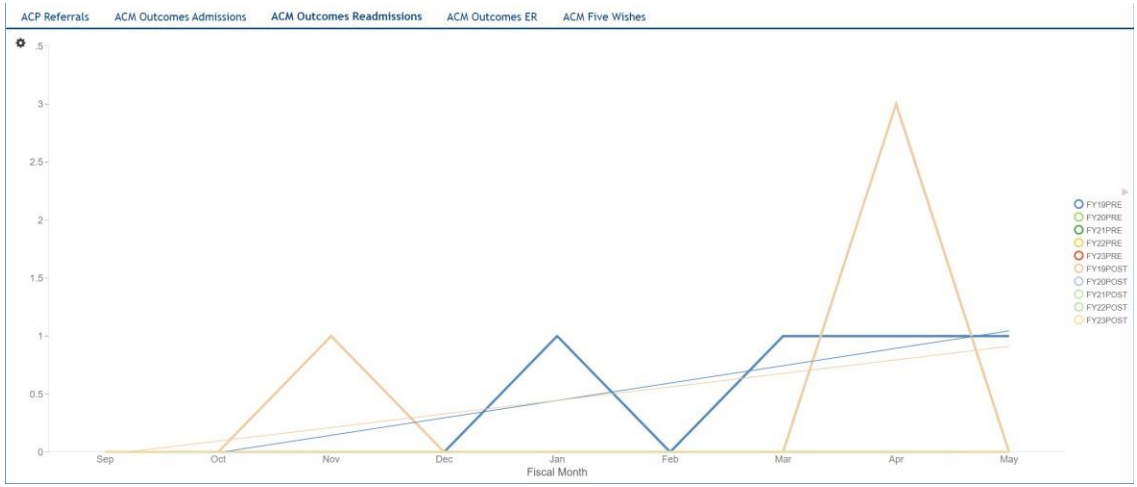
The chart below shows the decreased rate of admissions after an ACP visit in 2020.



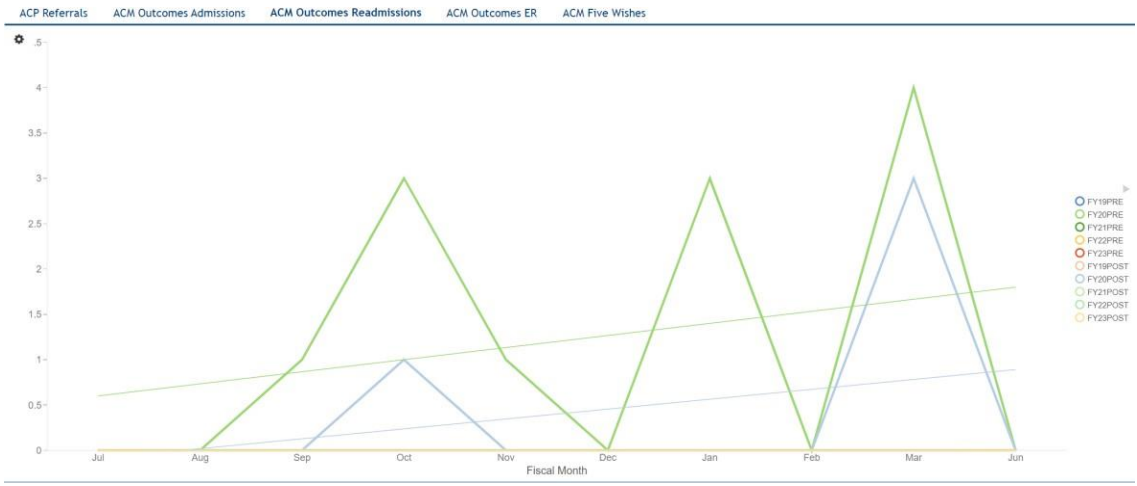
The chart below shows the decreased rate of admissions after an ACP visit in 2021.



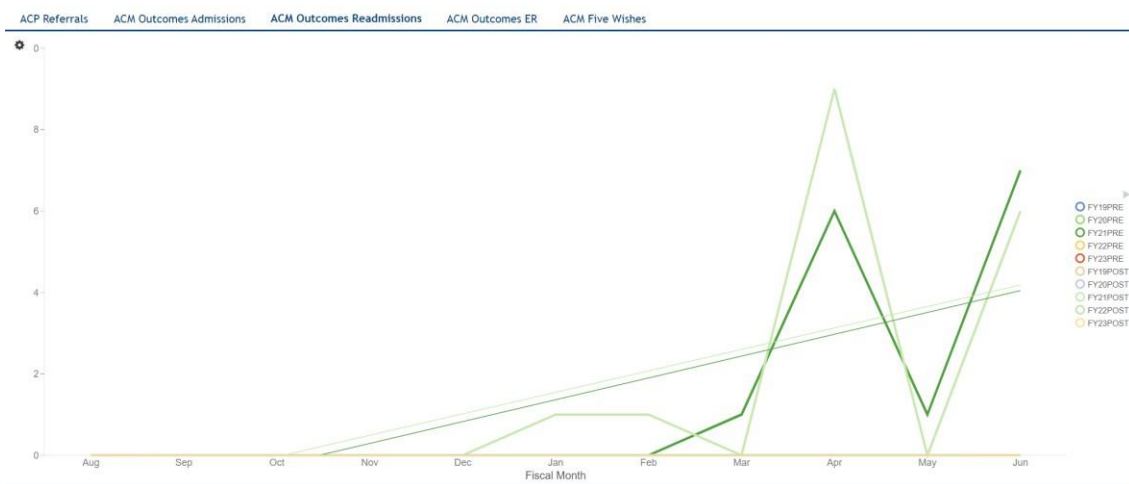
The chart below shows the decreased rate of readmissions after an ACP visit in 2019.



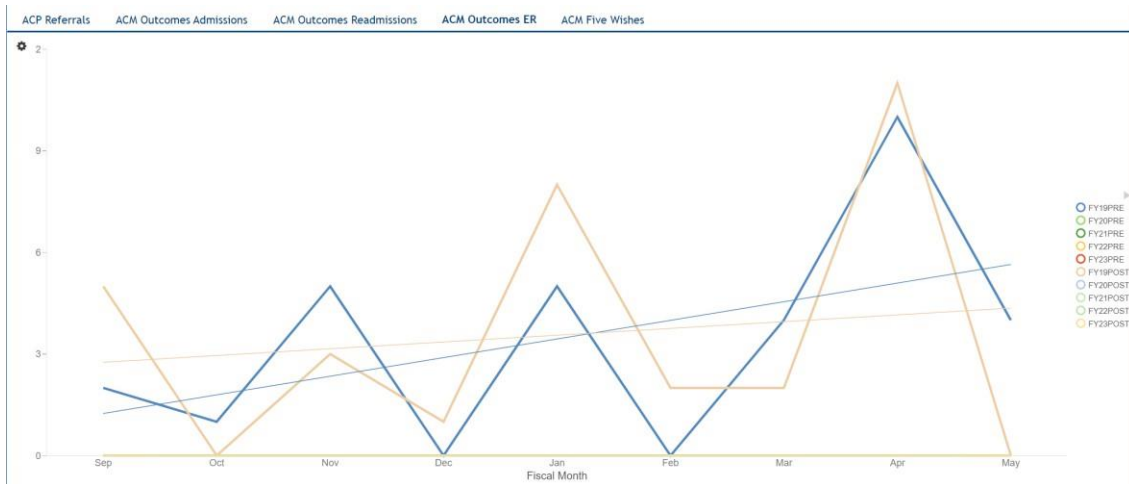
The chart below shows the decreased rate of readmissions after an ACP visit in 2020.



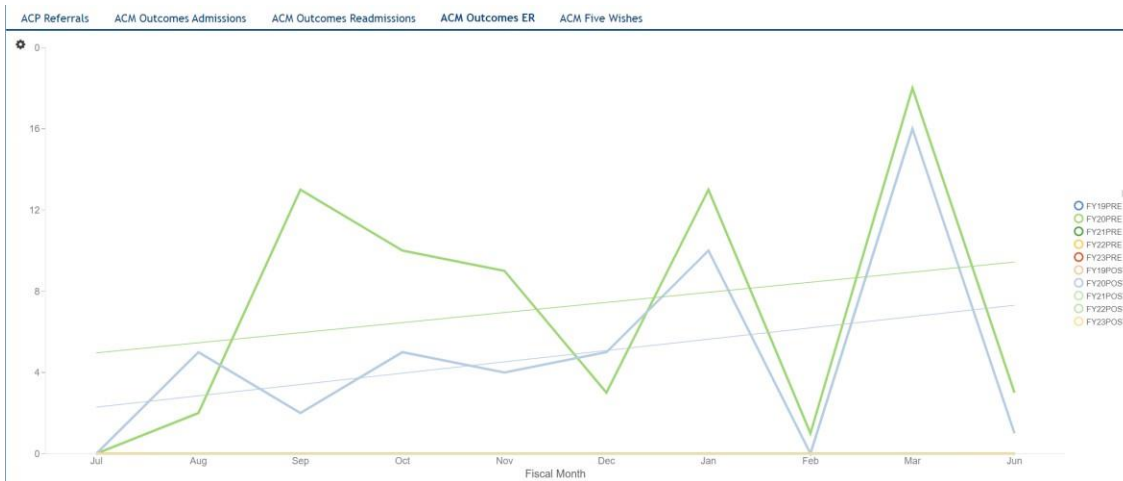
Unfortunately, in fiscal year 2021, the chart below shows a slightly increased rate of readmissions after an ACP visit.



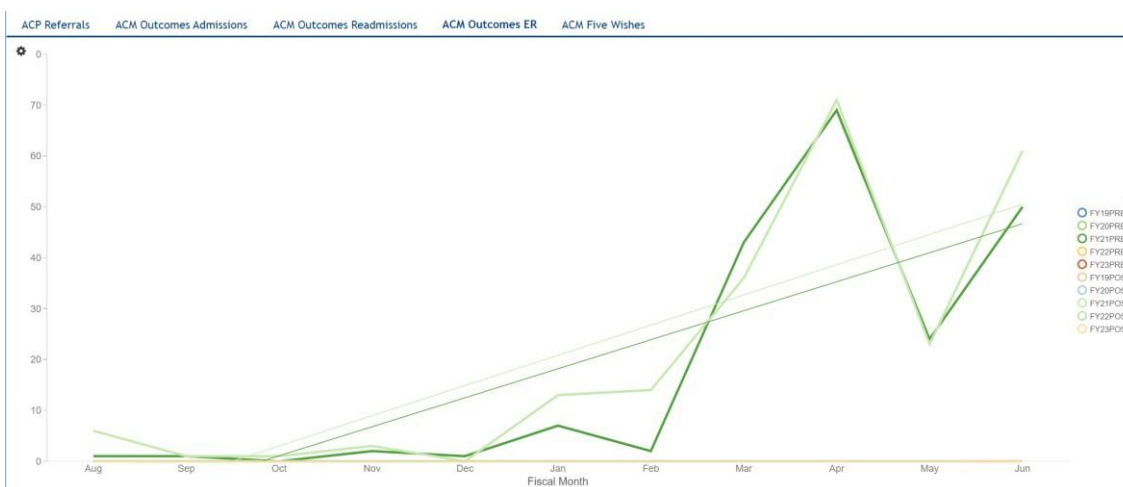
The chart below shows a decreased rate of ER utilization after an ACP visit in 2019.



The chart below shows a decreased rate of ER utilization after an ACP visit in 2020.



The chart below shows a slightly increase in ER utilization after an ACP visit in fiscal year 2021.



Accountability and Driving Resilient Care Redesign

Identify any analytics tools utilized to provide real time/close to real time performance data to providers in order to identify gaps in care and opportunities for improved care delivery.

Our team utilized Epic EHR to collect the raw data and a program called INSIGHTS where data was compiled by our analytics team. We also received biweekly emails with referral count, scheduled patient visits, and completed patient visits. This way we were able to manually track if any new patients could be scheduled and make sure all were being scheduled in a timely manner.

We were constantly trying to improve our process and metrics throughout our project. This was mostly by manual tracking and labor intensive. As stated above, we did utilize biweekly emails which allowed us to stay on top of new referrals. We utilized spread sheets and updated them accordingly.

Unfortunately, our office had a few setbacks in scheduling patients due to COVID, providers being on leave, and the acuity of our patients for regular or hospital follow ups which we prioritized in the office schedule due to the acuity of their illnesses. Therefore, our advanced care planning visits often took a backseat to these more pressing patient issues. Since we recognized the importance of the ACP meetings, we were always trying to improve our process and fit patients in soonest available. Another setback was trying to make sure patients understood the importance of the ACP visit and wanted to schedule it. We listened to patient feedback and attempted to schedule this at the same time as their normal follow up visit to lessen the burden of travel to the office on the patient. This effectively created one office visit for the patient instead of two.

Due to biweekly emails regarding patient referrals, scheduled pending visits, and completed visits, we were able to stay on top of incoming referral numbers and which providers were ordering and were not ordering ACP referrals. We used this information to further educate our provider group with reminders and open-ended options for any questions they had about ACP process and visit. We attempted to make the process as easy and seamless for providers as possible. We updated the front desk staff and called patients individually to remind them of the appointment and provide further instructions for the visit. We placed educational materials in all exam rooms. We were also invited to join our network's ACP initiative group meetings to help share our success and provide insight.

To make the initiative of improved ACP uptake repeatable for the rest of the network, additional identification and stratification criteria, EMR mechanisms, educational components, and subsequent workflows were created. There was expanded provider education on SIC conversations, smart lists driven by predictive analytics scores were created, and increased visibility of predictive analytics scores was completed.

Serious Illness Conversation

- A core group of Providers both inpatient and ambulatory were trained in SIC through a program created by Ariadne Labs. This is a "train the trainers" program which includes Standardized Patients for practicing conversations as well as engaging in conversation modeling. This standard curriculum has been integrated into the Graduate Medical Education program.
- The SmartForm in the EMR to facilitate and document Serious Illness Conversations was used to generate an ACP note which is easily discoverable in the chart.

Author	Encounter Type	Encounter Date	Provider Specialty	Note Type	Status	Trans Type
	Office Visit	Today	Family Medicine	Progress Notes	Unsigned	
Me	Office Visit	Today	Family Medicine	ACP (Advance Care...)	Incomp...	

- ACP Billing for Ambulatory patients guide was also added to provider education to remove ambiguity surrounding which CPT codes can be used.

Identification of Inpatient High-Risk Patients

- End-of-Life Score (EOL) column in both patient lists and located on Storyboard.

Example of DI and EOL on Inpatient Storyboard:

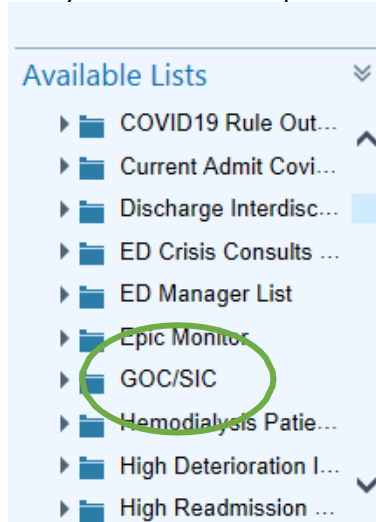
Systemsummary Clindoc
 Male, 57 y.o., 1/6/1965
 MRN: 50005008729
 Bed: BE ICU-ICU 05
 Code: Level 1 - Fu (no ACP docs)
 Health Care Proxy: Not Active
 DI, EOL: 16, 3
 Campus: St. Luke's University Hospital - Bethlehem Campus

Blood Product Refusal: None
 My Pat List Reminders: None +
 Risk of Unplanned Readmission Score Column: 12
 COVID-19 Vaccine: Unknown

Example of EOL (DI not applicable to ambulatory patient visits):



- A GOC/SIC (goals of care/serious illness conversation) Smartlist automatically populates for review by case management. This list consists of patients with an EOL score of 45 or higher and case management uses this list during daily multidisciplinary huddles while patients are admitted to the hospital.



- Pre-existing Deterioration Index (DI) displayed next to EOL Score on the Storyboard
 - The purpose of the EOL Index model is to assesses the one-year mortality risk for patients and assist in identifying patients that would benefit from end-of-life care for staff to connect with them to discuss their goals, wishes, and care options.
 - The EOL score's urgency is supplemented by another predictive analytics score called the Deterioration Index (the DI score). The DI score focuses on patient deterioration while admitted. The DI score is used exclusively on the inpatient side and is much more dynamic of a score as it fluctuates as vital signs, labs, and nursing assessments occur much more frequently in the IP setting.
 - If a patient has a high EOL score AND a high DI score, this will increase the level of urgency clinicians may have in talking to a patient about advance care planning.
 - EOL Index and DI score are two different predictive analytic scores that complement each other quite well for identifying and stratifying the population of patients in need of ACP.

Example of what End of Life Care index is comprised of:

End of Life Care Index

[View model formula and coefficients](#)

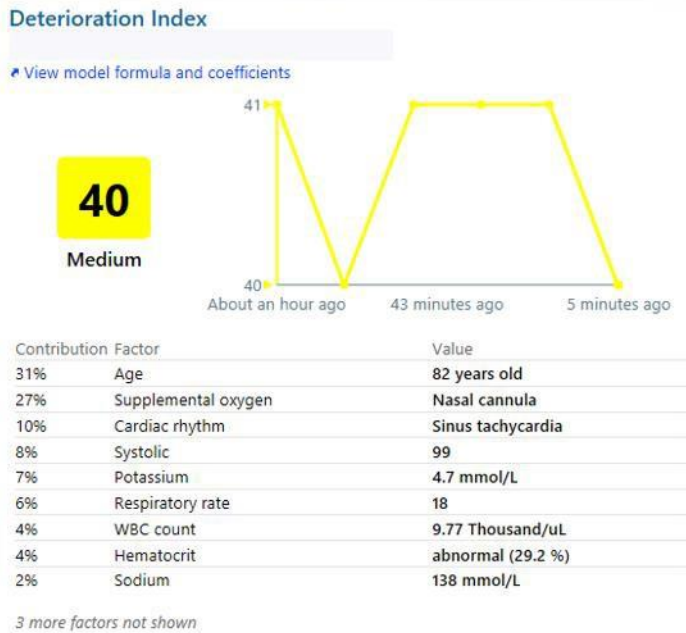
This score indicates a patient's risk of mortality in the next year. This hover bubble only shows the primary risk factors and diagnoses that contribute to the score.

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High Risk

Factor	Value
Age	82
Has Medicaid	No
Sex	Male
Prescribed Albumin (Human)	No
Prescribed Antineoplastic	No
Prescribed Antipsychotic	No
Prescribed Cardiotonic	No
Prescribed Corticosteroids	No
Prescribed Phosphorus Binder	No
Prescribed Potassium Removing Resin	No
Has Fluid or Electrolyte Disorder	Yes
Has Coagulation or Hemorrhagic Disorder	Yes
Has Peri-, Endo-, or Myocarditis, or Cardiomyopathy (Not from TB or STD)	Yes
Has Coronary Atherosclerosis or Other Heart Disease	Yes
Has Nonhypertensive Congestive Heart Failure	Yes
Had Acute Cerebrovascular Disease	Yes
Has COPD or Bronchiectasis	Yes
Has Respiratory Failure, Insufficiency, or Arrest	Yes
Has Screening or History of Mental Health or Substance Abuse Codes	Yes

Example of what Deterioration Index is comprised of:



Example of how these scores appear to Providers on Patient Lists:

Admit Req Doc	Bed/ Location	Level of Care	Actual Length of Stay (Days)	End of Life Care Index	Deterioration Score
✓	S MS 416-01 AN MRI	Med Surg	4	58	18 10 hrs 36 mins
✓	S MS 434-01 APU	Med Surg	4	10	19 49 hrs 33 mins
✓	S MS 425-01 S MS 425-01	Med Surg	2	63	27 43 hrs 42 mins
✓	S MS 426-01 PACU	Med Surg	8	52	34 43 hrs 44 mins
✓	S MS 421-01 S MS 421-01	Med Surg	4	21	19 48 hrs 23 mins
⚠	S MS 413-01 S MS 413-01	Med Surg	7	76	34 10 hrs 36 mins
⚠	S MS 419-01 S MS 419-01	Med Surg	1	25	36 16 hrs 37 mins
⚠	S MS 422-01 AN IP DIALYSIS	Med Surg	4	42	24 Never reviewed
⚠	S MS 412-01 AN CT SCAN	Med Surg	5	10	22 13 hrs 20 mins
⚠	S MS 433-01 S MS 433-01	Med Surg	4	19	40 49 hrs 33 mins

Identification of Ambulatory High-Risk Patients

- Pursuit lists are currently under development to be used in the Ambulatory space.
- EOL Score is currently available to all PCPs and specialties.
- Primary care quality scorecard currently under development.