Schulich
MEDICINE & DENTISTRY

RESIDENT PROJECT – QUALITY IMPROVEMENT
FAMILY MEDICINE, WESTERN UNIVERSITY

This document will walk you through the steps of completing a Quality Improvement (QI) project.
QI projects will focus on your family medicine home centre and will be an issue that involves or affects patient care.

	Resident Name	Faculty Advisor Name	Family Medicine Site [ie. SJFMC, Hanover]	Indicate one Faculty Advisor as Project Lead
1	Matthew Brockman	Dr. Dale Ziter	Windsor	
2	Jessica Davie	Dr. Helena Hamdan	Windsor	Dr. Helena Hamdan
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Provide the following information for the final writeup. [Not needed for proposal submission]	
Title of project	Approach to improve smoking cessation in the primary care setting.
Abstract [less than 250 words]	Approximately 1 in 5 Canadians aged 12 to 79 years continues to use tobacco despite the negative effects it has on overall health. It is a major contributor of preventable causes of death including cancer, cardiovascular disease, COPD, etc. Using tobacco is a highly addictive behaviour, and physicians can help double or triple their patients chances of quitting with counselling. However, smokers typically do not actively seek assistance for smoking cessation from their family physicians unless they are ready to quit. Subsequently, family physicians often do not breach the subject unless they feel the patient is ready. This quality improvement project will implement new strategies to encourage patients to actively seek counselling for smoking cessation from their family physician. The strategies employed in this QI project are a poster advertisement and a tobacco use survey. The results of our QI project show that patients do not typically make appointments specifically for smoking cessation. Additionally, it did not influence our process and balance measures; increasing documentation of smoking habits and number of quit aids prescribed or primary care physician satisfaction, respectively. Through the use of Shewhart charts, our data reflects that the use of a poster and tobacco survey did not significantly change the frequency of initial smoking cessation counselling. However, distribution of the

	tobacco survey did appear to eliminate special cause variation and subsequently introduced stability into an otherwise unstable process. This intervention was relatively simple to implement, but was somewhat time-consuming for the staff involved. In light of both these pieces of evidence, one could conclude that intermittent tobacco survey use could ensure regular, predictable, effective smoking cessation counselling in the primary care setting.
Preference for presentation type at Resident Project Day [June PGY2] [Poster or Oral presentation]	

---1 -- BACKGROUND--

1.1 - Each resident within group to describe a clinical event that did not go as planned.
What were personal characteristics that contributed? What were system characteristics that contributed?

Jessica: With a busy work schedule and multiple patients to see everyday, it is often difficult to find time to approach smoking cessation with patients who are not actively seeking assistance. Usually, these patients visit the office for other complaints and an opportunity to discuss their tobacco use and what we can offer to help them quit is missed. I have noticed over the years of training, that most smokers do not initiate conversation regarding their smoking habits and they are even less likely to make appointments specifically to discuss smoking cessation. I have come to the realization that as a physician, it will be up to me to encourage my patients to quit smoking at each and every visit. Most of the patients that I have spoken to about quitting thus far understand the risks of smoking and the benefits of quitting, however they seem to lack the motivation and support to quit. I have made an honest effort to discuss smoking cessation as much as possible, however, I have not gone as far as encouraging follow up for smoking cessation to further provide support and motivation.

Matthew: A family physician's primary role lies in preventative care. As such, family physicians pride themselves in being able to intervene before patients develop preventable (and often irreversible) pathology. One particular clinical encounter that stands at the forefront of my mind when I think about smoking cessation occurred during my core family medicine rotation during my PGY1 residency year. A patient presented with a chronic cough, and as a lifelong smoker, was sent for the appropriate work up including a pulmonary function test. The results were indicative of early COPD, a complication many life long smokers eventually develop. The patient was horrified to hear this news, as she watched countless close friends and family members suffer with (and even die) from complications related to this debilitating, irreversible disease process. She declared immediately that she would quit smoking permanently (especially after we explained that this was one of the only ways to improve overall mortality from COPD). Thankfully, this patient stuck to her word, and has indeed quit smoking! However, I reflect on this encounter and think to myself, "Why did she have to wait until she developed a chronic, life-altering diagnosis before she would make the necessary changes to protect her health?" Anecdotally, this is often the case: cigarette smokers refuse to quit until it is too late. Although the onus ultimately lies on the patient's personal choices, we must acknowledge that as a system, we frequently fail to adequately address lifestyle choices that greatly impact our patients' health. Not only do we miss opportunities to help educate these patients during routine visits (whether it be due to busy schedules, burn out, lack of motivation or simply forgetting to do so), but we are too often passive in our approach to smoking cessation. As physicians we have the duty to be receptive to our patient's needs and questions, and also to go out of our way to engage our patients in their health. As such, through this quality improvement project my partner and I propose a more creative, engaging approach to smoking cessation in hopes of increasing the number of patients booking formal, office-based visit to discuss their nicotine addiction.

1.2 - Describe a problem or gap within your clinic. Describe context. What is the baseline level of the problem? [Provide a quantitative, measured baseline value from your clinic]

The issue with our clinic is that patients are not actively broaching the topic of smoking cessation, and often are reluctant to discuss this issue altogether. Consequently, we as physicians are not regularly initiating discussions regarding smoking habits, for reasons including time constraints, discouragement after repeated failed attempts and occasional emotional backlash from patients. Therefore an opportunity is missed to discuss this extremely important preventative measure and encourage motivation and provide support. This quality improvement project will aim to improve the number of discussions regarding smoking cessation in two family medicine practices, within a single FHO. Combined, these two practices have a total of 386 (8.4%) patients that are identified as smokers. Over the last 12 months, 273 (71%) of these identified smokers booked appointments with their primary care physician. Surprisingly, zero smokers specifically made an appointment to discuss smoking cessation. However, of these patients who booked appointments, 263 (96%) had documented discussions containing the phrases "smoking cessation", or "smoking" and "quit", or "cigarette". These primary care physicians billed

OHIP for 43 "initial smoking cessation counselling appointments", which may represent discussions made during appointments for other reasons. These doctors billed OHIP for zero "smoking cessation follow up appointments". Therefore, it appears that although zero appointments were made to specifically discuss smoking, initial formal smoking cessation counselling was done in approximately 11% of smokers.

1.3 - Describe literature search strategy [databases/keywords] Summarize literature relating to problem [Written in your own words with proper citations, min 5 references]

For our literature search, we will primarily be using the PubMed database. Keyword searches will include; smoking cessation, tobacco use, counselling, smoking, mortality and morbidity rates in the setting of family medicine/primary care and involving family physician/family doctor. Any data or articles published before the year 2000 and not written in the English language will be excluded from our search. Canadian statistics and adult literature only will be used.

Approximately 1 in 5 Canadians aged 12 to 79 years continue to use tobacco despite the burden it has on their overall health[1]. Smoking is a major contributor of preventable causes of death including cancer, cardiovascular disease, COPD etc. In Canada, 100 people die per day due to smoking related illnesses. This accounts for 17% of all deaths in Canada (20% in males, 12% females). In 2002, 831 adult deaths and 100 infant deaths were attributable to second-hand smoke related illnesses (cardiac/respiratory and SIDS/prematurity respectively).[2] In addition to increased morbidity and mortality, the cost of smoking-related illnesses on our health care system is overwhelming. In 2013, the average smoker cost the health care system a total of $3071. The national total was over $18.7 million.[3]

The benefits of quitting are well known to clinicians and tobacco users. Smoking cessation reduces all-cause mortality. Specifically, after one year of being smoke free, patients have a 50% less risk of developing heart disease.[4] After 5-15 years of abstinence, the risk for developing lung cancer is also reduced by 50% and the risk of dying from lung cancer is equal to that of a non-smoker.[5]

It is no secret that smoking tobacco is a highly addictive behaviour. A study conducted in 2006 reported that approximately one third of smokers intended on quitting in the immediate future and approximately 50% had tried to quit smoking within the last year.[6] Among those patients who attempted smoking cessation, most of them did not use any form of cessation aid. This is an important consideration as smokers who use a formal cessation method are less likely to relapse compared to smokers who attempt to quit on their own.[7] Additionally, it has been shown that evidence based treatments for smoking cessation can double or triple the rates of cessation.[8]

Many studies have researched the role of the family doctor in smoking cessation and it has been shown over and over again that even brief advice given to the patient significantly increases the odds ratio of quitting.[8] Despite this knowledge, less than half of smokers state that their family physician advised them to quit or cut down on the number of cigarettes they were smoking.[6] Primary care guidelines for smoking cessation recommend that clinicians discuss smoking cessation at each visit. However, there are a number of barriers that prevent doctors from providing smoking cessation counselling. These include; lack of time, skills, perception of lack of effect, reluctance to raise the issue due to patient sensitivity about smoking, perceived lack of patient motivation, and not using effective strategies or using ineffective strategies.[9] Identifying patients as smokers and missing opportunities to discuss smoking cessation (at all visits) adds to the barriers.[9] Smokers typically do not actively seek assistance for smoking cessation from their family physicians unless they are ready to quit and subsequently, family physicians often do not breach the subject unless they feel the patient is ready.

Though the rate of tobacco use has dropped significantly since the 1960s, a substantial number of Canadians continue to smoke. It is apparent that this highly addictive behaviour is both dangerous to our patient's health and a burden to our healthcare system. It is therefore imperative that clinicians take a more aggressive approach to helping our patients quit. We believe that the first step in doing so, is reaching out to these patients and encouraging them to quit smoking at every visit and to make follow up appointments to reinstate encouragement and support.

1. Tobacco use of Canadians, 2012 and 2013. Statistics Canada. May 9, 2017
   http://www.statcan.gc.ca/pub/82-625-x/2015001/article/14210-eng.htm
2. Rehm J, Baliunas D, Brochu S, Fischer B, Gnam W, Patra J, et al. The costs of substance abuse in Canada 2002. Ottawa: Canadian Centre on Substance Abuse; 2006
3. Krueger H, et al. Variation across Canada in the economic burden attributable to excess weight, tobacco smoking and physical inactivity. Can J Public Health 2015;106(4):e171–e177
4. Ghadirian P. *Sleeping with a Killer: The effect of smoking on human health*. Ottawa: Health Canada; 2004.
5. U.S. Department of Health and Human Services. *The Health Benefits of Smoking Cessation: A report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services; 1990.
6. Leatherdale S. Smoking cessation: intentions, attempts and techniques. Health Reports (82-003-X) Vol 20. No4. Statistics Canada. http://www.statcan.gc.ca/pub/82-003-x/2009003/article/10904-eng.htm
7. Lancaster T, Stead L, Silagy C, Sowden A. Effectiveness of interventions to help people stop smoking: findings from the Cochrane Library. British Medical Journal 2000; 321(7257): 355 8.
8. Papadakis S. Delivering evidence-based smoking cessation treatment in primary care practice. Can Fam Physician 2014;60:e362-71.
9. Zwar NA,Richmond RL. Role of the general practitioner in smoking cessation. Drug Alcohol Rev 2006;25(1):21-6

1.4 - For a QI project related to the above problem, who should be on your project team? [a flow chart can help identify]

There will be two resident physicians working together on this project. Assistance will be required from the primary preceptor allocated to each resident. These preceptors will assist with project design, method overview, data collection and approval of smoking cessation counselling approaches. Their supervision during patient appointments and management of pharmaceutical interventions for cessation will be key in ensuring all smoking cessation appointments are effective. Administrative assistance from office secretaries will also be necessary to accurately complete EMR searches, hand out tobacco use surveys to smokers and appropriately book smoking cessation appointments as needed. The residents will be personally implementing strategies to encourage active participation of patients in smoking cessation discussions. These strategies include poster advertisements and tobacco use surveys for patients willing to formally discuss their tobacco use and even direct contact with known smokers to offer space to discuss their addiction. Appropriately, the residents will then spearhead each smoking cessation appointment and any follow up required thereafter. Allocated preceptors may be required to assist with this task.

--2 -- FRAMEWORK ---

2.1 - Aim Statement – What improvement do you want to see? [Should answer: How good? For whom? By when?]

The aim of this project is to increase the number of current adult smokers in two family physician practices receiving smoking cessation counselling. We aim to increase the current number (11%) by 5% within four months of implementing the first PDSA cycle.

2.2 - Family of Measures – What will you measure? How will you measure it?

1. Outcome Measure *[measure you ultimately want to impact]*	The number of initial smoking cessation counselling appointments.
2. Process Measure *[measure that will tell if on way to improvement]*	The number of patients who are smokers with documented mention of smoking habits. The number of patients who are prescribed quit aids.
3. Balance Measure *[measure suggests changes affect other areas]*	Primary preceptor satisfaction; based on time required to encourage patient involvement and to counsel them as well as their likelihood to

	remember to initiate smoking cessation discussions with smokers. The number of patients that are identified as smokers.

2.3 - Complete a cause and effect diagram to understand the root cause of problem. Can attach as separate document.

See attachment

2.4 - List change ideas that might result in improvement [Use QI tools: process map, benchmarking, change concepts, etc]

(1) Placing a poster in the office space encouraging patients to discuss their smoking behaviour
(2) Asking every patient at each appointment about their smoking behaviour and willingness to quit (I.e. seeking opportunities for initial smoking cessation counselling)
(3) Calling documented smokers and asking if they are willing to participate in a new smoking cessation initiative.
(4) Providing an incentive to patients who book a smoking cessation appointment (EX:entry into draw for a raffle prize for those who follow through with appointment)

2.5 - Choose 1 change idea and describe how it was prioritized. (Think feasibility, stakeholder buy-in, high yield/low effort)

Our first PDSA cycle involves posting information in the family medicine office for smoking cessation counseling. This idea was proposed as the first PDSA cycle as it is easy, cheap and not time consuming. Furthermore, we want to assess if this will influence patient's willingness to actively broach this topic

2.6 - Are there any ethical concerns with this project (data privacy)? [Use screening tool ARECCI for ethics eligibility]

Confidentiality: as part of this quality improvement project, we may be personally contacting patients who are smokers to schedule smoking cessation appointments. Contact will be made via telephone and will only be completed while at the family medicine office. Patient information will not be removed from the office and the data that we will collect will not include patients personal information or that that they may easily identify a particular patient. Patients will only be contacted by the methods in which they have provided consent for based on their EMR profile. We will be collecting and discussing information related to smoking, which is a behaviour that often negatively affects health, life and disability insurance premiums and coverage. This information will be recorded in EMR charts only, which are only accessed in office, and as such we do not believe that there is any increased chance in breach of patient confidentiality compared to baseline. Furthermore, all relevant data collected as outcome and process measures are quantitative measures which will be conducted via EMR system searches, and as such final statistics will not contain any patient identifiers.

Stigmatizing Conditions or Reputation: smoking cigarettes may be associated with stigma, and as such a breach of confidentiality may compromise patients' reputations. This may vary depending on many factors including but not limited to patients' jobs, charity involvement, political positions, religious affiliations and social circles. For example, the stigma associated with smoking may negatively affect the reputation of a personal fitness trainer, a community physician or even a patient whose parents died from lung cancer.

Anxiety Provocation: the topic of smoking cessation can be an emotional topic for some patients. As primary care physicians it is our duty to focus on preventative care and lifestyle improvements, including smoking cessation. As such, smokers inherently understand that at each appointment there may be a chance that their doctor addresses their smoking status. However, one may argue that this can cause anxiety provocation beyond what a reasonable person may expect in day-to-day interactions with their physician, especially if the patient perceives their presenting complaint is unrelated to their smoking status. Nevertheless, the benefits outweigh the risk of discussing what is potentially a sensitive topic for patients. This is supported by studies which show there are greater rates of smoking cessation when physicians initiate cessation counselling with their patients on a regular basis.

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Conflict of Interest: for smoking cessation appointments, we will be using an evidence-based approach for assessment, recommendations and interventions. Neither resident nor their respective preceptors have any conflicts of interest with this research project, including but not limited to the following: self-identified personal bias or conscious discrimination against smokers, moral limitations or religious motives, or monetary and financial gain.

2.7 - Is project realistic (setting/resources)? Can it be done in 3-6 months? Have you consulted with team/stakeholders?

This resident project has been discussed with the above mentioned preceptors as well as the resident project coordinator whom have all agreed that this project is a realistic endeavour. We have also drafted timelines for this project and we believe that it can be completed within 4-5 months. The project includes the practices of two full-time family physicians in the city of Windsor, who each see approximately 30 patients per day with a combined total roster of over 4500 patients, approximately 400 of whom are identified as smokers. We believe that the patient volume of the combined two practices will be sufficient for generating useful data. The length of each PDSA cycle will likely be adjusted as the project proceeds and will be based on data collection.

---3 -- PLAN DO STUDY ACT---

- ▪ **Identify one change you would like to test.**
- ▪ **PDSA 1 should be a very small test. Subsequent PDSAs can be larger if PDSA 1 is successful.**
- ▪ **If PDSA 1 does not work, think 'why' and determine another change to test.**
- ▪ **For this project, you should aim to complete at least 2 PDSAs.**
- ▪ **Copy and paste this worksheet as needed [e.g. additional PDSAs or testing 2 changes in parallel]**

What, when, where will you test? Who will test it? What data will you collect and how?	What did you find? What did you find unrelated to the plan?	Analyze your data you set out to collect in "Plan" Did test lead to improvement?	What modifications should you make? What will you do for the next PDSA?
PDSA 1 Date started: July 26, 2017 Date completed: N/A			
Plan	**Do**	**Study**	**Act**
Post information in two family medicine offices about smoking cessation counselling, and encouraging current smokers to broach this topic at each of their appointments. To determine effectiveness of this strategy, data for the family of measures outlined above will be collected at least twice during the cycle. Data will be collected using the pre-set, standardized	We found that the poster did initiate some discussion on smoking cessation. However this plan did not involve the physician in initiating the discussion and therefore relied on the patient to breach the subject.	We originally set out to collect the number of appointments made for smoking cessation counselling. However, it became apparent that patients typically do not make these appointments and our project confirmed this. There were zero appointments made. We therefore collected data on the number of times smoking cessation counselling was billed (ie. searching for billing code E079).	Involve the physician in initiation of smoking cessation discussions. The next PDSA will help prompt the physician to initiate smoking cessation counselling.

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| searches specifically generated for this project in Practice Solutions EMR system. | | Baseline data shows a mean frequency of an E079 billing every 3.6 clinic days on which at least 1 smoker was seen for any reason (there were 23 E079's billed over a period of 82 consecutive clinic days). During PDSA #1, there were 5 E079's billed over a period of 14 consecutive clinic days. As indicated by our Shewhart chart, there was not an indication of a change in mean billing frequency during this period (see results for more details).

Staff and lead physician were happy with this measure, as it caused no additional work or effort for the team. Additionally, it seemed to generate spontaneous discussion from patients (I.e. they inquired about the poster itself, and why it was displayed).

The number of smokers identified prior to this PDSA cycle was 153. This number was unaffected. | |

PDSA 2 Date started: August 23, 2017 Date completed: October 16, 2017			
Plan	**Do**	**Study**	**Act**
Identify smokers at beginning of appointment to see their family physician for any reason. Those patients who identify as smokers will be asked to complete a tobacco use survey, provided they give consent. To determine effectiveness of this strategy, data for	The tobacco use survey was well received by patients. It was easy to complete and was not time consuming for the patient. This approach involved the physician as well as the patient in initiating smoking cessation discussions. The patient handed the completed survey to the physician at the beginning of the	Again data was collected on the number of times smoking cessation counselling was billed by searching for billing code E079. Using Shewhart charts, it can be seen that although there is a trend towards more frequent E079 billings during the PDSA cycles (trial mean for PDSA #2 was 2 clinic days	The results are promising. Due to time constraints, a third PDSA cycle will not be completed. The use of tobacco surveys appeared to turn an otherwise unstable system into a predictable process. This is reflected in our data. A physician may consider

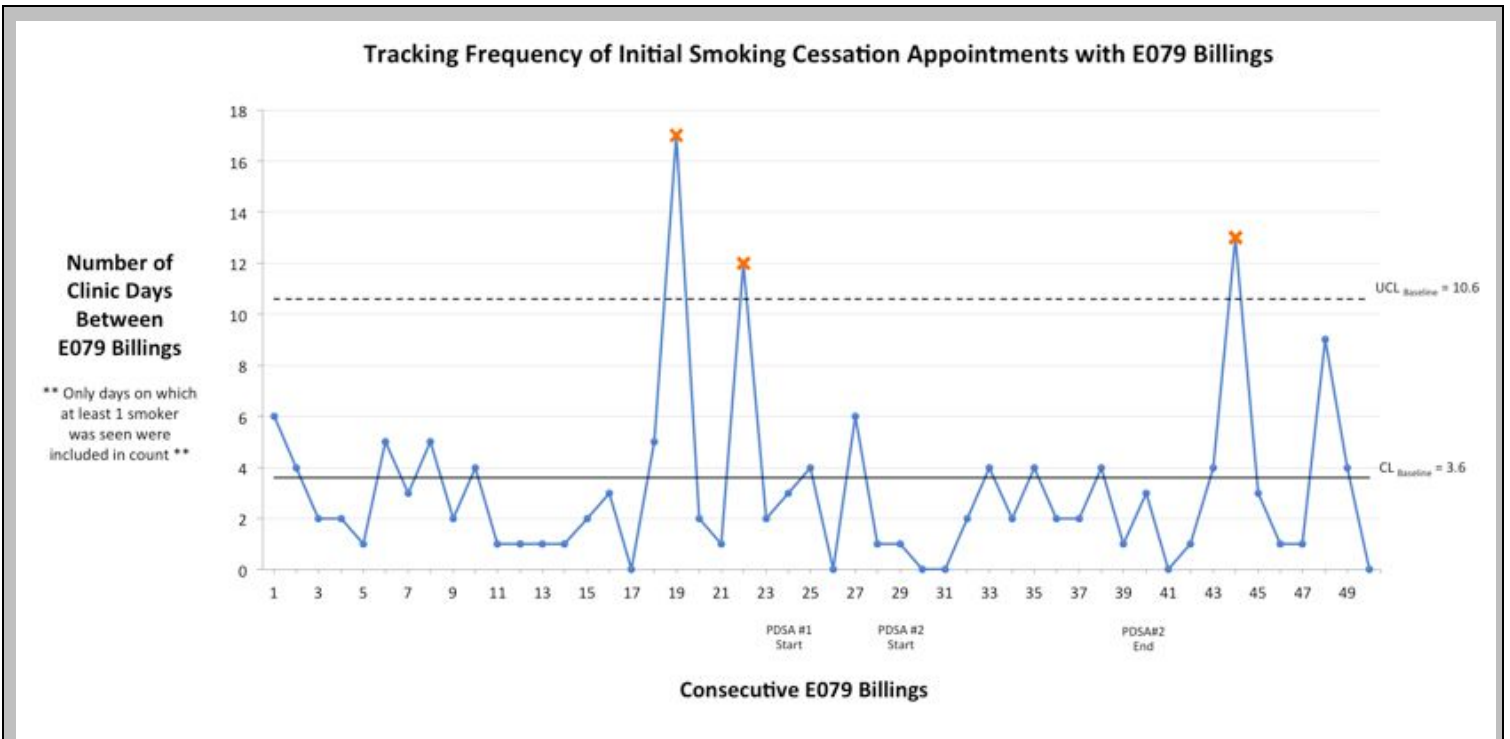|			
the family of measures outlined above will be collected at least twice during the cycle. Data will be collected using the pre-set, standardized searches specifically generated for this project in Practice Solutions EMR system.	appointment. The physician then reviewed the contents of the survey and addressed them with the patient during the same appointment.	between billings), there is never an actual significant shift in the overall mean. There were 11 E079's billed over a period of 22 consecutive clinic days during this PDSA cycle. It also did not affect the number of appointments specifically made to discuss smoking cessation. It did, however, eliminate special cause variation and thus introduce stability into an otherwise unstable process (see results for more detail). Staff was enthusiastic and supportive of this change. They did admit that it was more time-consuming than the poster. The number of smokers identified prior to this PDSA cycle was 153. This number increased to 156. We speculate this increase was due to improved EMR documentation of smoking status secondary to the frequent, regular discussions generated by our team's efforts.	implementing this tobacco use survey into their practice at regular intervals throughout the year to ensure opportunities for discussion of smoking habits. If a third PDSA cycle were created, one could consider booking an additional 10 minutes for each smoker at their appointment to allow sufficient time for initial cessation counselling. This is relevant, as there were missed E079 billing opportunities simply due to time constraints within unplanned appointments (as per physician and staff feedback).

--4 -- SUMMARY REPORT--

**4.1 - Give brief summary of results for each family of measure below.**

Outcome Measure	Our initial outcome measure was the number of appointments made specifically to discuss smoking cessation. Zero appointments were made for this purpose prior to the QI project and during both PDSA cycles. Alternatively, we aimed to measure the frequency of initial smoking cessation counselling discussions, as indicated by our surrogate marker (billed E079 codes).

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	Baseline data shows a mean frequency of an E079 billing every 3.6 clinic days on which at least 1 smoker was seen for any reason. Using Shewhart charts, it can be seen that although there is a trend towards more frequent E079 billings during the PDSA cycles (trial mean for PDSA #2 was 2 clinic days between billings), there is never an actual significant shift in the overall mean. Interestingly, our baseline data demonstrated special cause variation, indicating an unstable process. By calculating a trial mean and upper control limit for PDSA #2, it appears that the distribution of the tobacco use survey (PDSA #2) eliminates this special cause variation, ultimately introducing stability into an otherwise unpredictable process. Furthermore, when PDSA #2 is stopped (that is, when the survey is no longer being distributed), the process quickly drifts towards instability. This reinforces the evidence that the tobacco use survey is effective at producing a more sustainable, regular outcome.
Process Measure	Limitations of the EMR software made data collection for process measures challenging. In order to appropriately calculate the number of patients who are smokers with documented mention of smoking habits, we would have to know the number of smokers that visited for any reason during the each time frame. Unfortunately, the EMR system did not allow us to search for this data easily. Therefore we were not able to display our process measure data appropriately. This being said, the following "rough" process measures were observed which compared number of smoking habit documentations with number of days: 1. Baseline data shows that there were 170 smokers in the year prior to our QI project (June 2016-June 2017, 47 weeks) with documented mention of smoking/tobacco use during that time. An average of 3.6 documentations per week. During PDSA #1 (which lasted 2.5 weeks), 22 smokers had documented mention of smoking/tobacco use, for an average of 8.8 documentations per week. During PDSA #2 (which lasted 6 weeks), 31 smokers had documented mention of smoking/tobacco use, for an average of 5.2 mentions per week. There did not appear to be any correlation between the number of times it was mentioned in each PDSA and the primary outcome measure. 2. Baseline data shows that 17 quit aids were prescribed in the year prior to our QI project (June 2016-June 2017, 47 weeks) for an average of 0.36 per week. During PDSA #1 (which lasted 2.5 weeks), 1 quit aid was prescribed, for an average of 0.4 prescribed per week. During PDSA #2 (which lasted 6 weeks), 2 quit aids were prescribed, for an average of 0.4 quit aids prescribed per week. There did not appear to be any correlation between the mean number of quit aids

	prescribed and the primary outcome measure.
Balance Measure	1. Primary preceptor satisfaction; based on time required to encourage patient involvement and to counsel them as well as their likelihood to remember to initiate smoking cessation discussions with smokers.
	PDSA 1: Smoking Cessation Poster
	Staff and physician found the poster to be easy to use, a good intervention to implement in the office on a regular basis. It did not interrupt with their normal duties, however it was somewhat time consuming. The poster did not create negative interactions with other staff members or patients. Staff and physician understood and were comfortable with their role related to the poster. Comments regarding the poster: "Posters were well designed and went straight to the point. They encouraged patient to initiate conversation regarding smoking cessation. Patients were often complimentary regarding the posters." "I am glad to be part of this project to help out."
	PDSA 2: Tobacco Use Survey
	Staff and physician found the survey somewhat easy to use, and agreed somewhat/completely that the survey was a good intervention to implement in the office on a regular basis. They somewhat agreed that it did not interrupt with their normal duties, and some felt that the intervention was somewhat time consuming. The poster did not create negative interactions with other staff members or patients. Staff and physician understood and were comfortable with their role related to the survey. THe survey was administered most of the time to appropriate patients. Comments regarding the survey: "The survey initiated good dialogue with patient regarding smoking cessation. It did require intervention by staff. Although this took only a small amount of time from staff it did distract from their usual duties. It also added somewhat to the usual time taken by myself with the patient, but the positive impact of the survey on patients smoking habits outweigh the small negative impact of the added time factor. Overall the survey was well received by patient and was helpful it getting the conversation started regarding smoking cessation."
	2. The number of patients that are identified as smokers: baseline 153, PDSA 1 N/A, PDSA 2 156. The poster and tobacco use surveys helped to identify smokers.
4.2 - Present your results for the outcome measure with the below graph [or create your own chart within word or excel] *[Right click on chart area and select "Edit Data". Change data to reflect your numbers]*	

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Figure 1. Shows no significant improvement in the mean frequency of E079 billings during PDSA cycles #1 and #2 compared to baseline
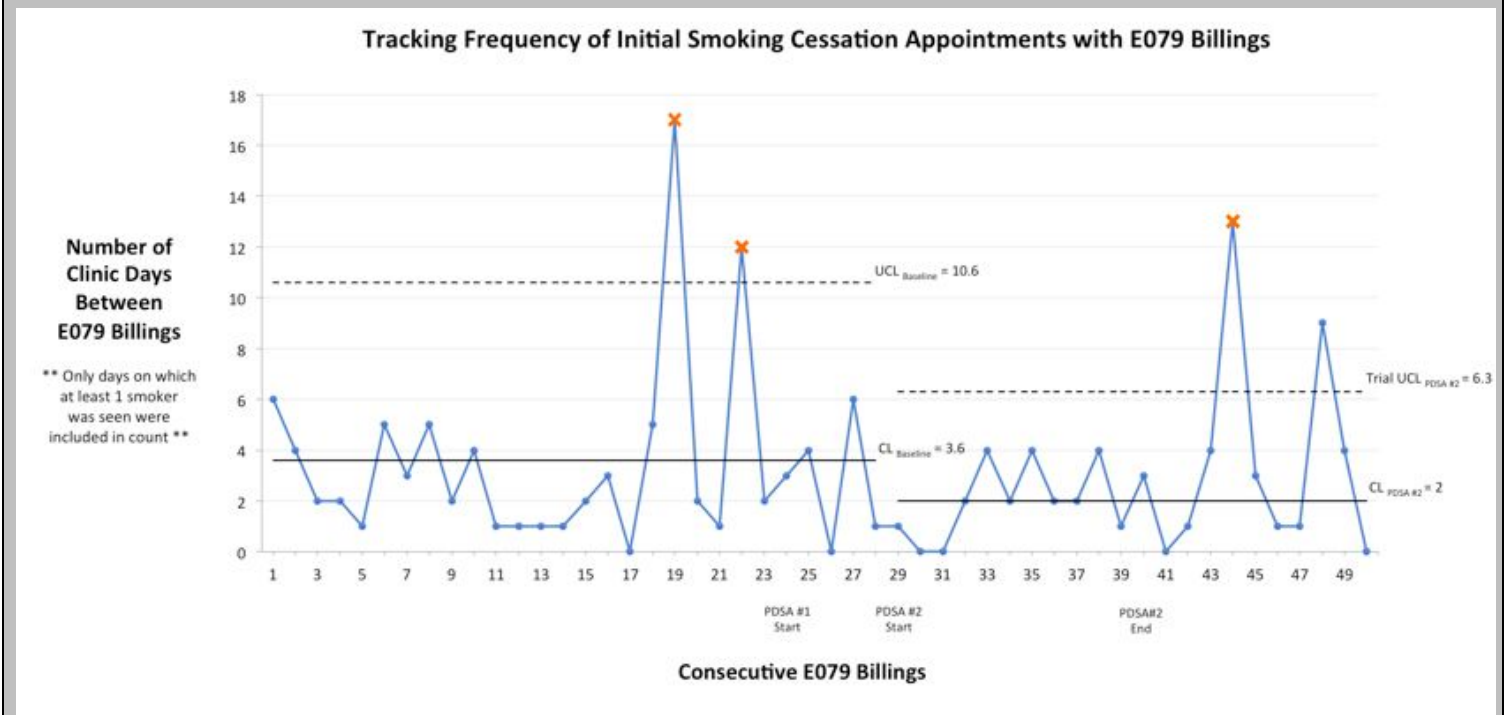
Figure 2. Shows a change towards stability of E079 billing frequency during PDSA cycle #2 (as the data displays only common cause variation during this cycle). Once PDSA #2 ends, the data immediately drifts towards instability (much like the baseline data, as indicated by the data points outside the upper control limit [UCL])

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4.3 - Based on findings, should project be continued or implemented? Why (not)? Reflect on sustainability of project.

Overall:
Both cycles were relatively easy to implement and were cost effective. They both stimulated smoking cessation discussion which typically interfered with time management as appointments were significantly longer to accommodate an extra concern. There were no complaints that were voiced by patients. That is, patients were not offended by the poster or questions in the tobacco survey. Participation was voluntary.

PDSA #1 - Poster:
Implementation of the poster is easy, cheap and does not interfere with duties of the staff. It relies on the patient to initiate discussion. Although we do not have the amount of data necessary to show that this approach is effective, intuitively we believe that this approach may be helpful for smokers who are ready to quit. In contrast, it likely does not stimulate discussion between the physician and smokers who are not currently interested in quitting. The permanent placement of a poster encouraging smoking cessation is very reasonable.

PDSA #2 - Tobacco Survey:
Based on our Shewhart charts, the tobacco survey did not significantly affect the overall frequency of E079 billings (Figure 1). However, Figure 2 demonstrates that implementation of this survey may have a positive impact on the process as a whole. Prior to PDSA #2, there is special cause variation (as points #19 and #22 fall well outside the upper control limit (UCL)), indicating instability. If a new mean and trial UCL and lower control limit (LCL) are calculated for the duration of PDSA #2, one can see common cause variation only. As special causes are identified and removed, a process becomes stable. The benefits of a stable system include (**Provost et al)**:
1. Performance is predictable
2. Costs and quality are predictable
3. Productivity is at a maximum and costs are at a minimum in the stable system
4. The effect of change can be measured with greater reliability and speed
5. A stable process provides a sound argument for altering specifications that cannot be met economically

It is important to note that PDSA #1 (the poster) was never discontinued at any point. This is interesting because once PDSA# 2 stops (I.e. when the survey is no longer administered), there is almost an immediate drift towards special cause variation. Keeping in mind that the poster remained public during the entirety of the QI project, this reinforces that the increase in stability introduced to the system may be exclusively attributed to the tobacco survey.

Understanding these results in light of the balance measures is important. It appears that this survey is effective in initiating regular, predictable conversations surrounding smoking cessation. However, the staff admits that this intervention is somewhat time consuming, and only agree somewhat that it could be used on a regular basis. As such, we believe that a planned, intermittent implementation of this tobacco survey would be appropriate in the primary care office setting. For example, one office may choose to administer these surveys on an annual quarterly basis for a month at a time. By doing so, a primary care physician could ensure that they are giving themselves regular opportunities to discuss smoking cessation with their patients throughout the year. Furthermore, the stability of the system would allow the physician to readily collect data regarding the time and resources required to implement these cycles. This may manifest as regular intervals of allotted time set aside for smoking cessation counselling during each cycle, thus preventing a single appointment from derailing their overall schedule.

4.4 - If results did not reach goal, what are possible explanations for the variance from the target?

Our initial goal was based on increasing the number of appointments made exclusively to discuss smoking cessation.

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However, it quickly became clear that patients do not typically make appointments to discuss their smoking habits. As such, we desired to increase the frequency at which E079s (initial smoking cessation counselling sessions) are being billed. According to our Shewhart charts, we did not effectively increase the overall frequency of E079s. However, as per the discussion in Section 4.3 of this project, our intervention in PDSA #2 did introduce stability into the system.

Many reasons may explain the inability to increase the overall frequency of E079s. First and foremost, this was conducted in an academic primary care setting with practicing family medicine residents and clerks. As learners we are constantly encouraged to explore lifestyle habits, and initiate these difficult discussions. As such, this office was performing smoking cessation moderately well (but not regularly) prior to our intervention. Second, and importantly, an E079 can only be billed once per patient per 12 month cycle. That is, as each year progresses it becomes increasingly difficult to bill an E079 for smokers who visit the office regularly. With each successive day the chances of increasing the frequency of billed E079s fluctuated (and likely decreased). Another limitation was the length of our PDSA cycles. These were shortened interventions, limited by our time in the family office. It would be interesting to see how the overall frequency would be affected if this QI project were extended for several months. Additionally, an important consideration is the overall deviation from our initial plan. We initially planned on contacting smokers in their homes, which we believe would have increased the number of appointments made specifically for smoking cessation. After further discussion we did not believe that this was feasible for many reasons (time, confidentiality, cost of staff overtime), and thus did not implement this change.

Nevertheless, although we did not meet our initial goal, the results from PDSA #2 were interesting and helpful as they shed light on the stability of E079 billing patterns. This will ultimately allow consideration of future interventions (specifically intermittent tobacco survey administration) to improve the overall performance of the system.

4.5 - Describe possible sources of bias to your project.

- Physicians may be more likely to bill for smoking cessation appointments since starting the project.
- Providers may be more likely to initiate smoking cessation discussion to improve the outcome of the project.
- Presence of learners in this practice may have an impact on the amount of smoking counselling occuring compared to a practice that does not teach learners. Students are often prompted to explore patients' lifestyle habits and are encouraged to initiate these challenging discussions. It would be highly interesting to see what the data would reflect in a non-academic family medicine practice.
- Both PDSA cycles only targeted smokers who attended appointments. It did not involve rostered patients who did not come in for an appointment. This may bias towards patients who are more proactive in their health (and thus more likely to engage in smoking cessation discussions). This also biases towards patients who can financially afford to attend their appointments.

4.6 - Describe successes in implementing the change	Overall the office was quite successful in implementing both PDSA cycles.
	Displaying the poster from PDSA #1 was simple, low cost and did not interfere with staff's routine duties. As such, it is likely an intervention that would be successful in any practice.
	Conversely, the tobacco survey in PDSA #2 required more investment and cohesive efforts from the entire staff. Fortunately the office in which this was conducted is truly a team. As such, we were successful in implementing this change. This does require a FULL team effort. Most patients were open to completing the survey. This openness was fostered by the reception and

	administrative staff, who took time to explain that the office was introducing an initiative to assist smokers with cessation. As a whole the office was enthusiastic to introduce these changes, and interested in the interpretation of the final results (see Section 4.9 for more details).
4.7 - Describe difficulties in implementing the change	As patients were not making appointments for initial smoking cessation counselling, this was typically done on top of a visit made for various other reasons. Therefore, appointment times were longer which occasionally interrupted the flow of a standard office day.
	As such, it was impossible to initiate smoking cessation discussions at some appointments simply due to time restrictions.
	This was reflected by the balance measures, as the staff indicated that PDSA #2 was somewhat time consuming. This challenge can mean the difference between staying on time and falling off schedule. More specifically, it could mean the difference between enjoying a midday break or skipping lunch. To extrapolate, this also could mean the difference between disgruntled patients and colleagues versus happy participants in an improvement project.
	Nevertheless, as indicated by one participant, the small investment of implementing this change is worth the overall outcome (improvement in system performance, and thus better smoking cessation efforts).

4.8 - Discuss significance and relate findings to the literature [min 5 references]

The results of this quality improvement project show that patients are unlikely to make appointments to discuss their smoking habits and that these discussions are usually prompted either by a smoking cessation poster offering assistance, tobacco use surveys or physician inquiry. These results are congruent with the literature. McPhillips-Tangum et al stated that lack of patient demand was a significant barrier in providing smoking cessation services.[2] Additionally, Cokkinides et al reported that of all patients who attempted to quit smoking in 2000, only 22% sought assistance.[3] This is in keeping with Thorndike et al who showed that only 27% of smokers asked their clinician for help with quitting.[4] Many smokers who do not have other active health concerns are unlikely to visit their primary care physician. Therefore they are less likely to receive any sort of intervention for smoking cessation. A future quality improvement project could look at the benefit vs cost of contacting these patients and encouraging them to make an appointment to discuss smoking cessation.

Based on the literature it has been shown that even brief discussions with patients about their smoking habits and encouraging them to quit increases smoking cessation rates.[5] This has been shown to be dose dependent, in that the more discussions you have with your patient about quitting smoking, the more likely they will succeed at doing so. Although the tobacco use survey did not show significance for increased E079 billing frequency, it did show a *trend* toward increased frequency. The data certainly showed improved stability (and thus predictable performance) of smoking cessation counselling. Unfortunately the number of times patients were asked about their smoking status or habits was not accurately measured due to EMR search capabilities. It would, however, be interesting to see if these interventions significantly improved informal smoking cessation encouragement. The time frame of this project was not long enough to determine smoking cessation rates. However, since this project helped to initiate counselling or even just mention smoking

habits, we would expect to see the rate of smoking cessation rise over time.

Our balance measure identified that both the poster and the tobacco use survey somewhat interrupted regular staff duties and was time consuming. This is in keeping with the literature. One of the major barriers to providing counselling in general is that practitioners find the process time consuming.[6] However, overall team members felt that the positive outcomes outweigh these setbacks. In the future, physicians and staff members could accommodate for this by scheduling a few extra minutes for patients who are smokers.

Often times in medicine there is inconsistency between what is discussed between physician and patient and what is documented in the medical record. It is possible that the use of tobacco use surveys improved documentation of smoking habits, counselling and perhaps even improved billing of smoking cessation counselling. A study completed by Coleman et al concluded that distribution of questionnaires about smoking to patients before and after doctors appointments significantly increases practitioner documentation of discussions about smoking in medical records.[7]

Another aspect of smoking cessation that this quality improvement project did not address is patient satisfaction as well as their perspective with respect to how they would like the discussion to be initiated and what they found most or least useful. We did not seek patient input prior to the design of this study. In the future it may be beneficial to conduct a survey to determine patient preference. No studies in the literature were found addressing patient preferences for approaches to smoking cessation. However those that do receive counselling are relatively satisfied and find the intervention acceptable.[8,9]

A key part of smoking cessation is appropriate follow up. Research shows that physicians lack in providing follow up care.[4] This was not the primary focus of our project, however, the results of this study confirmed the above finding. Additionally, it is apparent that providing prompts with smoking posters and surveys do not increase the rate of patients making follow up appointments to reassess smoking status. However, if the project had been extended over a longer time period, we may have been able to see an improvement by providing follow up during an appointment made for another health concern.

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4.9 - Reflect on your team effectiveness. What worked well? What didn't?

Overall: Originally, the project was designed to involve the practice of two family medicine physicians. Unfortunately, due to

staff conflict (staff member working with another resident for their project) and physician vacation, it was not feasible to include a second practice. We therefore focused on the patient population of one practice that had open availability of staff members and clinic days. During both PDSA cycles, communication between team members was successful. Based on the performance surveys distributed at the end of each cycle, the staff felt positive about this experience and were happy to participate in the project. Their roles were clearly defined and easy to follow.

PDSA 1: This cycle required minimal work from staff members (ie. receptionist and nurse). It really only required the physician/resident/student to participate if the patient initiated discussion. At that point, there was minimal interaction between staff members. Once patients initiated the topic, it was immediately discussed (I.e. generally not postponed for another appointment).

PDSA 2: This cycle required significant involvement of our receptionist. Following the completion of the project, a survey was completed by the receptionist whom stated that they were agreeable to their role and felt that it did not interrupt her other duties significantly. However, it was apparent that occasionally the survey was not given to patients. This is more of a project design flaw rather than an individual staff issue. Additionally, once surveys were completed, it was up to the physician/resident/student to review the completed survey and initiate counselling. This was dependent on the individual, and their receptiveness/agreeableness to this role. However, due to time constraints during some appointments, the completed surveys were not discussed. This was an issue inherent to the project design, not of a specific team member.

4.10 - Describe lessons learned from an improvement project on this topic. What would you do differently?

As this was our first quality improvement project, most of what we learned was centered around the design and implementation aspects of the project. This included identifying a common problem or patient safety concern and developing interventions to reach a satisfactory outcome.

Choosing a QI initiative is not always easy. Inefficiencies and difficulties of daily medical practice are specific to an individual family practice (I.e. a QI project may not be necessary or possible for one practice, while it may be remarkably transformative in another). We decided on the topic of smoking, as it affects many aspects of our patients health, it is still a major problem in society today and something that we felt still needs a lot of attention. Behaviour modification is one of the most challenging tasks for patients, and furthermore, for family physician's to effectively influence. For that reason we decided on improving smoking cessation counselling, rather than rates of complete smoking cessation behaviour. Smaller steps towards a larger goal is likely more successful and attainable. However, after initiating this project we realized that smoking cessation counselling was completed fairly well in the chosen office. As such, influencing any change in the mean frequency of counselling proved challenging. This once again reinforces two things: (1) a QI project should be specific to a setting and (2) sometimes a QI project may show that the initial practice is not operating as poorly as predicted.

Additionally, while implementing these interventions it was important to choose a strategy that was efficient, economical and did not interfere with clinical duties, or pose ethical concerns regarding patients. The success of a quality improvement project relies heavily on the dynamics of the quality improvement team. Many health care settings rely upon an entire team, rather than just a solo practitioner. As with all team settings, the success of any operation relies heavily on appropriate leadership, communication, collaboration, scholarship and expertise.

QI projects are one of the most efficient/effective approaches to implementing change in health care. QI projects require you to consider the costs and benefits of each implemented change and to objectively measure the desired outcomes as well as balance outcomes. When considering the approach of each of our PDSA cycles, we came up with several options for approaches for encouraging smoking cessation, however, we specifically chose changes that we felt were most likely to succeed in our office. The poster and survey were both easy to prepare, easy to use, sustainable, affordable, and voluntary for patients.

Importantly, we also learned that QI projects are dynamic processes. They change and deviate from initial plans based on the regular collection of data, process measures and balance measures. For example, in our project we chose to forego patient contact via telephone calls, emails and hard copy letters despite our original plans. We feel this was the right decision, and we were able to make it do to the flexible nature of the QI process. This is starkly different from research projects or randomized controlled trials in which adherence to the original methods and designs are critical to success and accurate data interpretation. Leaders in QI projects are often actively invested in the outcome, and the dynamic nature of these processes allow QI teams to have more control over the performance and direction of their initiative.

Lastly, we learned that QI projects are actually quite accessible to the layman. Admittedly this QI project required significant personal investment, however it was doable. Collection of data was difficult, and the interpretation of the data was even more laborious. As we delved deeper into our project, we learned that run charts could not accurately display the data in an effective manner. As such we were forced to learn about another QI tool: the Shewhart chart. This tool gifted us with the ability to look at another aspect of our data: stability. By following this unexpected statistical path, we were able to identify and understand the depth of our data in a way that a simple run chart could not display. The acquisition of this new knowledge will certainly prove useful as future family physicians.

One particular challenge in this project was data collection. At times it seemed nearly impossible to use the EMR system for developing searches for each outcome. Additionally, this part of the project was the most time-consuming once the searches were established. Data could have been collected manually, however, this would have required an exorbitant amount of time to finish. As busy professionals, primary care physicians may feel overwhelmed with data collection if they do not have the proper technology to collect data efficiently. Unfortunately, this may impede involvement of staff members and practitioners in current and future QI initiatives. Therefore, it would be beneficial if EMR systems were updated or created to include straight-forward search and data collection options. This would ensure broader, easier and more enthusiastic approaches to QI in the outpatient setting.