Ultrasound Use in Screening for First Extensor Compartment Anatomical Variations in Patients with De Quervain's Tenosynovitis

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Introduction

De Quervain's tenosynovitis (DQS) is defined as tendon inflammation or irritation in the first extensor compartment of the thumb. Previous works state that onset of DQS is more likely to occur if there is a septum present between the two tendons in the area. Given the high prevalence of anatomical variation and the seemingly variable response of DQS to corticosteroid injection (vs. orthoses alone or a combination of the two), our group is led to believe that this septation might play a larger role than initially anticipated.

We hypothesize that the presence of septation in the first dorsal extensor compartment will lead to decreased efficacy of a corticosteroid injection in the treatment for De Quervain's tenosynovitis.[1]

Aims and Objectives

- 1° objective: determine the efficacy of ultrasound imaging in screening the first dorsal extensor compartment for anatomical variations in patients with DQS
  - To screen for certain anatomical variations that render the relief provided by corticosteroid injection suboptimal if not guided by ultrasound
- 2° objective: to create a pilot program for ultrasound education in hopes of introducing the use of such techniques in orthopedic surgery clinics

Approach/Process

Phase 1: Ultrasound Training

- Medical students will be trained by a musculoskeletal radiology attending and resident-fellow in utilizing ultrasound to capture images of the first dorsal extensor compartment in patients with DQS (Figure 1)
- Validation of successful training through pre- and post-training assessments on both ultrasound theory and clinical visualization of the first dorsal extensor compartment

Phase 2: Determining Efficacy of Corticosteroid Injection

- Patients with DQS will undergo ultrasound imaging prior to corticosteroid injection to screen for any anatomical variants
- In the case that patients elect to undergo surgical treatment after a resurgence of symptoms, the presence or absence of the anatomical variation will be verified
  - This will be correlated back to our ultrasound findings to determine the efficacy of imaging in predicting sub-compartmentalization, and thus, failure of a corticosteroid shot to treat DQS

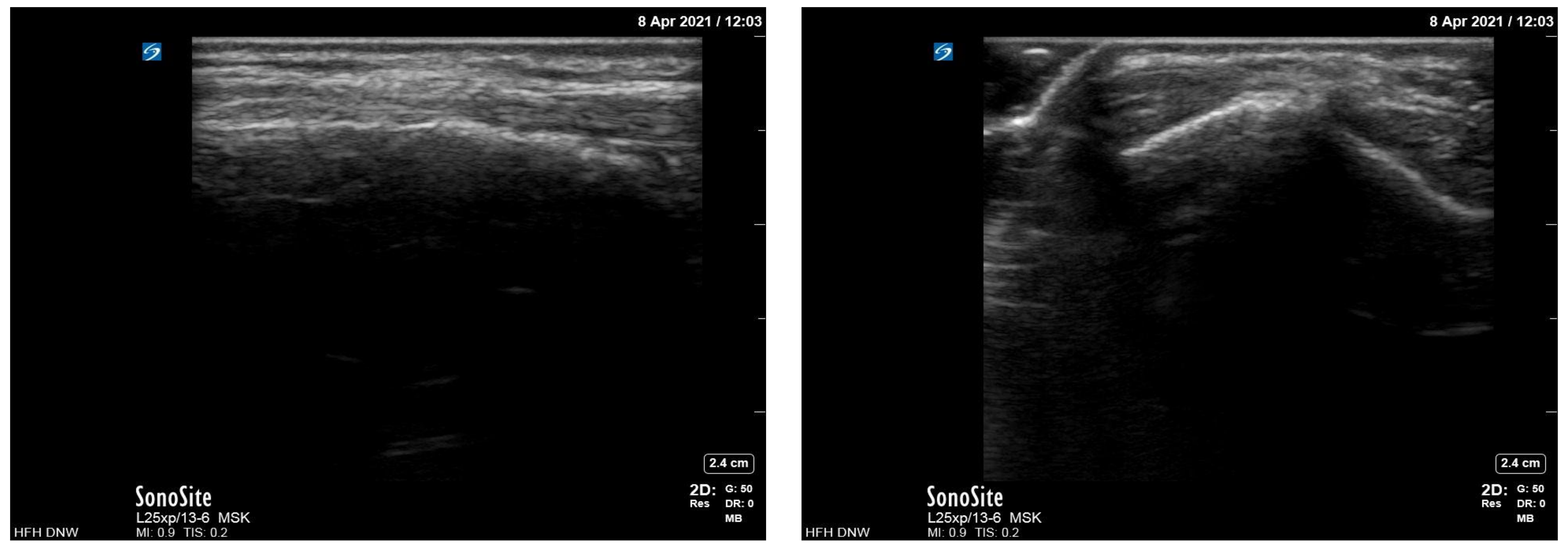

Figure 1. Long axis (left) and short axis (right) views of the first dorsal extensor compartment in a healthy volunteer imaged by a trained research assistant.

Evaluation Plan

Phase 1: Ultrasound Training

- Multiple training sessions with licensed professionals
- ACGME guidelines for ultrasound training that would be considered sufficient with associated testing will be followed

Phase 2: Determining Efficacy of Corticosteroid Injection

- Evaluation of the efficacy of ultrasound screening will be assessed by whether surgical exploration of the patient's wrist reveals findings consistent with the ultrasound imaging of that area in patients with DQS
- In the event surgery is not deemed to be necessary, efficacy of pain alleviation through corticosteroid injections will be assessed with Patient-Reported Outcomes Measurement Information System (PROMIS) scores

Current Results

Ultrasound Training

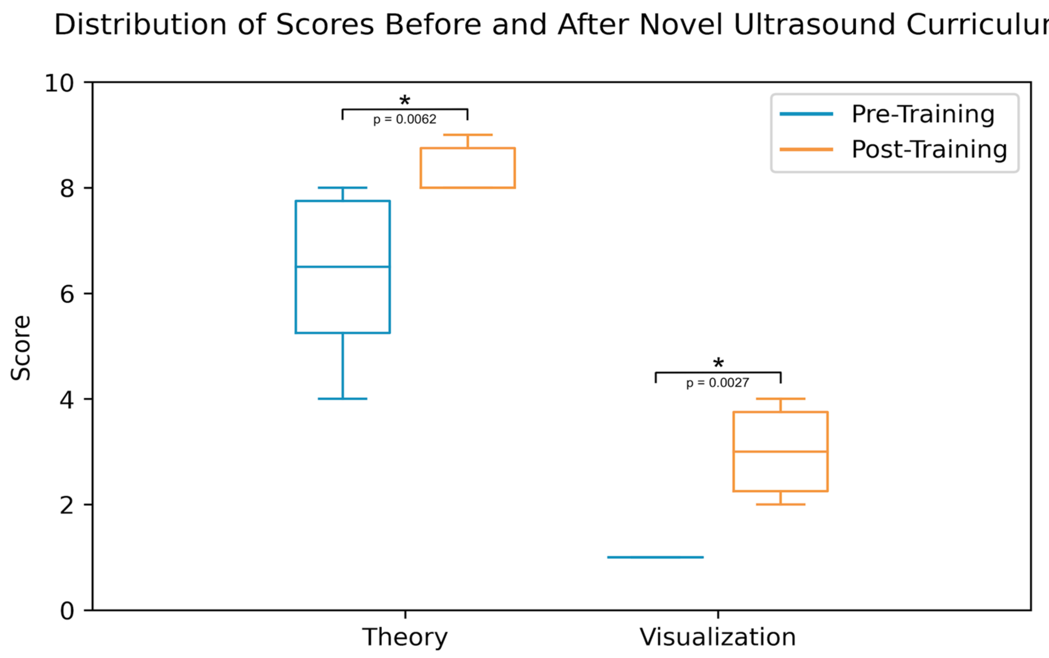

Figure 2. Boxplot representations of score distributions before and after ultrasound training (N = 6). *α = 0.05.

Three point and three-fold increases are displayed in pre- and post-training assessments of ultrasound theory and clinical imaging proficiency, respectively. Further training is expected to show similar results.

Expected Results

Determining Efficacy of Corticosteroid Injection

- Further ultrasound imaging will determine whether visualization of a septum is consistent with surgical findings obtained in the event that a patient does not receive desired pain relief from corticosteroid injection
- PROMIS Upper Extremity (UE) and Pain Interference (PI) metrics, commonly used to assess outcome in hand and upper extremity studies,[2] will determine the efficacy of corticosteroid injection
- Injection is expected to show diminished PROMIS results in individuals where a septation in the first extensor compartment is present[1]

Discussion

In order to assess a demographic in which most individuals had equivalent experience in ultrasound technique, participation in the educational study was limited to first-year medical students from Wayne State University School of Medicine (WSUSoM). Students were asked to self-report their previous ultrasound experience, and 92.2% reported their experience coming solely from the WSUSoM longitudinal ultrasound curriculum.

References

1) Ilyas, A. M., Ast, M., Schaffer, A. A., & Thoder, J. (2007). De Quervain Tenosynovitis of the wrist. *Journal of the American Academy of Orthopaedic Surgeons, 15*(12), 757-764. doi:10.5435/00124635-200712000-00009
2) Franovic, S., Gulledge, C. M., Kuhlmann, N. A., Williford, T. H., Chen, C., & Makhni, E. C. (2019). Establishing "normal" patient-reported outcomes measurement information system physical function and pain interference scores. *JBJS Open Access, 4*(4). doi:10.2106/jbjs.oa.19.00019

The Effect of a Flipped Classroom Learning Model versus Traditional Lecture Model on Residents' Decision-Making on Lumbar Spine Imaging for Non-Traumatic Back Pain in the Emergency Department

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Introduction

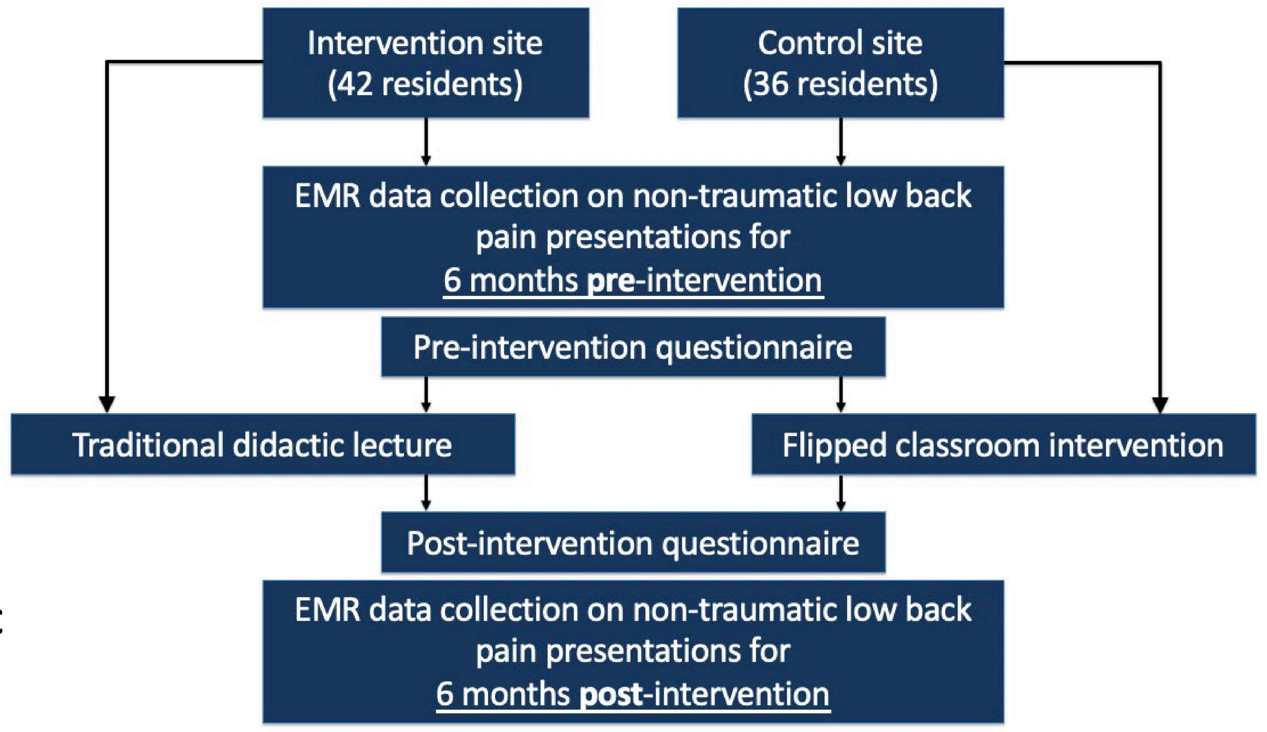
In Grand Round conferences, traditional didactic lectures have been an integral part of education in residency programs[1]. Due to passive learning, the effectiveness of the lecture format has been called into question from lack of learner engagement[2]. Previous studies have shown that a flipped classroom education improves resident satisfaction[3-4]. However, there is little data on whether this approach promotes a significant change in knowledge acquisition or in resident clinical behavior. The American College of Emergency Physicians "Choosing Wisely" Campaign suggests that lumbar imaging should be avoided for non-traumatic back pain in the absence of red-flag exam findings or risk factors[5]. This study hopes to evaluate the role of flipped classroom education in common conditions seen in the Emergency Department (ED).

Aims and Objectives

The primary aim is to determine whether implementation of a flipped classroom intervention results in significant changes in resident decision-making relating to lumbar spine imaging for non-traumatic back pain in the ED when compared to a traditional didactic lecture. The secondary aim is to determine whether the flipped classroom model improves knowledge acquisition for learners when compared to a traditional lecture.

Approach/Process

Resident physicians at the control site will receive a traditional didactic lecture while residents at the intervention site will receive the flipped classroom intervention. Both the intervention and control lecture will be facilitated by the same faculty member who is not affiliated with the study and is also unaware of the study goals. We will perform a retrospective review of the electronic medical record (EMR) for patients presenting to two academic urban EDs with a chief complaint of non-traumatic back pain over a 12 month study period (June 2019-June 2020) including the 6 months before and after the intervention. Only patients treated by a resident physician will be reviewed. Patient management outcomes (i.e. appropriateness of lumbar spine imaging) will be extracted from the EMR and compiled into an electronic database. Outcomes will be compared before and after the flipped classroom intervention to measure the potential impact of the intervention. Residents at both sites will also complete a brief test two weeks before and after the intervention on content knowledge to measure the degree of knowledge acquisition and retention. Both residents will be given a variety of resources such as Harwood and Nuss, Chapter 148: Low Back Pain and Rosen's Emergency Medicine, Chapter 43: Musculoskeletal Back pain, FOAMcast: Back pain and spinal epidural abscess, and EB Medicine's "An Evidence-Based Approach To The Evaluation And Treatment Of Low Back Pain In The Emergency Department." Test data will be deidentified and matched by a faculty member who is not involved in the delivery of the intervention prior to analysis.



Evaluation Plan

We have completed the educational intervention and control lecture including a total of 78 resident physicians (36-control, 42-intervention). Participants at both sites have completed the pre- and post-intervention questionnaires and these responses have been de-identified and paired. A total of 58 (70.7%) subjects completed both questionnaires. We are currently scoring the questionnaires and compiling the data for analysis. The EMR chart review has been begun, but is not yet completed. Once we have completed the data extraction and compilation, we will progress to the data analysis phase of the study.

Expected Results

Since we do not have any *a priori* assumptions about this population, we cannot speculate the data that will be obtained. This is a retrospective review, and therefore has no safety endpoints.

Discussion

The flipped classroom method has gained popularity since its introduction in 2012 and has led to a surge in research pursuit evaluating the model in medical education. A recent meta-analysis from *Chen, Lui, & Martinelli, 2017,* classified the effectiveness of flipped classroom by Kirkpatrick's method ranging from outcomes that change learner perception (level 1) to those that affect patient outcomes (level 4). They found that lower-level outcomes, such as whether a student "liked" flipped classroom methods, were more prevalent than in more rigorous studies. While learners report positive perceptions of the flipped classroom approach, strong evidence is lacking for the effectiveness of flipped classrooms in promoting knowledge acquisition above traditional learning methods[6]. Additional research is needed to provide a better understanding of the role of flipped classroom in medical education.

References

1. Cooper AZ, Richards JB. Lectures for Adult Learners: Breaking Old Habits in Graduate Medical Education. Am J Med. 2017;130(3):376-381.
2. Hurst JW. The overlecturing and underteaching of clinical medicine. Archives of internal medicine. 2004;164(15):1605-1608.
3. Khanova J, Roth MT, Rodgers JE, McLaughlin JE. Student experiences across multiple flipped courses in a single curriculum. Med Educ. 2015;49(10):1038-1048.
4. Moraros J, Islam A, Yu S, Banow R, Schindelka B. Flipping for success: evaluating the effectiveness of a novel teaching approach in a graduate level setting. BMC Med Educ. 2015;15:27.
5. Physicians ACoE. Choosing Wisely. 2014; http://www.choosingwisely.org/societies/american-college-of-emergency-physicians/
6. Chen F, Lui AM, Martinelli SM. A systematic review of the effectiveness of flipped classrooms in medical education. Med Educ. 2017;51(6):585-597.

Curriculum Integration of a Community Service-Learning Program at Oakland University William Beaumont School of Medicine (OUWB)

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Introduction

Service-Learning: Service-learning is an educational approach that values linkage of thought and action. One definition of service-learning is "a structured learning experience that combines community service with preparation and reflection" (Seifer, 1998). Service-learning has roots in Deweyan philosophy; emphasizing experience and community action as essential to development of lifelong interests in community engagement (Giles and Eyler, 1994).

OUWB Curriculum: Unlike voluntary community service experiences, service-learning programs in US medical schools aim to link community-based experience to intended curriculum outcomes. In January 2018, the *ad hoc* OUWB Curriculum Evaluation Subcommittee prepared a report (CES, 2018) recommending that M1 and M2 courses "investigate the feasibility of restructuring" course components to "be formal service-learning activities." This poster outlines the introduction of a service-learning program into the Promotion and Maintenance of Health 3 (PMH3) course at OUWB.

Rationale: Applicants to OUWB are selected, in part, for a demonstrated commitment to community service. Community engagement is also a central tenet of OUWB's mission. The PMH3 service-learning program provides meaningful support of the educational objectives of community and lifelong learning while enhancing relationships with OUWB community partners.

Aims

The aim of this research is to evaluate the alignment of course educational themes with service-learning engagements. The congruence of classroom teaching with service activities will be evaluated for each of five thematic educational aims of the PMH 3 course.

Approach

Course Development: Lecture topics were identified in existing course content and aligned to student service activities with Community Partner Organizations, as shown in Table 1. Community partners were made aware of didactic lecture content to assist them to create meaningful on-site encounters. At the start of each semester student teams self-selected one of five PMH course themes for their service commitment. Course themes were supported by didactic presentations by faculty experts, and by presentations at community partner sites by staff leadership. Program development included consideration of benefits to community partners by hosting of student service within their organizations.

Table 1: Community partners and the PMH 3 course curriculum

Course Theme	Community Partner Experiences	PMH3 Lecture-based Content	2019-20 students (n)*
1. Disability Care	OU Cares Macomb-Oakland Regional Center (MORC)	Working with Disabled Patients (Papadimitriou, Parten, Kretschmer)	95
2. Food Insecurity	Gleaners Food Pantries, Neighborhood House, Lighthouse, Meals on Wheels	Nutrition and Food Insecurity (McKay-Chiasson)	84
3. Community Health	Older Person's Commission (OPC)	Practice of Medicine in the Community (Shajahan)	Not complete
4. Communication in Medicine	HOPE homeless shelter, HOPE recuperative center	Tell Me More: Communication in Medicine (Dillon)	68
5. Global Health	Chaldean Community Foundation (CCF)	Introduction to Global Health (Hajj-Hussein)	Not complete

* Fall 2020 Participation of students at OPC and CCF was limited during the pandemic year.

Evaluation and Outcomes

Data was obtained by end-of-semester surveys of students by Likert responses. Agreement with the statement "Service-learning sessions were aligned to objectives of in-classroom lectures" was as follows:

Year	n	Poor	Below avg.	Average	Above avg.	Excellent
2019	126	1.59	2.38	22.22	27.78	46.03
2020	122	0	1.64	20.49	34.43	43.44

Additional data on student assessments of course themes was collected as multiple-choice and short-essay style formats for lecture-based content. Student narrative reflections on course themes and associated service activities were reviewed using the REFLECT rubric for assessment of reflective writing (Wald *et al*., 2012). Analysis of service sites selected by student teams, and outcomes of reflective narratives following service will assist to better understanding how prior service experience, gender and other factors influence student choice of service engagements (Bringle *et al*., 2006).

Discussion

The PMH3/4 service-learning curriculum for preclinical medical students has potential to enhance student understanding of diverse course themes, promote interprofessional collaboration, and increase interests of students in life-long community engagement. Work to develop community partners' shared commitment to intentional educational outcomes has been a means to strengthen community ties. Some additional benefits of the program were identified as providing interprofessional group learning at OUWB, exploration of interests in community service, and enhancing a positive community presence.

Some challenges were the limitations of time in the curriculum, co-curricular course work load during M2, and response bias. Future research will evaluate parameters of prior experience, and motivations for student engagement with community organizations to support lifelong interests (Conner, 2017).

The authors would like to acknowledge the selfless dedication of our community partners to support OUWB medical students:

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References

- Bringle, R., Hatcher, J., & McIntosh, R. (2006). Analyzing Morton's typology of service paradigms and integrity. Michigan Journal of Community Service Learning, 13(1), 5–15.
- CES curriculum evaluation sub-committee ad hoc report "Service-Leanring & Integrated Community Service Activities at OUWB, (Jannuary 2018).
- Conner, J. and Erickson, J. (2017). When Does Service-Learning Work? Contact Theory and Service-Learning Courses in Higher Education. Michigan Journal of Community Service Learning, 23(2), 53–. https://doi.org/10.3998/mjcsloa.3239521.0023.204
- Giles, D.E. and Eyler, J. (1994). The theoretical roots of service-learning in John Dewey: Toward a theory of service-learning. Michigan Journal of Community Service Learning, 1(1), 77-85.
- Seifer S. D. (1998). Service-learning: community-campus partnerships for health professions education. *Academic medicine : journal of the Association of American Medical Colleges*, *73*(3), 273–277. https://doi.org/10.1097/00001888-199803000-00015
- Wald, H., Borkan, J., Taylor, J., Anthony, D., & Reis, S. (2012). Fostering and evaluating reflective capacity in medical education: developing the REFLECT rubric for assessing reflective writing. *Academic Medicine*, *87*(1), 41–50. https://doi.org/10.1097/ACM.0b013e31823b55fa

Is an Aberrant Obturator Artery a High Risk Yet Rare Lesson for Medical Students?

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Introduction

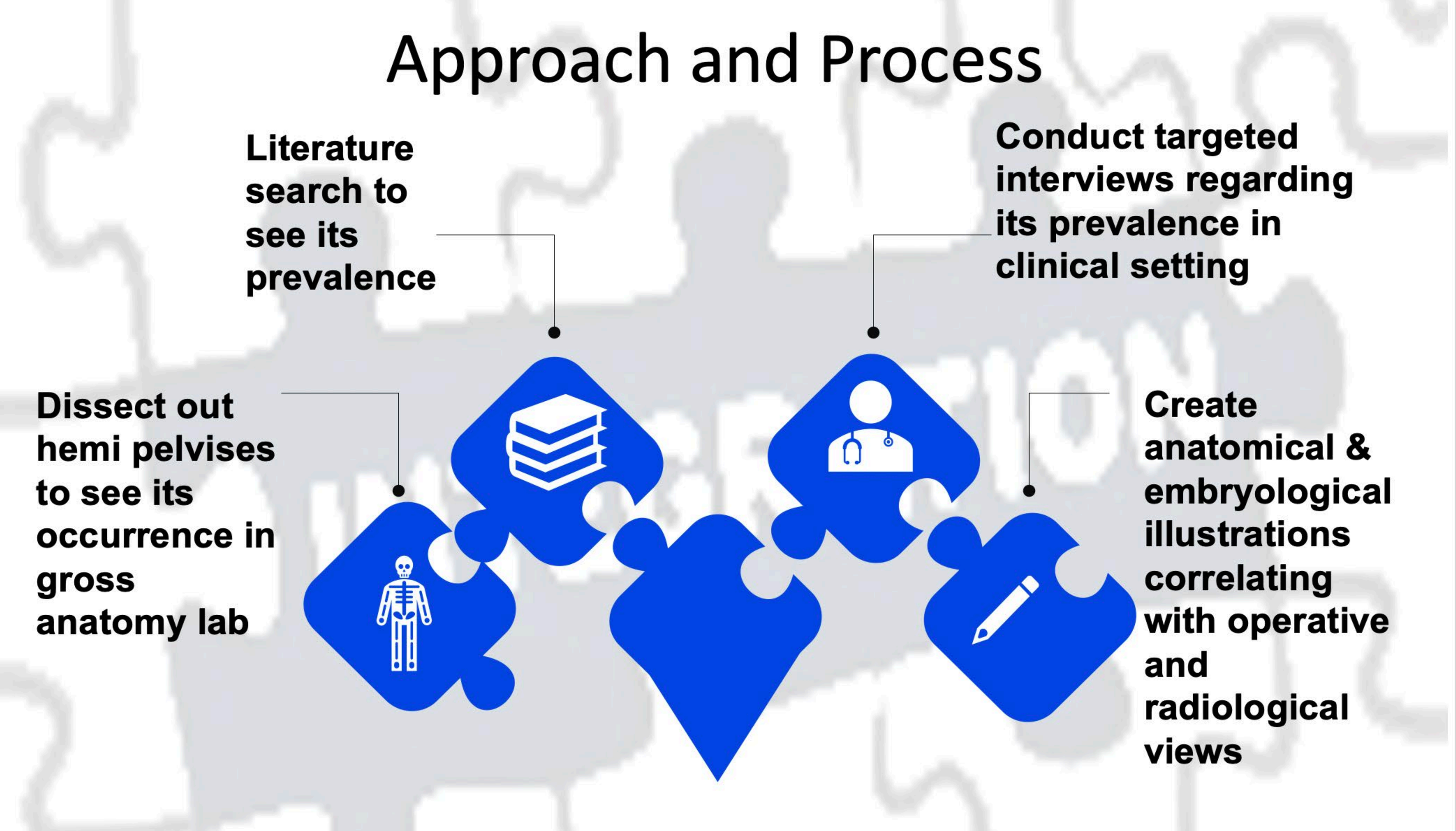
- Anatomical variations in obturator artery (OA) origin have been shown to be common whereby a recent meta-analysis of the overall global pooled prevalence estimate is >45%. Of these vessels, venous vs arterial (42% vs 25%)[1].
-
- Embryologically, the origin of these variations arise from the unusual persistence of blood supplies that would normally obliterate[2].
- Anastomosis between anomalous obturator vessels, external iliac, and inferior epigastric vessels is "Corona Mortis" (COMR), or the crown of death[3].
- The OA and its course are relevant to most inguinal and pelvic surgical procedures. Hence, Knowledge of retro-pubic vascular anatomy is important to prevent vascular catastrophes during surgery.
- If accidentally cut it is difficult to achieve subsequent hemostasis especially during laparoscopic hernia repair or placement of a mesh during open surgery or pelvic surgeries.
- In the event of an erroneous cut, interventional radiologists intervene in order to embolize the source of bleeding.
- Therefore, anatomical knowledge of these variations is important not only as an interesting embryological occurrence but also as important for surgeons and also for interventional radiologists.
- In a competency-based curriculum, it is imperative that learning outcomes and competencies are part of a dynamic process based upon evidence-based findings [4]. (Lockyer, et al., 2017)
- Hence, this project works on highlighting the essential need to integrate foundational science concepts with surgical and radiological applications in order to better benefit medical students in competency-based and evidence-driven curricula.

Aims and Objectives

1.Introduce OA anatomic variations and CMOR concepts for medical students at different phases of their medical education

2.Propose continuous reinforcement and assessment of student knowledge of this concept

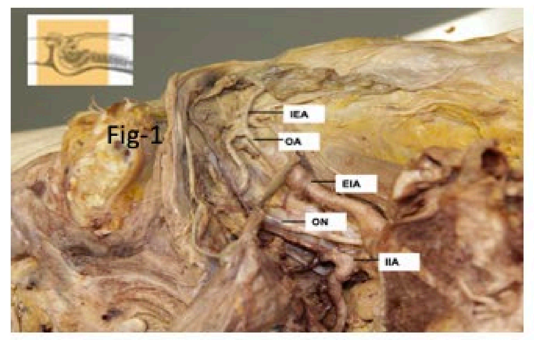
Approach and Process



Results

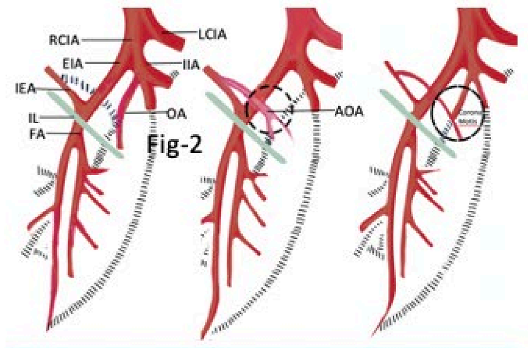
Illustrations of developmental aberrations and pertinent retro-pubic anatomy have been created to explain the origin of Corona Mortis. Additionally, targeted interviews of clinicians revealed its common occurrence and operative images and radiographs have been acquired to show clinical relevance .

Dissection showing abnormal obturator artery



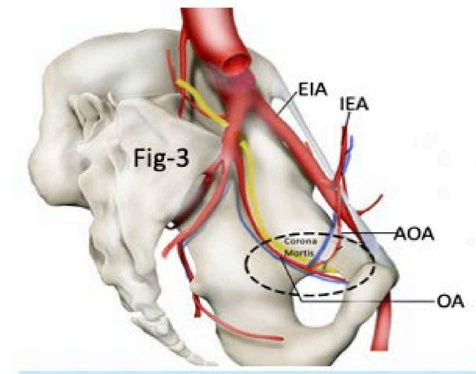
EIA,IIA-External & Internal Iliac arteries ; AOA &OA- obturator & aberrant obturator arteries; IEA- Inferior epigastric artery.
Among 38 hemi-pelvises dissected, in 8 pelvises the AOA (21.05%) originated from the IEA

Development of arterial system – pelvis & lower limb



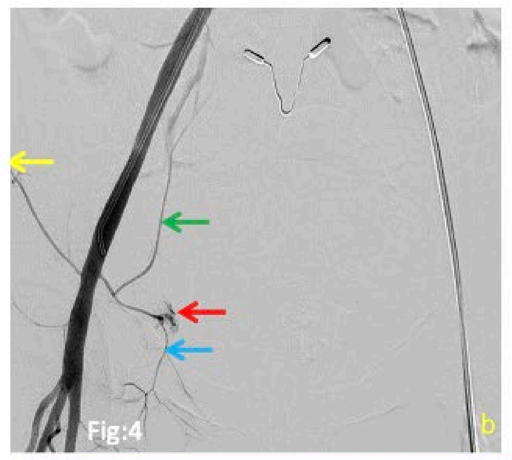
RCIA, LCIA- Right & Left common iliac arteries; EIA,IIA- External & Internal Iliac arteries; AOA,OA- Aberrant & Obturator arteries; Il- Inguinal Ligament; FA-Femoral Artery. ---- Dashed lines represent obliteration of embryonic vessels

Illustration of retro-pubic anatomy - corona mortis



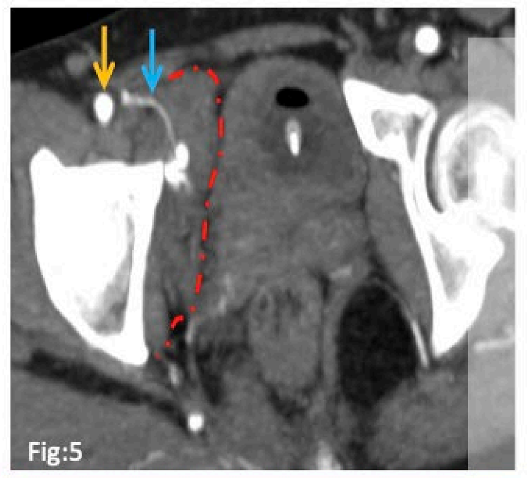
EIA,IIA- External & Internal Iliac arteries; IEA - Inferior epigastric artery; AOA - aberrant obturator arteries ; ON - Obturator Nerve

Digital subtraction angiography (DSA) of external iliac vessels.



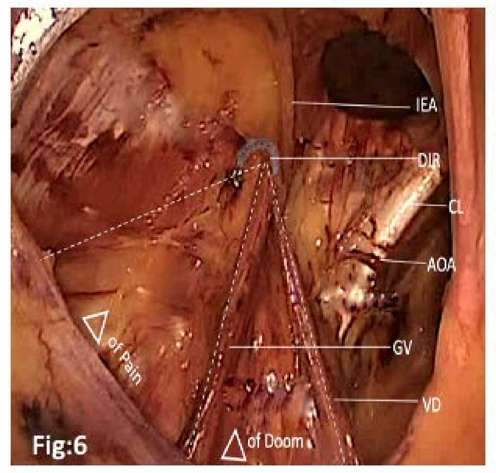
Aberrant origin of obturator artery (Blue arrow) with active contrast extravasation (Red arrow). Note the inferior epigastric artery (Green arrow).

CT angiogram with arterial contrast



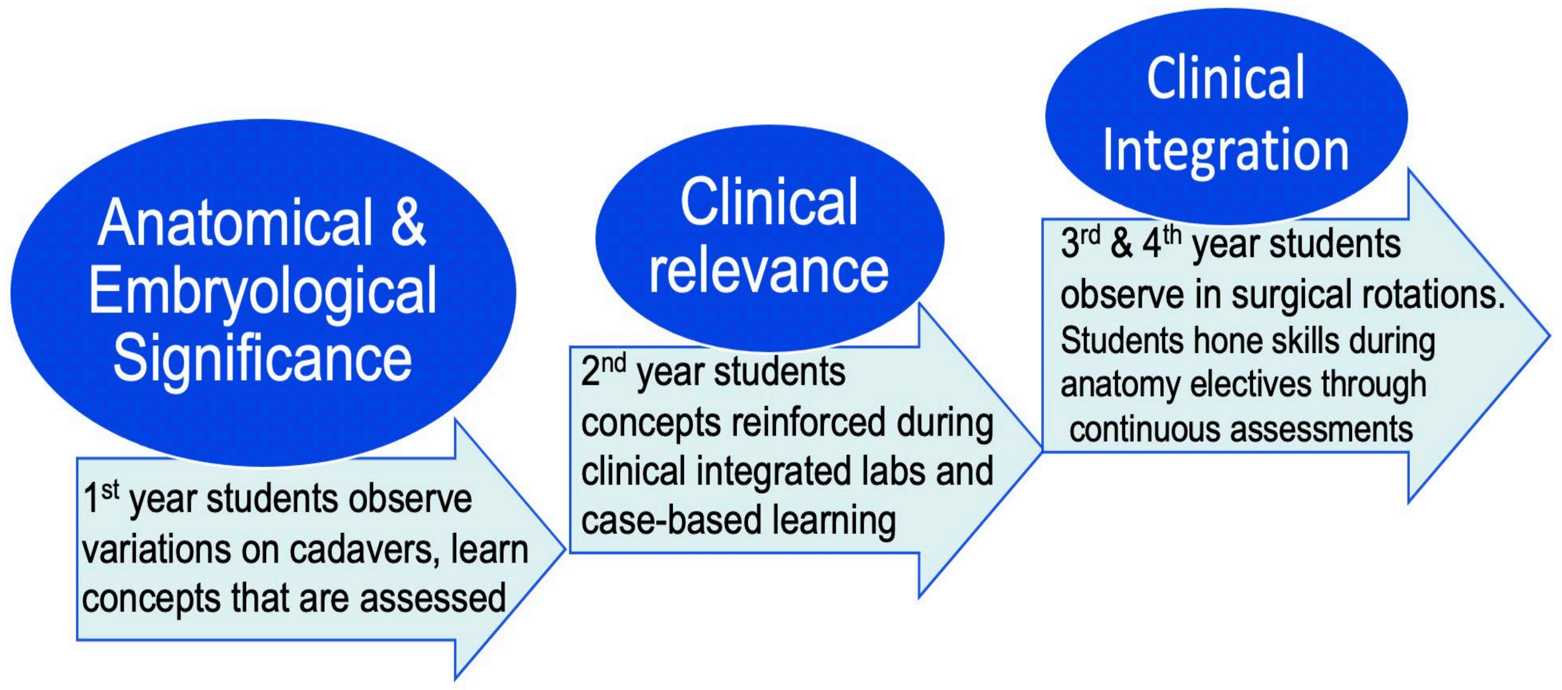
Aberrant obturator artery (Blue arrow) arising from right external iliac artery (yellow arrow) showing arterial extravasation and hematoma in obturator internus muscle (Red outline).

Laparoscopic view of aberrant obturator artery



IEA-Inferior epigastric artery; DIR- Deep inguinal ring; CL-Cooper's ligament; AOA,OA- Aberrant obturator artery; GV- Gonadal vessels; VD- Vas deferens

Integration and Evaluation Plan



Discussion

Given the wide-scope clinical significance that CMOR exhibits across medical specialties, knowledge regarding this vascular anatomic variation of the obturator artery is a crucial teaching topic for medical students.

Recurrent exposure and assessment regarding this topic will better prepare medical students for their residency and clinical practice.

References

1. 1. George Noussios, Nikiforos Galanis, Iosif Chatzis, Sergios Konstantinidis, Eva Filo, George Karavasilis, Anastasios Katsourakis. The Anatomical Characteristics of Corona Mortis: A
2. Systematic Review of the Literature and Its Clinical Importance in Hernia Repair. J Clin Med Res. 2020;12(2):108-114
   2 .J. R. Saundo, M. Roig, A. Rodriguez, B. Ferreira ,A. J. M. Domenech. Rare origin of the obturator, inferior epigastric and medial circumflex femoral arteries from a common trunk. J. Anat. (1993) 183, pp. 161-163,
3. 3. Selçuk İ, Tatar İ, Fırat A, Huri E, Güngör T. Is corona mortis a historical myth? A perspective from a gynecologic oncologist. J Turk Ger Gynecol Assoc. 2018;19(3):171-172. doi:10.4274/jtgga.2018.0017
4. 4. Lockyer J, Bursey F, Richardson D, Frank J R, Snell L, Campbell C, ICBME Collaborators. 2017. Competency-based medical education and continuing professional development: A conceptualization for change. Med Teach. 39(6):617-622.

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Special Interest Track: Building Leaders, Improving Curriculum and Expanding the Scope of Family Medicine

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Introduction

The Special Interest Track (SIT) is, to our knowledge, the first report of a resident developed, resident driven, longitudinal elective embedded within the family medicine curriculum. It is designed to enrich the education and professional development of the resident and enhance the depth and scope of the residency program.

This study presents the key components of the SIT curriculum (Figure 1), the process of developing and implementing the curriculum (Table 1) and the early outcomes of incorporating this curriculum in the Beaumont Grosse Pointe residency program.

Aims and Objectives

Develop a format that can be standardized and reproducible, while allowing flexibility to incorporate creativity and innovation in curriculum design

Minimize the administrative burden on residents & faculty participating in SIT

Incorporate an evaluation process that:

- Ensures the resident is meeting requirements for Family Medicine Curriculum
- Allows longitudinal progress by setting goals and tracking achievements
- Evaluates resident wellness in addition to performance metrics

Continuously collect and analyze data to evaluate and improve the SIT curriculum

SIT Framework

- The SIT curriculum is developed by the resident and presented to GME leadership for approval (Figure 1)
- GME incorporates the SIT into the resident's schedule
- CHECKPOINTS and Evaluations performed every 6-months
- The Faculty Advisor recommends if resident can continue at the scheduled pace or if adjustment is needed

Methods of Evaluation

Wellness surveys: to participants and non-participants every 6-months

Performance metrics evaluated in cohorts of participants & non-participants every 6-months

- in-service exam scores
- required encounters towards graduation
- ACGME milestones & rotation evaluations

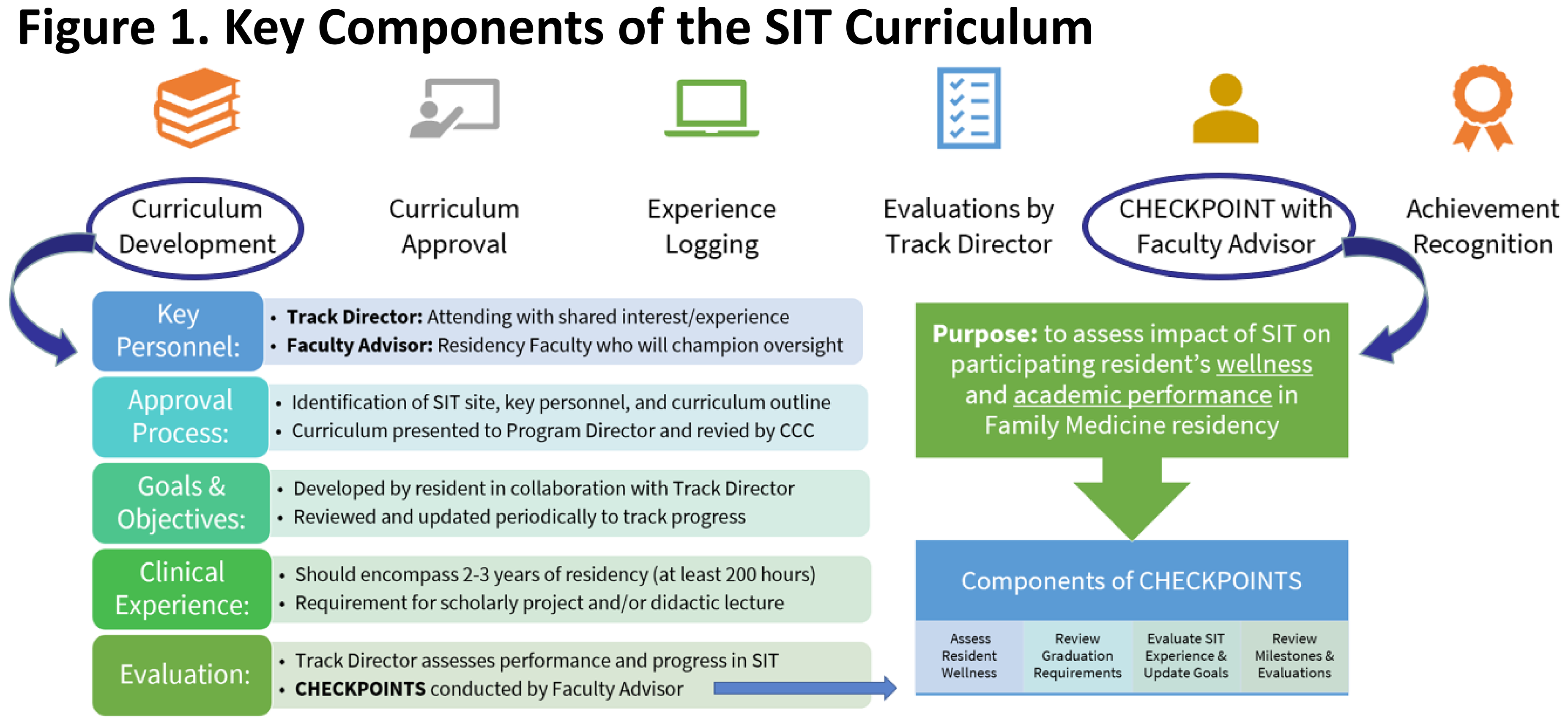
Participation data: reviewed annually to gauge interest in SIT, examine factors impacting participation, and implement improvement processes

Alumni surveys: evaluate impact of SIT on future career

Table 1. Approach/Process

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Assess the Current State	Develop the Framework	Gauge Interest	Identify/Address potential pitfalls	Develop an Evaluation/ Improvement Process
• Analyze ACGME, ABFM and Institution requirements • Evaluate FM curriculum to identify where the SIT can be incorporated	• Identify key components (Figure 1) • Identify key personnel & define their roles • Create necessary templates, processes & evaluation tools	• Introduce framework to GME leadership and residency at large • Survey residents and attendings	• Utilize data from various sources (survey, focus groups, feedback) • Implement CHECKPOINTS	• See "Methods of Evaluation" → **Implement**

Figure 1. Key Components of the SIT Curriculum



Expected Results

Resident Impacts

- Incorporation of interest/passion in training
- Early career development
- Individualized education
- Leadership experience
- Mentorship opportunity
- **Performance metrics**
- **Amount of responsibility/workload**
- **Progress to graduation requirements**

CHECKPOINT

Program/Faculty Impacts

- Increased administrative burden
- Appeal to future applicants
- Network with subspecialists
- Diversify curriculum
- Opportunity to share knowledge in "niche"

Discussion

The majority of residents & faculty surveyed expressed interest & intent to participate

The SIT was launched in December 2020

- Current tracks in (1) wound care and (2) sports medicine
- Proposed tracks by current residents: behavioral health, community medicine, women's health and osteopathic manipulation

Limitations

- Early in process, hypothetical impacts
- Launched at a small, unopposed, community FM residency program
  - May not be generalizable to all programs or specialties
  - Small sample size

Future studies

- Create a standardized and reproducible implementation process
- Examine the impact of the SIT curriculum on residents, faculty and the program

Predicted Impact:

- Increase the chance to perform meaningful work in career (decrease burnout)
- Expand the scope of Family Medicine
- Provide graduates with the skills to innovate and lead

References

1. Shanafelt, T. D., West, C. P., Sloan, J. A., Novotny, P. J., Poland, G. A., Menaker, R., ... & Dyrbye, L. N. (2009). Career fit and burnout among academic faculty. Archives of Internal Medicine, 169(10), 990-995.
2. Young, J. Q., Schwartz, J., Thakker, K., O'Sullivan, P. S., & Sugarman, R. (2020). Where Passion Meets Need: a Longitudinal, Self-Directed Program to Help Residents Discover Meaning and Develop as Scholars. Academic Psychiatry, 44(4), 455-460.
3. S Stevenson, M. D., Smigielski, E. M., Naifeh, M. M., Abramson, E. L., Todd, C., & Li, S. T. T. (2017). Increasing scholarly activity productivity during residency: a systematic review. Academic Medicine, 92(2), 250-266.
4. Friedman, K., Lester, J., & Young, J. Q. (2019). Clinician–Educator Tracks for Trainees in Graduate Medical Education: A Scoping Review. Academic Medicine, 94(10), 1599-1609.
5. Sandars, J., & Cleary, T. J. (2011). Self-regulation theory: applications to medical education: AMEE Guide No. 58. Medical teacher, 33(11), 875-886.
6. Ahn, J., Martin, S. K., Farnan, J. M., & Fromme, H. B. (2018). The graduate medical education scholars track: developing residents as clinician–educators during clinical training via a longitudinal, multimodal, and multidisciplinary track. Academic Medicine, 93(2), 214-219.

Education Can Prevent Medication Misuse in Clinical Practice

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Introduction

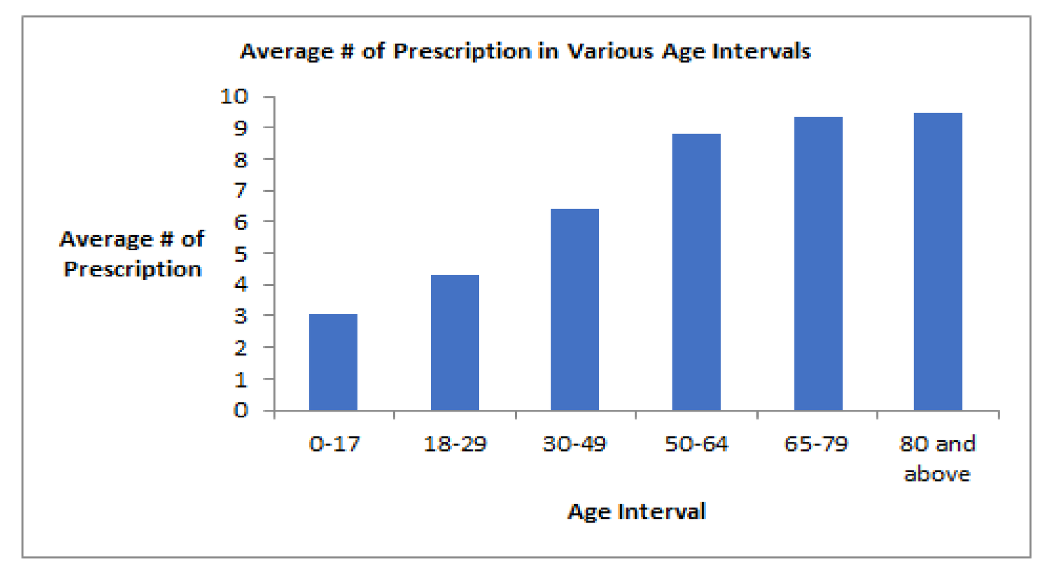
Polypharmacy refers to the concomitant use of multiple medications (at least 5) to treat one or more health conditions in a patient.[1] Polypharmacy can be appropriate when medication is optimized and is according to best evidence. However, it is inappropriate usually or excessive when prescribed medications are more than 10.[2,3] Several factors including increasing age, having multiple medical conditions managed by different specialties, chronic medical conditions, and being managed in a long-term care facility can be responsible for patient-related polypharmacy.[1,5] On the other hand, poor medical record keeping, automated refill systems, poor transitions of care and prescribing by disease-specific quality metrics are some of the factors responsible for health system-related polypharmacy.[1]

Aims and Objectives

To reduce medication burden and harm by providing practical educational strategies and tools for use by educators training medical students and residents.

Approach/Process

Polypharmacy is very common and mostly seen in the elderly and younger at-risk patients.[1] It has become a growing problem in the United States with about 10 percent of the population and 39 percent of older adults in the US practicing polypharmacy. [4,7,11]



Polypharmacy at a Health system in Michigan

The proposed health systems-targeted approach is through the training of medical students and residents in the use of de-prescribing methods and tools.[1] This training by educators will involve safely removing potentially inappropriate medications, involving pharmacists, asking patients about other physicians, and medications already on, using technology tools that deliver accurate prescription data and trying behavioral strategies before adding a new medication. De-prescribing tools to be employed can either be explicit tools such as Beer's Criteria, STOPP (screening tool of older people's prescriptions) and START (screening tool to alert to right treatment) criteria and Medication Appropriateness Index or implicit tools such as the ARMOR protocol.[9,-11]

Evaluation Plan

Medical schools and residency programs adopting these interventions can be evaluated through randomized clinical trials, before-and-after studies on interventions targeting polypharmacy in a clinical setting to assess significant improvements such as mean number of drugs, potentially inappropriate prescriptions (PIPs), cognitive impairment, hospital admissions, falls, mortality etc.[8-10]

Expected Results

Following adoption of these interventions, the expectation is significant reduction in adverse drug reactions, drug-drug interactions, falls, and improved cognitive ability, and overall quality of life.[11] A Cochrane systematic review by Cooper et al. assessing the result of these interventions in the older population showed reductions in inappropriate prescribing.[9,11]

Discussion

One of the biggest challenges to de-prescribing is time constraints during physician-patient interactions preventing shared decision-making.[1] Since prescription refills are mostly automated, discontinued medications may be continued for a long time due to unclear communication between the physician and the patient.[1] Integrating these proposed tools however, into the medical educational system helps ensure a therapeutic approach to polypharmacy.[1]

References

1. Halli-Tierney, A. D., Scarbrough, C., & Carroll, D. (2019). Polypharmacy: evaluating risks and deprescribing. American family physician, 100(1), 32-38.
2. Duerden, M., Avery, T., & Payne, R. (2013). Polypharmacy and medicines optimisation. Making it safe and sound. London: The King's Fund.
3. Wright, C. Polypharmacy Demographics: Studying The Rise in Over Prescribing.
4. Quinn, K. J., & Shah, N. H. (2017). A dataset quantifying polypharmacy in the United States. Scientific data, 4(1), 1-11.
5. Valenza, P. L., McGinley, T. C., Feldman, J., Patel, P., Cornejo, K., Liang, N., ... & McNaughton, N. (2017). Dangers of polypharmacy. In Vignettes in Patient Safety-Volume 1. IntechOpen.
6. Gabauer, J. (2020). CE: Mitigating the Dangers of Polypharmacy in Community-Dwelling Older Adults. AJN The American Journal of Nursing, 120(2), 36-42.
7. Steinman, M. A., Miao, Y., Boscardin, W. J., Komaiko, K. D., & Schwartz, J. B. (2014). Prescribing quality in older veterans: a multifocal approach. Journal of general internal medicine, 29(10), 1379-1386.
8. Ilić, D., Bukumirić, Z., & Janković, S. (2015). Impact of educational intervention on prescribing inappropriate medication to elderly nursing homes residents. Srpski arhiv za celokupno lekarstvo, 143(3-4), 174-179.
9. Cooper, J. A., Cadogan, C. A., Patterson, S. M., Kerse, N., Bradley, M. C., Ryan, C., & Hughes, C. M. (2015). Interventions to improve the appropriate use of polypharmacy in older people: a Cochrane systematic review. BMJ open, 5(12), e009235.
10. Patterson SM, Hughes C, Kerse N, Cardwell CR, Bradley MC. Interventions to improve the appropriate use of polypharmacy for older people. Cochrane Database of Systematic Reviews 2012, Issue 5. Art. No.: CD008165. DOI: 10.1002/14651858.CD008165.pub2. Accessed 03 April 2021.
11. Rankin, A., Cadogan, C. A., Patterson, S. M., Kerse, N., Cardwell, C. R., Bradley, M. C., ... & Hughes, C. (2018). Interventions to improve the appropriate use of polypharmacy for older people. Cochrane Database of Systematic Reviews, (9).