University of Louisville School of Medicine
Trover Campus
200 Clinic Drive
Madisonville, KY 42431
(270) 824-3515 or (800) 217-9149

https://baptisthealthdeaconess.com/ultc

History of the Campus

All or portions of 85% of Kentucky's counties are considered to be health professional shortage areas, having far too few primary care physicians. Despite a recent increase in the number of primary care physicians trained by U.S. medical schools, the number in non-urban areas has not changed over the last 20 years. The published literature shows clearly that doctors tend to set up practice in towns like those in which they train. The pipeline to the production of rural physicians begins with high school and continues through the retention of rural physicians in practice. This pipeline is described as "leaky," with many opportunities along the way for rural students to become attracted to big-city life during their education. Because of the "leaky pipeline" phenomenon, some medical schools now have regional rural campuses that provide an opportunity for students to spend the last two years of clinical medical school training in smaller towns.

Studies from the two traditional medical schools in Kentucky showed that there are some predictors of who will ultimately practice in rural areas in Kentucky. The study from the University of Kentucky (UK) supported the "affinity model" that suggests that a student who has a positive experience growing up in a small town is more likely to practice in a similar-size town. The study from the University of Louisville also supported the affinity model, but the mathematical model was better at predicting who would not ultimately practice in a rural area. The authors suggested that to make a significant impact, our medical schools would have to admit more of those from rural backgrounds, including some who are not currently applying. Although there are no published reports as yet, the Pikeville College School of Osteopathic Medicine (PCSOM) is an osteopathic initiative based on the affinity model, intended to produce physicians primarily for rural eastern Kentucky.

Education is a central element of Baptist Health Deaconess Madisonville (formerly Trover Health System), begun more than 60 years ago in Madisonville by brothers Loman and Faull Trover. As it has developed into a modern rural integrated health system with a large multi-specialty clinic and a regional tertiary care hospital, education remains in the core mission. Trover Heath System began the first Family Practice residency in the state in 1972, and 80% of the 247 graduates practice in rural areas. Over 40 years ago, the U of L Department of Surgery began the Surgery Project that places 4-6 third-year medical students (M-3) at Trover each 8 week block for their required general surgery rotation.

The next phase of rural medical education at Trover began with the collaboration with U of L that created the Off Campus Teaching Center in Madisonville. Begun in 1994 with a proclamation by Governor Brereton Jones, only summer programs were supported until 1998. During 1998-2000, the effort was supported by one-time equal contributions from U of L and Trover Health System. These contributions began the period of clinical campus activities, allowing rising third-year medical students to move from Louisville to Madisonville for their entire third and fourth years of training. During this period an on-site Associate Dean was recruited and the campus graduated 3 students, all entering FM residencies.

In 2000, the Madisonville program was continued through a special initiative from Governor Paul Patton's office using coal severance funds. During this time the Trover Campus further developed the pipeline activities, including college premedical programs and a High School Rural Scholar Program. The high school program

was developed in close collaboration and co-sponsored with the West Kentucky Area Health Education Center (WAHEC). This program placed students in health care settings in their hometowns and provided a virtual classroom to assist them with development of skills needed to increase their chances to enter and complete a premedical curriculum. Although there are other programs that give these rural students the opportunity to go to a big city for a similar experience, the negative message in these programs is that to do something really special in health care one must leave the rural area. The Trover Campus program reverses that process, bringing the classroom to the students, allowing them to discover the positive aspects of small town practice as they shadow health professionals in their hometowns. Also in 2000, an elective course in Rural Medicine for M-2 students was developed in collaboration with the KAFP.

In 2002, the campus graduated 5 students who entered primary care residencies (2 FM, 2 OB/Gyn, and 1 Peds). The High School Rural Scholar program was expanded to 15 students and the virtual classroom activities increased significantly in sophistication through collaboration with Murray State University. Students from 91 Kentucky counties and 26 states have participated in the Madisonville programs so far. The Trover Campus is unique and represents the best in collaboration between an urban medical center (U of L) with a commitment to train physicians who meet the state's needs and a rural integrated health system (Baptist Health Madisonville) with a 50-year experience in training students. In addition, the administrative infrastructure now includes an on-site Associate Dean, and other support staff. This allows the further development of the necessary pipeline activities for students beyond those at U of L.

Universities that have participated in the Trover Campus summer programs		
Murray State	University of Louisville	Eastern Kentucky
Kentucky Wesleyan	Bellarmine	Transylvania
Brescia	Centre College	Campbellsville
Western Kentucky	University of Kentucky	Madisonville Comm. College

The campus does bring new costs. In addition to the personnel, the rural campus required new funding for video-conferencing equipment, as the Trover-based students receive all the same lectures as the Louisville-based students in real-time by interactive video connections. Fortunately, no additional facilities were required because of the contribution of existing facilities by the Trover Foundation. With strong support from U of L, a proposal for Trover Campus funding was approved by the Council for Postsecondary Education for the 2002-2004 biennium, again funded by coal severance funds. Strong support from the Governor’s office has continued since, with continuing coal severance funding. During the U of L Medical School accreditation visit in 2005, the LCME cited the regional Trover Campus among the 10 strengths of the entire School of Medicine, a remarkable statement rarely made by this organization. In 2013, a HRSA report conducted by the University of Colorado ranked the ULTC second among all 35 Rural Medical Education programs in the U.S. For the 2016-2018 biennium, the Trover Campus received a 30% decrease in coal severance funding. In 2018, all coal state severance funding ceased, and efforts to obtain new state funding were unsuccessful. The future of the campus depends on finding new sources of funding.

The Trover Campus has continued the development of all aspects of the rural education pipeline. This includes active involvement with the U of L admissions process to facilitate entry of more rural students. Almost 30 years of studies show that while students from rural backgrounds (and therefore much smaller high schools) have lower overall math and science scores on standardized tests, once they are admitted to medical school, they perform on par with their urban classmates. Using the affinity model, students from small towns (whether or not they are designated Health Profession Shortage Areas) are more likely to choose small towns to practice. The Trover Campus exists to give those students another two years away from the "urban disruption" that may result in their being attracted to a big city. At the same time, the campus provides the one-to-one

instruction that community-based programs offer. Activities will continue at the premedical and high school levels to facilitate the success of promising rural students to prepare them for admission to medical school. Following the findings of almost 40 years of experience with regional campuses in other states, the Trover Campus continues to place practicing physicians in Kentucky's smaller towns. This addresses the many health problems created by inadequate access to medical care. In addition, physician recruitment is a powerful economic engine for Kentucky's small towns. The Trover Campus Rural Pathways programs promote health careers at the high school and college levels, ultimately leading to more medical school applicants from small towns. This initiative is a unique collaboration, carefully crafted and proven, to assist development of Kentucky's rural areas into the CPE's vision of: "vibrant communities offering a standard of living unsurpassed by those in other states and nations."

U of L Trover Campus Classes of 2023, 2024 and 2026

1. **RMAT (Rural Medicine Accelerated Track)**

A small number of University of Louisville Trover Campus students have the option to be considered for the Rural Medicine Accelerated Track (RMAT), which leads to completion of their medical degree in a total of three years. The ULTC was the second such U.S. program to receive accreditation in 2011.

The track for completion of medical school in 3 years saves a year of time and tuition, allowing the ULTC RMAT graduate to start residency a year earlier. However, it is only for very motivated students who are sure they want to practice primary care in a small Kentucky town. It is a competitive process, with the decision made after the student has demonstrated solid academic progress in the first 3 semesters of medical school and outstanding performance during the RMAT1 and RMAT2 sessions completed after the M-1 year.

The program has graduated 5 students so far and all are in rural practice near their hometowns. Two RMAT positions will continue to be offered each year.

Timing and Focus

RMAT 1	4 week summer after M-1 year in rural practice near hometown. Continuity of care and detailed practice assessment
RMAT 2	4 week summer after RMAT-1 in Madisonville. Adolescent health and county-wide health assessment
RMAT 3	4 week rural community health rotation after M-2 year. Performance improvement in continuity care for uninsured, working poor.
RMAT 4	6 week Acting Internship in Madisonville. Includes USMLE Step 2 CK prep
RMAT 5	4 week rural Family Medicine clerkship at the end of the M-3 (final) year

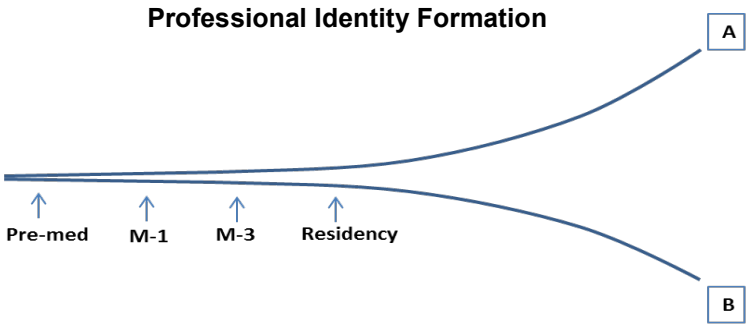
2. Service Learning

Each summer since 2006, rising M-2 medical students at the Trover Campus have participated in experiential learning in an underserved area. Since 2008, the group included College Rural Scholar pre-medical students from rural towns who are interested in returning to this campus for their M-3 and M-4 years. The activity is called Preclinical Student Screening Teams (PSST).

In the summer of 2006, 2 local HPSA communities identified the provision of school physicals for 6th graders as an important need. Cost and access were the primary issues, with only one provider in each community providing the required sports physicals. In each case, the school-based family resource center communicated the need to their AHEC. The AHEC worked with community contacts to establish the best place and time for these exams.

Teams of preclinical and pre-medical students provide over 80 exams each summer, supervised by a family physician, with each team led by an experienced nurse at the health department site. Preparation includes training in community assessment, patient education, and age-specific history and physical examination skills. The preclinical (rising M-2) student conducts the individual assessment, supervised in the room by the nurse, assisted by the pre-med student. Each 6th grader and parent is then accompanied to a patient education area for a customized session conducted by the pre-med student, assisted by AHEC staff. All medical issues are confirmed by the family physician and appropriate referrals arranged through the school nurse. Our experience with this community-based service learning laboratory was recently published in the Journal of the Kentucky Medical Association. These community activities were paused in 2020 because of the pandemic, and were resumed in 2021.

3. Professional Identity Curriculum



Medical students learn not only how to act like their mentors but actually take on the identity of a physician. During the 2015-2016 academic year, the ULTC began a formal professional identity curriculum to facilitate this process. The year began with a baseline measure of empathy, and students at each level also completed a career eulogy as a reflective exercise. Each month, one of the scheduled Dean's Hour sessions is dedicated to a literature summary of development of professional identity including concepts of cynicism and burnout. Then exercises of reflection, mindfulness and self-assessment are continued across the academic year. The curriculum continues with modifications based on student feedback. Longitudinal measures of empathy across all 4 years of medical school continue and initial results have been published.

4. Community (Free) Clinic

HCCC
HOPKINS COUNTY COMMUNITY CLINIC

The Hopkins County Community Clinic was founded in April, 2004 to serve the working uninsured poor. A single evening session each week is staffed primarily by medical students, supervised on-site by volunteer local primary care physicians. The ULTC regional Dean serves as the medical director of the student directed clinic. A volunteer community board sets policy for the clinic. Since the advent of the ACA, our clinic also serves the underinsured who have poor access to primary care. This experience can provide elective curriculum credit for the student who completes a performance improvement project. The in-person clinic was paused because of the pandemic in March 2020, re-started in June, and then transitioned to almost entirely telemedicine in September, 2020. We have included essays from students about this experience below.

Micah Kaiser

The Hopkins County Community Clinic is a free clinic that we operate to serve those in need in our community. In the clinic, we have our own patients who we regularly see for follow-up visits, new complaints, and regular health screening.

Furthermore, we recently established a new protocol to see patients at the homeless shelter where we do cardiovascular screening. This allows us to have patient encounters with people who are chronically underserved medically. Originally, we would refer patients with abnormal screenings to either see a doctor or follow up with us later in the free clinic. However, we found that these patients frequently had difficulty following up for several reasons. A few being lack of access to telephones, transportation, and time. As a result, we began doing free clinic visits in the homeless shelter for folks who need us. Thus, I have several patients that I see regularly in the homeless shelter for their various needs who would not receive care otherwise.

The free clinic has really allowed me to have a lot of autonomy and responsibility over the care of my patients. A supervising physician always sees them after me, but much of their care falls on my shoulders. It has been very cool to have this level of trust with my patients, and in a sense be “their doctor.” If I did not see them, or if the clinic didn’t see them, then they would likely not be able to receive timely medical care. It has allowed me to frow in my comfort of managing many medical conditions and taking responsibility for my patients’ medical care. Often times, it is a reminder of why I entered medical school in the first place: to help those in need.

Chelsea Lancaster

The Hopkins County Community Clinic is a free clinic that Trover 3rd year students run with Dr. Crump that provides primary care services to medically underserved patients. We are assigned 2-3 patients to follow their care and act as their primary care physicians. We follow up with them regularly and are able to order lab work, run diagnostic tests, prescribe medications, etc. under the supervision of Dr. Crump. We learn how to do things cost-effectively and only order things that are absolutely necessary. The free clinic has shown me how to be more intentional about the cost of the things I am ordering and how many patients have varriers to adequate care. Currently, we are doing all of our visits with the patients virtually. I think learning how to do telemedicine will benefit us all in the future because it is likely that there will be continuing developments in technology making Telehealth more prominent. The clinic is very beneficial to the patients and the community because most of these patients have chronic disease that they would otherwise not have someone following because they cannot afford the healthcare. During my time working with my patients at HCCC is when I really learned how to be responsible for patients and more of what it is like to be a doctor, instead of a student.

5. **Community Cardiovascular Screening**

As we discovered that the population we seek to serve has trouble getting to our clinic, we began going to them in the summer of 2017. Directed by a steering committee of informal community leaders, we now do cardiovascular screening at the time and place chosen by those who know each subgroup. Our screenings are unique in that we do not choose the time and place, and each screened participant with a need can leave with an appointment to be seen at our community clinic within a week. Our long-term vision is to host clinics at natural gathering sites such as food banks and community events. This effort provides a real-world community medicine education for our students. These activities were paused because of the pandemic in March 2020. We resumed the screenings in June, 2021 and began temporary clinics on site during screenings at local food banks. These activities were noticed by the local newspaper, shown below.

Changes happening at Madisonville Salvation Army Madisonville Messenger

By Jodi Camp Reporter jcamp@the-messenger.com Jun 23, 2021

As the seasons change, the Salvation Army in Madisonville is changing too.

After years of only being a winter weather shelter, the Salvation Army is now an all-weather shelter. Salvation Army Captain Lisa Good said an all-weather shelter means they can stay open 24/7 all year to house people, instead of just six months for only 12 hours. “This year we have been able to maintain funding,” she said.

By this time in past years, the shelter normally has no one who needs shelter, but they have a full house and have stayed full, she said. They are taking care of 20 to 25 residents at a time. “People have been needing to come in out of the heat, so we have been able to provide housing,” said Good. “As long as we can keep the funding coming in, we are going to be able to provide it.” Good said the Salvation Army has already applied for more funding to stay open all year, and as the funding continues, they will be able to maintain the all-weather shelter. If they can’t continue to find funding, then the shelter will close on March 15, 2022. She said the community has been very supportive in donating items and money to keep the shelter going. Another change is that Dr. Bill Crump, the dean of the medical school at the University of Louisville Trover Campus, will be bringing his third-year medical students by the shelter to offer health care screenings. “We find that a lot of our residents have health issues that have not been seen,” said Good. “We are starting to give them better health care.” Crump said his goal is to find people in the community who do not have good access to primary care. “We do the screenings, check blood sugar, check blood cholesterol, check blood pressure, ask folks questions about their activity and smoking,” he said. “All the routine kind of stuff.” 0p)

Before COVID-19, the students, under the direction of Crump, were going to Breaking Bread and Christian Food Bank at least once a month to offer health care check-ups. Now, they can add the Salvation Army to the list of places they visit. “We are just now getting started back,” said Crump. “We try to go to places where folks don’t have good access.” He said two things that make them different than other places are that the students only go where they are invited, and every patient walks away from the screening with an appointment at the free clinic already set up. “Most of the time if you go through the screening, they will say call this number and make an appointment at our free clinic,” said Crump. “People leave our screening table with an appointment.” Since stops to the Salvation Army are new this year, they are trying to find out what is needed to determine how often the students will visit, he said. Along with health care, the Salvation Army is also doing remodeling with the soup kitchen with new floors being installed and fresh paint on the walls. “The jail came and was able to paint our kitchen and we are getting new fresh floors in there,” said Good. “We are very grateful.” Since the shelter can house people for the entire year and it is full, they need donations, she said. Snacks, bottled water and pillows are a big need right now. “We are very low on pillows because with COVID we have to get rid of them,” said Good. They will also accept donations of oatmeal, cakes, brownies and Little Debbie cakes, she said, adding that milk, paper towels and toilet paper are needed as well. Good said volunteers would also be appreciated. Anyone interested can stop by and talk to Crystal Doss, and she can work them into the rotation.

The Salvation Army is located at 805 McCoy Avenue. For more information, call 270-821-8112

Cody Tucker, a third-year medical student at the University of Louisville, sets up a blood sugar and blood cholesterol test to screen for any problems the resident may have. The students, who are part of the branch campus in Madisonville, will visit the Salvation Army to monitor the residents’ health.

Devin Clark, third-year medical student at the University of Louisville, helps Cheryl Redd answer a series of questions to better understand her medical history, so he can determine where to start the screening process. The medical students will start visiting the Salvation Army to screen and keep the residents' health care in check.

Photos by Jodi Camp/The Messenger

Devin Clark

During my community medicine elective with Dr. Crump, we focused our attention on the community's disadvantaged patient population. We spent our time devising a system that would allow 3rd and 4th year medical students to act as patient navigators at our local resident clinic. We met with the clinic's lone social worker to better understand the patient population. We found that many patients don't have access to proper housing, hygiene, food/water, or reliable transportation. We also met with the president of ARCH, a large community outreach program in Madisonville and began compiling resources to offer our patients. Ultimately, we decided that medical students would be assigned 2-3 challenging patients at the start of their third year and would follow these patients during clinicals.

I've always valued community involvement. During my undergraduate years, I often volunteered at Habitat for Humanity, Relay for Life, and hosted multiple blood drives for the American Red Cross. Each time I served; I felt a sense of pride helping those less fortunate than myself. While working on this project, alongside Dr. Crump, some of those feelings of pride were rekindled. To be honest, I sometimes feel a sense of "isolation" when practicing clinical medicine; especially when interactions are confined to 10-minute appointments with hardly enough time to exchange pleasantries with patients. With large-scale community projects and research, there's more collaboration between medical professionals and community members. You work alongside social workers, food banks, churches, and local businesses. It draws you closer to your neighbors, builds connections, and allows you to grow with community members. Another aspect of community medicine that I enjoy, is being able to build on an ongoing project. For our proposed plan, it may take years, even decades, for community problems to be addressed. Although the work is tedious, we hope to address (or perhaps prevent) root problems. Overtime, this will have a larger impact on community health compared to temporary solutions, like medications.

I plan to enter Family Medicine, which has a large community component to it. Regardless of what specialty I go into, I'll continue to volunteer and consider the needs of my community. A good rule of thumb is to start compiling a list of community resources soon after you arrive to a new area, including housing options, addiction clinics, and programs geared towards lower socioeconomic families. To get more involved with community medicine, I plan to reach out to local departments to see what resources they have to offer. I can

also contact other physicians directly to get their recommendations and to inquire about ongoing research projects.

ULTC Program Summaries

The following summary of the Trover Campus programs is organized by the nine objectives that guide program development.

Objective 1: Expose rural high school students to summer preceptorships in medical careers.

HIGH SCHOOL RURAL SCHOLARS

Medical students from rural communities are the most likely candidates to practice in a rural setting upon completion of training. The High School Rural Scholars program provides an opportunity for high school students from a rural area with interest in health careers to gain exposure to health professions as well as improve their chances for success in post-secondary education.

The High School Rural Scholars Program participants are engaged in observations of health care services in their home counties while being able to live at home for the duration of the summer program. In the HSRS, students divide their time between shadowing health care professionals in their home counties and college entrance exam preparation.

2021 Virtual Anatomy Class

The Trover Campus serves as the central support site for the program (1). Students from Hopkins County and the four contiguous counties are considered for the program. All 5 counties are rural, and 3 are designated as Health Profession Shortage Areas (HPSA). To date, 311 students have participated in this program.

The High School Rural Scholars program allows students entering their senior year of high school to experience health care professions without having to leave home. This program has been shown to foster interest in rural health care. The HSRS program continues to make students aware of the need for rural health care providers and encourages these students to return to rural areas to practice in the future. To date, 75% of former HSRS are in or have completed some kind of health career training program, and 7 former HSRS students have completed medical school. Because of the pandemic, HSRS was all virtual in 2020. We resumed in person shadowing in 2021.

Objective 2: Support academic success of rural premedical students

COLLEGE RURAL SCHOLARS

The College Rural Scholar program was begun as a pilot in 2002. This program is designed for students from rural western Kentucky counties (PEPP and non-PEPP) who may be most likely to become physicians and return to similar communities. The students are nominated as early as their first term in college, and those selected become scholars the following summer. They receive a small academic scholarship during their last three years of college and participate in a three-week summer session each year.

The summer program in Madisonville includes academic enrichment, shadowing physicians, and a series of Rural Health Seminars (2). These scholars also receive mentoring from current M-3 and M-4 students in Madisonville. The goal is to facilitate academic success for the pre-medical students and provide tangible evidence to a medical school admissions committee that these Scholars have invested time in understanding the practical details of rural practice. Some are nominated for an early admission assurance option to U of L Medical School. Through July 2022, 110 students have participated. Nine former High School Rural Scholars have participated in the College Rural Scholar program, 41 CRS have graduated from medical school and 15 former CRS are in medical school.

2022 PSST Teams – Preclinical and College Rural Scholar Students

Objective 3: Facilitate medical school admission of students in the "rural non-PEPP" category

RURAL ADMISSION INITIATIVE

Students from rural counties that are not medically underserved have greater opportunities to receive mentoring from local physicians, which fosters interest in a medical career. This is the basis of expanding the definition of "rural background" beyond the PEPP-designated counties. Although not extensive, the available literature supports the concept that medical students from small towns are more likely to practice in small towns after completion of their training. Frequently, they return not to their hometown, but one that is very similar. This finding is true even if their hometown had an adequate number of primary care physicians. In fact, in the most popular "affinity model", a student with good role models of small town practice would actually be more likely to choose small town practice later. This means that requiring a Health Professions Shortage Area (HPSA) designation to define "rural" for admissions purposes is counter-intuitive.

Kentucky Rural Non-Pepp Counties	
Boyle	Martin
Carlisle	Mason
Carroll	Owen
Clinton	Robertson
Cumberland	Russell
Floyd	Washington
Johnson	Wayne
Lewis	

If there is any basis for providing special consideration in admissions for rural students, it is based on possible academic disadvantages inherent in small town schools. Even in a town with an adequate number of physicians, small town schools lack the resources of larger towns and are historically weak in math and science education. This logically leads to slightly lower math and science college GPA and MCAT scores. This has been the finding of those medical schools that have a special rural admissions track. However, once admitted to medical school, these students perform on par with their classmates from larger cities.

Rural Non-PEPP counties were identified utilizing the percent of county population considered rural/urban, calculated by the Kentucky State Data Center, and the Rural Urban Continuum Codes, all based upon the 2010 US Census data, as well as our knowledge and experience with rural counties in Kentucky.

Objective 4: Expose pre-clinical medical students to rural practice and community medicine

PREMATRICULATION PROGRAM

The summer Prematriculation Program is a three-week program designed to provide academic, clinical and community medicine exposure to students prior to the start of their first year of medical school at U of L.

Class of 2022, 2023 and 2025

Prematriculation students spend about ten hours per week in classroom activities including medical case studies, research, and discussions about health care needs in rural communities. Students are assigned to physician preceptors for shadowing opportunities for approximately fifteen hours per week in various settings, including small rural clinics, hospitals, and nursing home facilities.

Students spend approximately fifteen hours per week assessing the health care provided in an assigned rural practice. A recent focus on health literacy assessment and patient motivation to change health habits has been added.

This program provides clinical exposure as well as a framework for students to evaluate their future medical practice before beginning their M-1 academic year (3). Participating students gain the experience of beginning to think like practicing clinicians, as well as develop relationships with some of their classmates before medical school begins.

PRECLINICAL PROGRAM

To date, the summer Prematriculation program and Preclinical programs have allowed 360 M-1 and M-2 students to get an introduction to rural practice. At the point of the last published report, 90% of these students who had entered residencies chose primary care. In addition, since 1999 these students have completed a rural community assessment as part of their summer activities. The 3-week summer Preclinical Program is an opportunity for U of L medical students to gain clinical experience as well as learn to assess a rural site as a future practice opportunity prior to entering their M-2 academic year.

Students are involved in classroom activities that begin to prepare them for the clinical setting. This curriculum is hands-on training that teaches the students various clinical skills and the details of the physical examination. Physician preceptors provide shadowing

opportunities. A focus on providing free school physical exams in the community has become the central learning laboratory for the program.

Preclinical Group Activities

Overview of Patient Evaluation
Well Baby Exam
Video Otoscopy
Heart and Breath Sounds
The Pelvic Exam
Breast Exam
Prostate/Rectal Exam
Suturing Lab
Sports Physical Exam

Objective 5: Provide a Rural Medicine Elective for students in the Louisville Medical Center.

RURAL MEDICINE ELECTIVE

The Rural Medicine Elective is a one credit-hour (16 contact hours) course offered by the University of Louisville School of Medicine for M-1 and M-2 students. Dr. Bill Crump is the course director, and the goal of this elective is to provide regular exposure to issues of rural practice while the students are in an urban environment. Occasional site visits to a rural practice sometimes replace the on-campus sessions. Topics discussed include the future of Medicaid, school-based clinics, residency training options to prepare for rural practice and detailed practice assessments, women's health in rural practice, making a rural practice financially successful, working with rural health departments, balancing personal and professional life, mental health care issues, working with nurse practitioners and physician assistants, children's health care, physicians as leaders in rural areas, the future of rural hospitals, rural scholarship and loan forgiveness options, and how to find and what to look for in a rural practice. Since 2000, 112 students have completed the M-2 elective. This curriculum option was also made available for first year medical students in 2002, and includes a day during spring break for the M-1s to visit Madisonville, tour the campus, and meet with rural docs. So far, 188 M-1s have completed this elective.

At the beginning and end of the nine-month course, a survey of attitudes and knowledge provides insight into the students' understanding of rural practice. Overall, students showed favorable impressions about physicians' practice in a rural area. Students believe that physicians in rural areas have the ability to make a positive impact in their communities both in health care and social leadership.

For the outdoor enthusiast, some of Kentucky's finest state parks are within an hour's drive, and Land Between the Lakes to the west offers 300 miles of undeveloped shoreline, with outstanding hunting, fishing, and hiking (www.lbl.org). (photo by Pam Carter)

Objective 6: Provide M-3 and M-4 clinical training.

TROVER CAMPUS M-3 AND M-4 ACADEMIC YEARS

The Trover Campus provides a small group of medical students the opportunity to complete their third and fourth years of medical school in Madisonville. After completing their first two years of basic sciences in Louisville, Trover Campus medical students move to Madisonville and complete all their clinical rotations there. Students are based within a rural integrated health system with a large tertiary care hospital (Baptist Health Deaconess Madisonville) providing open-heart surgery and most other services but can be in a truly rural setting with a 10 minute drive in any direction. Students participate virtually in the same classroom lectures as the Louisville campus students. Clinical rotations on the Trover Campus provide the unique opportunity for one-on-one learning with an experienced clinician preceptor. The typical teaching group on rounds in an urban medical center is one faculty, 3-5 residents and fellows, and 4-6 medical students. At the Trover Campus, the typical group is one student per faculty, sometimes with a Family Medicine resident on the teaching service as well. The Trover students also experience the value of small group learning by participating in problem-based learning sessions twice a month, facilitated by the Trover Campus Associate Dean, a family physician.

Students indicate their interest in placement at the Trover Campus, apply, visit the campus, and are interviewed. The selection committee ranks the candidates and offers are made to the selected students. This process has drawn national attention, with publication of the Trover experience in premier peer-reviewed Journals (4,5).

Program Outcomes

The goal is for the quality of the Trover Campus M-3/M-4 medical training to meet or exceed the quality of the training available at the downtown Louisville campus. The curriculum, learning materials, evaluations, examinations, and grading system for the Trover Campus are identical to those used on-campus. In terms of quantity, patient logs kept by Trover Campus students reveal that they see 2-4 times as many patients on most rotations as their on-campus colleagues, and record 2-10 times as many procedures. One measure of quality is the "paper and pencil" measure of National Board Examinations. On Step Two of the USMLE (United States Medical Licensing Exam), taken during the M-4 (last clinical year) of medical school, first time pass rates of Trover Campus students are comparable to those on campus. This campus has become a model for other newly developing regional campuses and the experience with the first 10 years was reported in the premier medical education journal Academic Medicine (4).

Another pertinent measure of Trover Campus quality is the perception of how these graduates perform in subsequent residency training. The residency program directors of the programs having Trover Campus graduates are surveyed each year concerning their evaluation of Trover Campus graduates' performance. The summary reveals that the Trover Campus graduates show better scores when compared with non-Trover Campus graduates. The Directors note that the Trover Campus graduates are especially well-prepared in the categories of interview skills, oral presentations, overall patient management, clinical judgment, self-directed learning, and interactions with patients. Most Trover Campus graduates report that they matched to their first choice residency program.

Objective 7: Place Trover Campus graduates in specialties in proportions to meet Kentucky's needs (50% FM, 75% Primary Care, 90% Generalist - including General Surgery and Psychiatry).

Through 2022, 68 of 162 graduates (42%) have entered Family Medicine, 21 of 162 (13%) have entered OB/Gyn, 16 of 162 (10%) have entered Pediatrics, Internal Medicine or Med/Peds and 12 of 162 (7%) entered Surgery. This summarizes as 123 of 162 (76%) entering primary care residencies and 145 of 162 (90%) becoming Generalists (includes General Surgery and Psychiatry).

L-R: Class of 2021 graduates: Rohit Nair, Paige Hart, Anne-Taylor Beck, Leeandra Cleaver, Katlyn Clark-Fuqua, Josh Fuqua

Residencies Matched by Trover Campus Graduates

N = 162

Family Medicine (42%)	OB/GYN (13%)	Pediatrics (9.9%)
BHDM FM Residency	**Mountain AHEC**	**Brody SOM**
Madisonville, KY (18)	*Asheville, NC (2)*	*Greenville, NC*
Southern Illinois University (2)	**Brody SOM**	**Indiana University**
Carbondale, IL	*Greenville, NC (2)*	*Indianapolis, IN (2)*
Memorial Health	**Good Samaritan**	**Virginia Commonwealth Univ.**
Savannah, GA	*Cincinnati, OH (5)*	*Richmond, VA*
Anderson Medical Center	**University of Louisville**	**University of Missouri**
Anderson, SC	*Louisville, KY (2)*	*Columbia, MO*
University of Cincinnati	**University of Kentucky**	**Marshall University**
Cincinnati, OH	*Lexington, KY*	*Huntington, WV*
Cabarrus	**St Johns**	**University of Tennessee**
Concord, NC	*St. Louis, MO*	*Memphis, TN (2)*
St. Mary's	**Wake Forest**	**University of Louisville**
Evansville, IN	*Winston-Salem, NC*	*Louisville, KY (3)*
East Tennessee State	**University of Tennessee**	**Vanderbilt University**
Johnson City, TN (3)	*Knoxville, TN*	*Nashville, TN (2)*
St. Elizabeth	**Geisinger Health System**	**East TN State University**
Edgewood, Ky (4)	*Danville, PA*	*Johnson City, TN*
Greenville Hospital	**Mercy Hospital**	**St. Vincent Hospital**
Greenville, SC	*St. Louis, MO*	*Indianapolis, IN*
Dartmouth	**Memorial Health Univ. Med Center**	**Nemours Childrens Hospital**
Concord, NH	*Savannah, GA*	*Orlando, FL*
Univesity of Louisville Glasgow	**St. Vincent Hospital Center**	**Med/Peds (3.1%)**
Glasgow, KY	*Indianapolis, IN*	**Medical University of SC**
Self Regional	**University Hospital**	*Charleston, SC*
Greenwood, SC	*Columbia, MO*	**University of Kentucky**
University of Louisville	**University of Tennessee**	*Lexington, KY*
Louisville, KY (5)	*Memphis, TN*	**University Cincinnati Hospital**
Phoebe Putney Hospital	**Medicine (11.1%)**	*Cincinnati, OH*
Albany, GA	**Good Samaritan**	**University of Louisville**
University of Wisconsin	*Cincinnati, OH*	*Louisville, KY*
Baraboo, WI	**University of Louisville**	**UC San Diego Med Center**
Ft. Wayne Medical Education	*Louisville, KY (5)*	*San Diego, CA*
Ft. Wayne, IN	**Keesler AFB Hospital**	**Surgery (7.4%)**
Florida State University	*Biloxi, MS*	**University of Louisville**
Ft. Myers, FL	**West Virginia SOM**	*Louisville, KY (2)*
UPMC Medical Education	*Morgantown, WV*	**Good Samaritan**
Pittsburgh, PA	**Mayo School of Graduate Medicine**	*Cincinnati, OH (2)*
McLennan County FM	*Jacksonville, FL*	**University of Kentucky**
Waco, TX	**University of Kentucky**	*Lexington, KY*
Deaconess Hospital	*Lexington, KY (3)*	**Banner Good Samaritan**
Evansville, IN (3)	**Ohio State University**	*Phoenix, AZ*
Wright State University	Columbus, OH	**University of Arkansas**
Dayton, OH	**Loyola Univ. Medical Center**	Little Rock, AR
John Peter Smith Hospital	Maywood, IL	**University of Indiana**
Ft. Worth, TX	**University of Cincinnati Medical Center**	*Indianapolis, IN*
Mountain AHEC	*Cincinnati, OH*	**University of South Florida**
Asheville, NC	**University of Alabama Medical Center**	*Tampa, FL*
University of Kentucky	*Birmingham, AL*	***University of Tennessee***
Lexington, KY (2)	**Marshall University SOM**	*Chattanooga, TN*
Tacoma Family Medicine	*Huntington, WV*	**Memorial Health - Univ. Med Center**
Tacoma , WA	**Duke University Medical Center**	*Savannah, GA*
Honor Health	*Durham, NC*	**UCLA**
Scottsdale, AZ	**Anesthesiology (3.1%)**	*Los Angeles, CA*
Marshall University	**University of Louisville**	**Psychiatry (3.1%)**
Huntington, WV	*Louisville, KY*	**Penn State**
Ball Memorial Hospital	**University of Texas SW**	*Hershey, PA*
Muncie, IN	*Dallas, TX*	**East TN State University**
UT St. Thomas Hospitals (4)	**University of Tennessee**	*Johnson City, TN*
Murfreesboro, TN	*Knoxville, TN*	**Memorial Health**
Tallahasee Memorial Hospital	**Univ. of Alabama Medical Center**	*Savannah, GA*
Tallahassee, FL	*Birmingham, AL*	**Pine Rest Christian Mental HS**
Lake Cumberland Hospital	**University Hospitals**	*Grand Rapids, MI*
Somerset, KY	*Jackson, MS*	**University of Florida**
Spartanburg Regional Healthcare	**Dermatology (2.5%)**	*Gainesville, FL*
Spartanburg, SC	**Southern Illinois University**	**Diagnostic Radiology (.6%)**
Pathology (1.2%)	*Springfield, IL*	***University of Louisville***
University of South Alabama	**East Carolina University**	*Louisville, KY*
Mobile, AL	*Greenville, NC*	**Emergency Medicine (.6%)**
Virginia Commonwealth Univ.	**University of Vermont**	**GR Education/Research**
Richmond, VA	*Burlington, VT*	*Grand Rapids, MI*
Orthopedics (.6%)	**University of Missouri**	**Physical Medicine & Rehab (.6%)**
Southern Illinois University	*Columbia, MO*	**Albany Medical Center**
Springfield, IL		*Albany, NY*
Child Neurology (.6%)		**Urology (.6%)**
LSU School of Medicine		**University of Louisville**
New Orleans, LA		*Louisville, KY*

*Percentages show the proportion of Trover Campus graduates who chose that specialty.

***Objective 8: Provide each of the Trover Campus teaching departments an opportunity to have at least 8 student rotations per year, with compensation to the teaching faculty*.**

Recruiting and then retaining physicians for a large multi-specialty group in a town of 20,000 is a challenge. Ideally, the Baptist Health Madisonville organization recruits those who are comfortable living in a small town and share a common culture with western Kentuckians. When sometimes only two physicians in a specialty must share all call, it takes someone special to stay with such a group. From the beginning, Trover Health System had placed a very high value on teaching, and the funding for the Trover Campus has allowed a reasonable reward for those clinician teachers who accept responsibility for assuring adequate exposure for required clerkships. The Baptist Health system has continued this focus on education in Madisonville. The faculty has taken this responsibility seriously, and the Trover Campus activities are viewed as a positive for recruiting and retaining clinician faculty for Madisonville. An innovative teaching skills process for faculty has been instituted and published in the Journal of Kentucky Medical Association.

Objective 9: Place at least 50% of graduates into practice in small Kentucky towns.

The purpose of the Trover Campus is:

> ***By providing first-class medical education in a small Kentucky town,***
> ***place more graduating medical students in practice in small Kentucky towns.***

Nationally, 5% of medical students report plans for rural practice. The five oldest rural programs in the U.S. report that about 50% of their graduates are in rural practice. Of the ULTC graduates in established practice, 51% initially chose rural practice. Of those from rural Kentucky, 48% are now in rural Kentucky practice.

Publications

(1)Crump WJ, Fricker RS, Flick, KF, Gerwe-Wickham K, Greenwell, K, Willen KL. A Rural Pathways Program for High School Students: Reinforcing a Sense of Place. Family Medicine. 2014; 46(9): 713-717.

(2)Whittington CP, Crump WJ, Fricker, RS. An invitation to walk a mile in their shoes: a rural immersion experience for college pre-medical students. Journal of Regional Medical School Campuses. 2019;1(5). doi:10.24926/jrmc.v1i5.1565.

(3)Crump WJ, Fricker, RS. A Medical School Prematriculation Program for Rural Students: Staying Connected With Place, Cultivating a Special Connection With People. Teaching and Learning in Medicine. 2015; 27(4): 422-430.

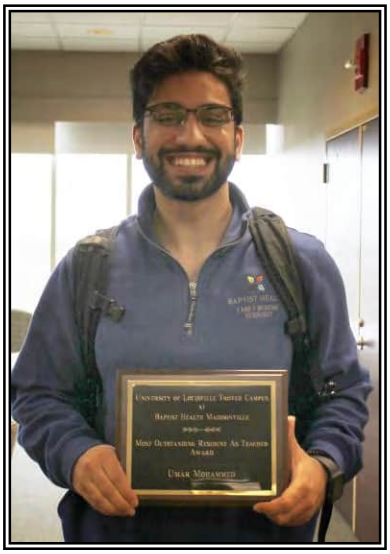
(4)Crump WJ, Fricker RS, Ziegler C, Wiegman DL, Rowland ML. Rural Track Training Based at a Small Regional Campus: Equivalency of Training, Residency Choice, and Practice Location of Graduates. Academic Medicine. 2013; 88(8): 112-1128
.
(5)Crump WJ, Fricker RS, Ziegler CH, Wiegman DL. Increasing the Rural Physician Workforce: A Potential Role for Small Rural Medical School Campuses. The Journal of Rural Health. 2016; 32(3):254-259.

University of Louisville Trover Campus Graduates' Kentucky Practice Locations

Kentucky Practice Locations				
Albany	Edgewood (2)	Hazard	Madisonville (6)	Paducah (5)
Annville	Florence	Henderson (2)	Morehead	Pikeville
Benton	Frankfort	Hopkinsville (2)	Mt. Vernon	Princeton
Berea (2)	Georgetown	Leitchfield	Murray (6)	Walton
Bowling Green (2)	Greensburg	Lexington (6)	Nortonville	Whitesburg
Cadiz	Grethel	London	Olive Hill	Winchester
Calvert City	Harold	Louisville (11)	Owensboro (5)	

Awards

Dr. Sarah Fisher was awarded the "Couldn't have done it without you" award for both 2021 and 2022 by the ULTC students



Dr. Umar Mohammad was awarded the "Best Resident Teacher" award for 2021 by the ULTC students

Dr. Reagan Gilley was awarded the "Golden Apple" teaching award for 2022 by the ULTC students

Dr. Hassan Mohammad was awarded the "Best Resident Teacher" award for 2022 by the ULTC students

Reflections…..

Clinical students are encouraged to write reflective essays putting their experiences into perspective. We share some of these here.

Devin Clark

Ms. “Jean Smith” (not her real name), a 60-year-old woman I had the pleasure of working with towards the end of my third year, was a retired schoolteacher recently diagnosed with metastatic pancreatic cancer. She first noticed her symptoms while performing chores around the house in spring of 2021. She remembers being severely fatigued with the simplest of errands and recalls frequent bouts of stomach pain. Eventually, her symptoms resulted in a trip to the local urgent care. Jean underwent a CT scan of her abdomen and was instructed to follow up with a GI specialist. There, the diagnosis was revealed to her and the prognosis discussed.

Jean was initially devastated. She was in total disbelief and didn’t understand how this could happen to her (a healthy 60-year-old who exercised daily and had a healthy diet). The only mark against her was the nasty habit of smoking cigarettes she had picked up as a teenager. Luckily, the patient had overwhelming support from her husband and two girls. She was also cheered on by friends, neighbors, and former coworkers. Jean began chemotherapy 1-2 weeks after her initial diagnosis. She lost her hair, her energy, and struggled to complete her daily routines. Her mood began to change which was first noticed by her husband. Jean had become more tearful, anxious and pessimistic about her future. These observations were eventually brought it up to her oncologist, who encouraged a referral to palliative care to help Jean manage some of her through treatment not offered by their office. Ms. Smith agreed.

At Jean’s first palliative care meeting, she was stunned by the format of the appointment. Jean entered the conference room where her family, along with the physician, the nurse, the social worker and the chaplain were seated. Jean was positioned at the head of the conference table. The meeting began with a brief overview of palliative care, led by Jessica, one of the social workers. It was explained to Jean that the goal of palliative care was to ease her symptoms and help relieve physical and emotional burden. In addition, palliative care was there to aid her navigate uncharted territories, including the unfamiliar medical field, her diagnosis, and her life moving forward. Eventually the palliative care team began asking Jean questions, including: where she was born (Kentucky), activities she had neglected but wanted to get back to (making soup for her family and doing chores like laundry), and ideas/beliefs she held near/dear to her heart.

After the initial visit the patient remained in close contact with each member of the palliative care team. She had monthly visits with her physician to review her medications and ensure that her pain was adequately controlled. In addition, the doctor also addressed any new medical issues and provided appropriate treatment. The social worker checked in with the patient a few times a week to ensure that she had access to all the resources she needed to accomplish her daily tasks. She also worked with the patient to formulate goals and direct her to support groups and websites for pancreatic cancer. Finally, the chaplain (an incredibly positive presence during the interactions) offered spiritual resources and assessed Jean’s outlook on life and her thoughts on death. He also went some thoughts on potential bumps and strains that the patient could experience regarding her marriage.

Overall, I was very impressed with the care provided by the palliative care team with each delivering a separate assessment and plan for the patient and contributed to the goals of the group. The team was also extremely inviting/approachable and sought input from the patient's family members. For instance, they asked the daughters what Jean's favorite activities were. When asked, the girls mentioned that their mom loved fishing. The team quickly responded with a planned family fishing trip to the local state park. The team also sensed Jean's fear of losing her independence and anxiety about her future and the upcoming changes in her life. Rather than question her directly, the team gathered input from other family members. Jean's husband was able to step in and articulate/identify the most profound changes in the patient's mood/behavior. In addition, he was able to list some of his favorite shared activities that had been disrupted by his wife's diagnosis.

Another aspect of palliative care is the personalized tailor-made plan constructed for each patient. There were multiple instances where the palliative team members pushed Jean to go outside her comfort zone, rather than put off events. On one occasion, Jean was considering skipping out on a school board related function to devote more time to her immediate family and dealing with her diagnosis. Jean discussed her thoughts on this with her social worker who quickly insisted that she go to the event because of its significance to her. On the flip side, the social worker also counseled Jean about her anxiety caused by an inability to hang out with friends. Jean noticed that the pain medications along with worsening fatigue, made it difficult to meet with all her former acquaintances daily, which increased her anxiety. The palliative care team consoled her and explained that while some events, like the aforementioned school function, are still important to attend, other events like routine social meetings with friends may need to be postponed due to the physical toll of the drugs and cancer. This helped alleviate some of Jean's anxiety.

Discussing Ms. Smith's palliative care experience was enlightening. It's a relief to know that no matter what a patient's diagnosis, prognosis, or support system is, they have access to resources to better adapt and handle their situation. From a professional standpoint, it was refreshing to see so many disciplines come together to accomplish common goals. I especially liked the holistic approach seen in palliative care and I loved that all aspects of the patient's health: a) physical, b) mental, c) emotional, and d) spiritual were addressed. Having constant input from other friends/family was also beneficial to patient outcomes. I frequently see people struggle to manage their problems solely on their own.

Professionally, there were plenty of learning points from this palliative care case. First and foremost, I was refreshed on the precise definitions of palliative care, hospice care, and comfort care, along with the consultation process involved for each. I learned that pain/symptom control is just a small sliver of the services provided by the team. For Jean, the most valuable aspect of her palliative care team was the constant support and assistance with overcoming obstacles encountered when navigating the healthcare system. Moving forward with my medical career, I'll be sure to incorporate more holistic questioning and services. I'll ask more about family members, encourage input from spouses/children, explore patient's cultural and spiritual beliefs, and dive deeper into patient's internal motivations.

Micah Kaiser

Mr. Frank (not his real name) is a 43 year-old gentleman who was admitted to the Behavioral Health Unit for alcohol intoxication and suicidal ideation. He stated that he had been "clean" two times previously, once for 6 years and another time for 11 years; and that he ultimately wanted to try rehab again. He stated this episode of binge drinking had only lasted a couple weeks; unfortunately, he had severe withdrawals and had to be transferred to the Critical Care Unit. While speaking with him one day in the CCU and probing his suicidal ideation, he opened up to me. He said that he began drinking over 20 years ago after his young daughter had died in a car accident. One that had been entirely his fault. He explained that he and his spouse at the time were fighting vehemently in the car while she drove them home one rainy night—escalating to yelling, screaming, and her slapping his chest. He responded instinctively by trying to grab the steering wheel to pull the car off to the side of the road. His wife lost control and they spun into an oncoming 18-wheeler—killing his daughter. His marriage broke down shortly after that, as did he.

As Mr. Frank told me the story, tears welled up in his eyes that ultimately led to wracking sobs. The pain and grief was as fresh today as it was 20 years ago. He still could not come to grips with the vast and shattering guilt from being responsible for the death of his daughter. It haunted him. Anytime he felt happiness, it would immediately be swallowed by a feeling of guilt due to his daughter not being alive due to his actions. He felt unworthy of joy; in a sense, he felt irredeemable. And so he punished and numbed himself with alcohol. Even as he was about to return to rehab he expressed that he was unsure if he would maintain his sobriety. that he had done an unforgiveable act, one that he could not move on from nor accept. Ultimately, he was in the hospital for 2-weeks, and I spent a lot of time speaking and listening to him. At the time of his discharge, I shook his hand, wished him the best, and wondered if he would one day return again; still plagued by his inescapable regret.

Throughout my numerous encounters with Mr. Frank, I was continually struck by the gravity of how one moment had fractured this man's entire life. Not only that, but it had essentially frozen him in time. He was utterly unable to move past the moment his daughter died 20 years ago, his life remained mired in that one unforgiveable act. And I realized that he never would move on, not until he figured out how to accept it. To be honest, I am not sure that he will ever come to acceptance—he has spent the majority of his life carrying a weight that he feels he utterly deserves.

The encounter caused to me to be introspective about how much regret sometimes plays a role in my life. As medical students, we are used to holding ourselves to very high standards, and beating ourselves up when we don't reach them. However, this gentleman taught me first-hand how paralyzing regret can be, and how little I should let it take hold in my own life. I remember the intense sadness I continually felt in talking to Mr. Frank. He was a nice guy, but he had never experienced any growth or moved forward past this moment. He taught me that regretting the past can sometimes prevent you from improving the future.

Mr. Frank taught me several things that will make me a better physician. One is empathy for every patient I meet. Everyone has a story and a reason for the way they ended up, and trying to understand that story is critical to being a good healer. Second, live life forward, not backwards. It is incredibly easy to be frustrated and be mired down by "what-ifs"; however, being fixated on the past doesn't allow for future growth unless you accept and learn from your mistakes.

Being a good physician should be a process of continual growth. Lastly, I gained greater appreciation and gratitude for all the opportunities I have been afforded. It is truly a privilege to study medicine and to be able to have these meaningful encounters with patients, it is not a privilege I feel that I should take lightly.

Alyssa Hounshell

When I first met Joe (not his real name) he was lying down, his blankets pulled up tightly to cover his face. Taking in this scene, I stepped across the threshold from the bright hallway into his dark room. I reflected back on the notes from his admission I had just been reading. He had been moved involuntarily from the ED to the Behavioral Health Unit after he told the emergency department staff he was going to "blow his head off." I greeted him and asked politely if I could ask him a few questions. He huffed in agreement. As I began asking what had brought him to the BHU, he informed me that all of the information I needed should be in his chart already. Had I even looked at it before I had barged in and interrupted his sleep? Was I stupid or just plain rude? My cheeks reddening under my mask, I assured him that I understood how he felt. "I doubt it," he scoffed, "no one understands the pain I'm going through right now." As the conversation went on, he continually expressed that no one cared for him or listened to him. He lamented that, had he known he would have been placed on an involuntary psychiatric hold, he would have just bought some pain pills from John Doe down the street and never would have come to the hospital in the first place. He repeatedly complained of being "locked up," and rolled his eyes at every empathetic statement I made. With each minute of the agonizing conversation I felt myself shrinking. Maybe if I was lucky, I would disappear altogether. Getting nowhere, I thanked him for his time and left before I agitated him any further. The laid-back introduction I had planned had been turned into what felt like an attack.

Later I would go to let him know that the doctor was ready to see him in the conference room. "You mean I have to walk to him?" he grumbled. I nodded. "Do you need some help sir?" I asked as he slowly stood on unsteady feet. "No I don't need help. Nobody has helped me the whole time I've been here," he spat. I gritted my teeth as he continued to complain as we walked down the hall. My body felt hot and cold all at once. Anger bubbled and then sank like a rock in the pit of my stomach. I felt a pang of guilt, and then shame for how I felt. In medical school we had been taught to believe that we would spread joy and love and fix everyone. It would all be sunshine and rainbows. As I entered the conference room filled with dread, Joe sat in his chair as the psychiatrist greeted him. He hunched over, curling his body in on himself, somehow making himself even less approachable. He didn't say a word for a long time. I watched as he clenched his jaw in protest to the onslaught of questions from the doctor. Seconds seemed like hours as we all sat silently awaiting his reply. When he finally spoke, it was clear he was annoyed about having his brain prodded when he felt our goals were much different than his own. "How was your childhood then? Are you perfect?" He hurled his words at the doctor like weapons. I wondered if this is how he talked to everyone. After what seemed like an eternity, the doctor told him he was free to leave, and he slowly rose and staggered back down the hall, muttering profanities with each shaky step. The room collectively let out a sigh of relief, and we were excused for the weekend.

When I arrived on Monday morning, I opened Joe's chart, expecting to see reports that he was guarded and uncooperative throughout the weekend. To my surprise, every note indicated that he had been pleasant. Over the weekend, his KASPER report had come back and it turned out his story about simply not being able to contact his pain management clinic was true. I felt guilt wash over me. I had absolutely pegged this man as a drug seeker, and it turned out he had been truthful throughout his entire stay. He had run out of his pain medication and truly couldn't get an appointment to get them refilled. He had laid at home in pain for a week

before he finally arrived in the ER. Hurting so badly that he wished he would just die, he threatened to shoot himself and finally ended up here on the behavioral health unit. I closed the EMR, logged out of the computer and headed to his room. Before I got a chance, I caught a glimpse of him sitting at the end of the hallway, staring out the common room's only window. Early morning sunlight washed over him. In his white shirt and light khaki shorts, it almost looked as if he was glowing. He looked so serene that it seemed impossible that this was the same man who had been so rude to me on Friday. As I approached him, he turned his head to look at me and for the first time, I noticed that his eyes were a rich chocolate brown. "Good morning!" I said, "how are you feeling today?" "Much better," he said with a smile. The wrinkles extending from the corners of his eyes were clues that he had smiled often. His face was kind, cheerful even. I finished my conversation with him and walked over to meet my attending in the conference room. Our first task of the morning was to call and set up a follow-up appointment for Joe at his pain clinic. We called several times and received no answer. We texted the number provided, still with no luck. Finally, my attending decided he would just walk over to the clinic building across the parking lot so they couldn't ignore him any longer. Eventually they did return our call and we got the appointment set up. I went back to find Joe to give him the update, and I told him all about the ordeal. "It looks like you all got a taste of what I was dealing with," he laughed. We talked for a few more minutes, and I wished him well as I said goodbye to him for the last time before he was discharged.

Joe was the first patient to push me to the point of anger. He was the first patient I saw who made me feel like a nuisance, the first to yell at me, and the first to refuse my help. As much as I struggled having Joe as my patient, he taught me perhaps the most important lesson a medical student can learn. We see patients at their worst. We see the messy, ugly, raw reality of pain and suffering. Often, we see patients who have fallen through the cracks. His behavior was not an indication that he was a bad person. Instead, it was a cry for help from a man in misery. Joe may have been the first patient to make me angry, but he was also the first patient to make me feel truly fulfilled. I hope I never forget him.

Talitha Jones MS4 Care That Doesn't End In A Cure

As a medical student, there is a day we all dread, the day one of our patients' lives ends. For some, this comes early in their career, others a bit later. Sometimes we are notified simply by seeing the patient's name removed from our patient list the next day, other times, end-of-life is a journey we take with the patient. One journey I took was with a patient receiving palliative care due to pancreatic cancer. The man was relatively young, only 60 years old, married, and had kids about my age and grandchildren. I met this patient on my first day of my third-year internal medicine rotation, but this experience will always stay with me. He was extremely sick and had been suffering for several months. In the last few weeks, his vitals had taken a turn for the worst, and the end was near. I saw first-hand as we began shifting our patient care goals from an emphasis on bettering outcomes and chasing lab values to providing comfort for the patient and his family. At first, our conversations had a very medical tone. We went over the status of each of his failing systems. We explained how we were managing each, but, in the end, we backed off this kind of discussion and instead transitioned to pain control and discussing realistic plans with the family and supporting them during this trying time.

Each day, our team tried to view this situation not as if there was nothing left we could do but instead, how can we could best support this transition. We spoke to the family often and learned the patient and his family were devout Christians. One service we provided was an opportunity to speak with the Chaplin daily. This was a huge comfort to the family and made them feel supported spiritually in a way we, as healthcare providers,

couldn't. Another hurdle we had to address was that the hospital's current rules only allowed one family member in the ICU. This was extremely difficult on the patient's grown children, who wanted to be with their father in his last days. They also desperately wanted their young children to see their Papaw one last time. As a team, we decided to keep them updated by calling them daily when we came by to see the patient and allowing his wife to facetime the other family members while we were there. On what we believed to be the final day, we were also able to enable the family to use an iPad and Facetime the family for goodbyes. The nurses coordinated this, and each gave special attention and care to this family. We, as staff, were in the room with the wife, so she knew she was not alone physically as well. Lastly, we allowed the patient's wife to decorate the patient's room with family pictures and brought blankets from home so the room would feel homier. Overall, I felt the entire care team, the nurses, physicians, medical students, social workers, and Chaplin all played their roles well to help facilitate this challenging care.

If I were to change anything about this patient's care, I wish we would have been able to address some of the family's end-of-life discussions sooner so that the patient could have been more coherent. Though the prognosis was never good, the family held off as long as they could to discuss what his final days would look like despite ample counseling. I wonder if we had been more direct with the family about how the pressure of many decisions can weigh heavily during the final days and how the covid regulations were not changing, may have better prepared them. Though difficult to think about early on, it could eliminate stress later when everyone is more fragile. This is also a challenge because, as physicians, it is impossible to know precisely when a patient might take a turn for the worst. Despite this, the team did an excellent job of keeping the care patient-oriented and always reminding everyone that we want to do what is in the patient's best interest and would be what he would have wanted. This helped the family navigate difficult decisions. I was happy to see the care team act as guardrails in those conversations and even mediators between family members.

We were fortunate to have an incredible interdisciplinary team. The Chaplin, nurses and social workers were all involved and communicated efficiently and gracefully. They had each other's phone numbers and knew to respond quickly as this situation could need immediate action. One strength I saw was that the staff continued care beyond the patient's life by setting the wife up with a support group and following up with the family.

This experience was my first as a member of an in end-of-life care team. I remember his final days were filled with so much discussion and emotion, but in the end, it is all very quiet and peaceful. I will never forget how anticlimactic I found death to be. I was touched by how every member of the team showed their humanism and went above and beyond their duty to support and care for this family, even if it meant a big wig physician helping tape up posters with pictures of the grandkids because he knew how important it was to the family. This is the kind of provider I want to be. I don't want to stop at simply providing medical care but want to treat my patients and their families holistically, caring for them mentally and spiritually. I want to always connect with my human side that reminds me no matter how many times I have seen death that this is still so hard for the family and go out of my way to provide comfort where I can. I initially thought palliative care was an easy form of medicine because I didn't know what could be done medically. However, I learned that nothing in end of life care is easy. Though the focus may shift from physical healing, to other forms of care such as spiritual, social, and mental support they are still very challenging and necessary.

Publications by ULTC Students:

MY PARENTS, MY HEROES

AUTHOR **Katie Wilmes, MS3**

Merriam-Webster defines a hero as 1.) a person who is admired for great or brave acts or fine qualities, 2.) a person who is greatly admired. This word was once reserved for the superhero characters of comic books and the courageous warriors of our country. However, today, the word "hero" is displayed in shop windows, on yard signs and scattered throughout the news describing everyday humans doing extraordinary acts of service.

The selfless and heroic nature of many individuals stood out during the unprecedented times of the COVID-19 pandemic. This pandemic shined a light on the acts of bravery made by health care workers, schoolteachers, parents, caretakers and essential workers who were creative and determined to continue some form of normalcy in a time of adversity. In addition, parents became the forefront of the praise and admiration for balancing childcare and homeschooling on top of managing to work from home. While most children already considered their parents as heroes, the praise from the community was long overdue.

In my short few years of adulthood, I have grown to appreciate my parents not only for providing for my basic needs during childhood, but also for their compassion, wisdom and guidance. My parents allowed me to travel from a young age and encouraged me to always try my best. As a child, I watched their every move, they instilled in me a strong work ethic, motivation for problem solving and a desire to be philanthropic. I know they would have cheered me on in any career, but they have been my biggest supporters through medical school.

My dad, Mark, worked his way through college as a non-traditional student. After graduation, he began working for the US Army Corps of Engineers and is currently approaching 34 years of service. With several moves halfway across the country, he has worked his way up from a park ranger to deputy chief of operations. During his career, he spent several years working in support of FEMA for disaster relief. He responded to several natural disasters including Hurricane Georges (Puerto Rico), the Northridge Earthquake (California), Hurricane Francis (Florida) and Super Typhoon Pongsona (Guam). In responding to these disasters, he supervised the blue roof missions, debris removal, damage surveys and building inspections.

He also held a Red Card, the Incident Qualification Card, which certified him as a wildland firefighter for several years. He was honored to serve as the national chairperson of The Operations Project Manager Community of Practice Advisory Board for two years. I truly believe my dad's commitment to serving others and taking on leadership roles through his career influenced my passion to pursue a career through which I could make an impact on people's lives. Undoubtedly, seeing the reward he got from speeding to catastrophes, to helping others during times of crisis, sparked my passion for emergency medicine. Although in a very different manner, I want to be able to step in during those moments of fear and panic and be able to offer a helping hand, just as he has for so many.

My mom, Teresa, is a registered nurse and opened my eyes to the rewarding aspects of serving others through health care. Over her 34 years as a nurse, she has transitioned from the Mayo Clinic Hospital, Saint Marys Campus to a small homecare agency in Western Kentucky to working for a family medicine practice in Durham, North Carolina, with a few more stops along the way. Now that I am part of the health care team, I have so much appreciation for the sacrifices my mom made to have a strong family, while challenging herself to establish an impressive resume throughout her career. However, the most outstanding part is that I was able to be a witness to the compassion that she shows patients.

My mother stepped in to care for my grandpa while he was under hospice care at home. One day, her quick thinking saved him a trip to an urgent care when he fell due to an uneven sidewalk, she sprang into action and carefully helped him up. While he was embarrassed and denied any pain, she reassured him and quickly accessed his skin which was covered in skin tears. Thankfully, she keeps her nursing bag in the car and was able to quickly clean and bandage his wounds so he could continue to enjoy one of his last days out of the house. I have always admired her willingness to step in and her savvy ability to help others during a crisis. I want to grow up to be like her, to feel confident, calm and act swiftly whenever trouble hits.

While some people might envision a hero with a costume and cape, I have realized the world is filled with heroes. They are everyday people carrying out acts of bravery which take courage and determination. I think it is easy to understand why our vocabulary has been saturated with the word "hero" recently, but really, these heroes have been here all along. ⚜

Katie Wilmes is a third-year medical student at the University of Louisville School of Medicine in the Trover Track.

BY TANNER SMITH, ULSOM M-1

JUST DO SOMETHING

If I were to ask you the significance of December 10th, 2021, in your life you probably would not be able to recall very much of it. Besides birthdays, anniversaries, promotions or some chance memorable event, this was just another Friday in the calendar. Unfortunately, this date is infamous for a particular part of the United States, which happens to be largely located in the state of my medical school, and specifically my hometown, Mayfield, Kentucky. An EF-4 tornado ripped through western Kentucky in one of the longest track twisters to date anywhere in the country. Living in Louisville to attend medical school, all I could do was watch and check in with family after it passed. Physically everyone in my family was safe, but others were not as fortunate.

It is difficult to understand damages of storms like these to a place if you've never been there previously, especially if you're just seeing them through a screen. The pictures and videos that surfaced in the subsequent hours were unlike anything I had seen. Buildings I had driven by growing up, shopped in or shared a meal in were demolished; I could feel this pain on another level. My immediate reaction was to go, but as developments broke, the place became flooded with rescue teams and locals searching for their loved ones. I desperately wanted to help but knew that the timing was not right.

With help from fellow University of Louisville School of Medicine students and faculty, we were preparing to send a team after our semester final exam to be the hands and feet of the recovery effort. I was moved at the willingness of students to give up part of their first weekend of Christmas break to help a place they most likely have never heard of before this storm. We had two groups of students take day trips to Mayfield to help in debris clean up and in the donation centers. From the big picture view of things, we did very little. But volunteerism is not about doing big things: it's the little things that matter, it is doing something that matters.

The most important thing is not the grandness of the gesture, it's simply the commitment to do something.

The best part about volunteering is that each person gets to take away the meaning to them. We always want to do so much more, so often instead of doing a little, we do nothing at all. This experience taught me that you make an impact on one person's life whether you know it or not, the time and energy are truly worth it. These students may not have felt like they did much on their trip, but they made an impact on my life that I will never forget. This opened my eyes about volunteerism in a way I never imagined. There are so many opportunities to help others if we seek them. And sometimes they just fall right in our lap.

Medical school curriculum consists of various clinical lectures that emphasize empathy and compassion. These lectures seem so abstract until experiences such as these reorient our thinking. I will carry these lessons with me during my medical school journey and beyond. Because of this experience in my hometown, I won't see the downtrodden or those affected by a natural disaster in the same way, and I won't be a bystander. I see them now as fellow humans that need a helping hand, and that hand is my very own. The most important thing is not the grandness of the gesture, it's simply the commitment to do something.

Tanner Smith is from Symsonia, Kentucky and completed his undergraduate degree at Harding University. He chose the Trover program because of his interest to one day practice medicine in a rural setting. In his free time, he enjoys travelling, exercising, and relaxing with his wife, Alex, and dog, Mila.

BY ELIZABETH C. LYONS, ULSOM M-1

Sometimes It Is Right In Front Of You

Front row (left to right): Elizabeth Lyons, Hannah Marshall, Bhavani Gudlavalleti, Claire Fell and Molly Fears. Back row (left to right), Shruti Wadhwa, Amna Zolj, Tanner Smith, Julianna Cobb, Danielle Graves, Tyce Riddle, Nathan Fielder, Ben Smith, Andrew Hey, Josh Hill, Meredith Hobbs, Kate Pierce and Alec Moore. Not pictured* Emily Major and Charlie Paul.

The morning of December 11th, hearing the news of the devastating tornadoes in Western Kentucky, the focus of several medical students at the University of Louisville School of Medicine (ULSOM) quickly shifted towards helping the areas impacted. "How can we help?" became the common question buzzing throughout each class. Plans were quickly put in place for collecting donations and the formation of groups to travel to various towns and assist in the start of long cleanup efforts. As future physicians, we will continuously be called to action and our response must be to step up and say yes. This standard was unquestionably met by ULSOM students to help Western Kentucky.

When I reflect on how my fellow classmates united behind these communities, I see a group of future physicians who will step up and answer the call to action without hesitation. For other first year medical students and myself, the night the tornadoes hit was the weekend before our first medical school final exam. But our priority was on collecting donations, checking in on classmates who were from those areas, and doing what we could to meet the needs of those hurting. What amazed me was the number of students who were a part of this effort who had no ties to Kentucky before they moved here for school. Many of the students had not even heard of some of the towns affected by the tornadoes, but quickly signed up to assist in any capacity they could. We are reminded that great physicians do not just treat, they care for their patients and community. During this experience, I was surrounded by classmates who did just that and put people in need above their own needs.

A career in medicine brings a responsibility of service to our communities branching far beyond a white coat and stethoscope. My first semester of medical school we attended small groups as part of our Introduction to Clinical Medicine course to learn the qualities of being well-rounded physicians. The lesson that resonated with me most powerfully was a panelist discussion on how we can begin to

help our communities even if there is so much to be done. A pediatrician on the panel shared her idea that the best way a physician can improve the challenges faced in our society is to focus on the patient who is right in front of us in that moment, doing the best we can to advocate and care for them. We can thus discover and focus on the daunting challenges encountered by our communities, one person at a time.

This idea is one that solidified in me when we traveled to Mayfield, KY to help. As we traveled through the town, buildings were unrecognizable, and destruction was seen all around. The amount of work to be done was overwhelming. Our group of several medical students was tasked to help with the removal of fallen trees near homes. Following several back-and-forth trips of tossing limbs onto a pile, I thought how we could do a lot more than simply moving trees. There was so much to be done, and it seemed as though what we were doing was just a drop in a bucket. However, after listening to the family we helped as they expressed how much less stress and worry they felt because of our help, my perspective completely changed. Before hearing that, I was focused on everything that had to be done, devaluing the task right in front of me. Through my eyes, tree removal did not feel as though I was making a difference, but to the family that no longer had a fallen tree in their yard, it made all the difference. Answering the call to action is being willing to do what needs to be done, big or small. This experience showed me the importance of focusing on the task in front of me to address challenges one by one. Whether in a clinical setting or serving the community, I will hold tight to this principle to assist, care, and advocate for the needs right in front me.

Elizabeth Lyons is from Danville, KY and completed her undergraduate education at Western Kentucky University. She chose the Trover Campus because of her interest in primary care and serving rural areas. She enjoys traveling, watching baseball, and baking.

ARE YOU A DOCTOR?

Micah Kaiser, BS, & William J. Crump, MD

PROLOGUE

In my role as Associate Dean of the University of Louisville School of Medicine rural regional Trover Campus in Madisonville, Kentucky, I have watched our student-directed free clinic transform since we began in 2004. This process accelerated when the COVID-19 epidemic forced us to transition to entirely telemedicine visits. Although communicating via phone with our uninsured, low-income patients was a challenge and some didn't have video capability, our students got quite comfortable with these virtual visits, staffed by me.

We began cardiovascular screening at local food banks as our next step, and then most recently at the newly established Salvation Army homeless shelter. Until about a year ago, our town of 20,000 with a very sophisticated medical system lacked such a facility. The homeless in rural places are less concentrated so less visible, but we knew they were there.

The story recounted below shows our most recent phase of providing impromptu portable clinic sessions, staffed by me. Even though the patient discussed had insurance and some family support, just being in a shelter provided obstacles. That same day, we saw another patient with no family support and no phone, who had been off her blood pressure and diabetes medicines for almost a year. By working with our local health system to get labs done and choosing medications from the $4 list at a local pharmacy near a bus stop that accepts the shelter's vouchers, she is now being treated appropriately. But what is most important is the sense of pride and ownership that my students feel providing this service. Community medicine concepts cannot be taught in a classroom, and the value of community engagement is learned best by personal experiences. I have watched this process develop in our students, and it provides meaning for all of us.

- Bill Crump, MD

A PATIENT STORY

"Are you a doctor? I've been having this stabbing pain in my belly for the past week and I've had ulcers in the past." This was how the patient greeted me as I entered the homeless shelter to do cardiovascular screenings. She had seen my scrubs but not yet my badge and assumed I was a physician. Little did she know how distant I felt from being a physician as a third-year medical student. I told her that I was not, but in my free-clinic role I could see her as a patient and maybe help. I made this bold statement

knowing that a real physician would see her after me to verify that she received high-quality care and that I didn't miss anything.

For the past year, we had been doing cardiovascular screenings in the shelter, measuring blood pressure, blood sugar and total cholesterol. If any one of these was abnormal, we recommended the patient see a provider or see us in our student-directed free clinic to address the issue. If any measurements were far beyond normal limits, we recommended they seek more immediate care. We had recommended that one woman go to the ED urgently - she was later found to be having a myocardial infarction. Unfortunately, there was a glaring gap in our strategy. It was almost impossible for the patients we screened in this homeless shelter to take return calls when they tried to make a medical appointment and we couldn't reach them to remind them of their appointment with us. Most had cell phones, but their minutes were very limited, didn't have text capability and most didn't use voice mail. They only answered numbers they recognized, not so different from us. So even though there was a low-cost city bus service that had a stop at the shelter, follow up visits weren't happening. So, we ultimately made the decision to hold patient visits in the shelter at the same time we did the screening, to ensure that no patients got lost to follow-up.

The woman with the stabbing belly pain was the first patient encounter I had in our new system. As I began talking with her, I really began to understand the difficulties that underserved patient populations in chaotic social situations deal with on a regular basis. She stated that she hadn't signed up with any designated person since she'd moved here from Ohio several months ago, but did see an APRN at a local urgent care occasionally. Her medical history in her words included previous strokes with some slow thinking afterwards, heart attacks, stomach ulcers, frequent UTIs, COPD, DM and HTN. She was taking "way too many" medicines, but couldn't remember the names or dosages. She said her blood pressure typically ran about "70/30."

She reported diffuse right sided belly pain and flank pain that had been worsening for a week. She had nausea without vomiting and fatigue, dysuria and dark-colored stools. On exam, her blood pressure was 113/65 and she had diffuse right sided abdominal tenderness that may have been a little worse in the right upper quadrant, and positive CVA tenderness bilaterally. The tenderness though varied greatly, in severity and location, with repeat exams done a few seconds apart.

Our initial concerns were for a UTI or cholelithiasis. She could not remember ever having an ultrasound examination of her abdomen. We told her our thoughts and she was agreeable with our plan. We ordered an abdominal ultrasound which later showed no abnormalities, CBC was normal, and urine showed more than 100,000 colonies of Klebsiella pneumoniae resistant only to Ampicillin. We called her and she recognized our number and answered. We suggested she see her APRN soon at the local urgent care or see us at our next visit to the shelter and called in trimethoprim/sulfa (Bactrim) BID for seven days.

She was one of the earliest patients in our new system, but she really highlights its success. Currently, many physicians are not available for patient appointments until weeks ahead. Urgent care provides little continuity and these are overwhelmed with each new COVID-19 wave. The individuals in the shelter simply can't navigate all the obstacles. So, the ability to offer "on the spot" visits to these patients who are already underserved is very valuable. What we provide may be the best—and the only—opportunity for them to receive timely medical care. As a medical student, the value to my education of providing this service is the ability to take responsibility for a patient who would not receive care otherwise. It is significantly more responsibility and ownership over patient care than I usually experience, and with that, it creates a learning experience like no other. This level of patient ownership reminds me of why I wanted to be a physician in the first place: to help those who are in need.

Micah Kaiser is a third-year Trover Rural Track medical student, University of Louisville School of Medicine Trover Campus.

Dr. Crump is the Associate Dean, University of Louisville School of Medicine Trover Campus (KMA and Hopkins County member).

BY SARAH PARKER, MS4, ULSOM TROVER CAMPUS

WHO REALLY WANTS TO BE SOMEBODY'S DOCTOR?

Prologue

For almost 40 years at four academic institutions, I took it as my personal mission to convince the right medical students to become family physicians. Policy experts say that we need to double or perhaps triple the number of graduating medical students to choose our specialty. There are tremendous barriers. We are not paid enough for our work as we coordinate our patients' care, and the bureaucracy of prior authorizations and the tyranny of electronic medical records make it hard to get through the day with joy. But it is when the exam room door is closed, and we can focus on the patient with us that we find that joy. Medical students are naturally risk-averse and like to keep all their options open. Many who are family doctors at heart choose Med-Peds just because they can keep the option open to subspecialize later and have an easier life.

I asked Sarah Parker to put her thoughts on paper as she begins residency interviews as an example of a success. I first met her in 2015 when she did our college rural scholar program. Then she participated in our three-year accelerated medical school program that put her into a rigorous outpatient clerkship in the summer between her M-1 and M-2 years. Upon reflecting on her time in clinic before her M-2 year, her preceptor, Dr. T. Michael Adams, had this to say: "Occasionally, a teacher/clinician has a student like Sarah who stands above others with regard to motivation and skill sets... We need more like her." In her M-3 year, she was clearly in her element when managing her continuity patients in our free clinic.

Sarah's essay reminds us all that no matter how busy we are, we can find the time to accommodate students in our practice. And it is just as important that they see us outside of the office advocating for our community. We must be doing something right.

Bill Crump, MD
Associate Dean
ULSOM Trover Campus

Why I Chose to be a Family Medicine Doctor

Committing to a specialty is no easy task. After a single year of clinical training largely in the hospital, when you're finally getting comfortable, you must decide which direction to take for the rest of your career. Though I'd shadowed plenty of physicians in outpatient offices throughout college, I had next to no idea what went on in a hospital and I couldn't even dream up all the different services they have to offer. Growing up in Western Kentucky in my mom's beauty salon and dad's auto repair shop, I knew absolutely nothing about the service differences among the ED, urgent care, or a primary care office. I quickly realized in medical school what I enjoyed most was figuring out ways to get my patients the care they needed as easily and conveniently as possible, and doing all of this so they wouldn't require hospitalization.

Because I wanted an even closer look at what it would be like to be a small-town family doctor, I signed up for an accelerated track over the summer between my first and second year of medical school to complete clinical rotations. This was my first true, hands-on medical experience. I was handed a laptop and was set free to see basically everything that walked through the door. Here I learned what a full-spectrum doctor really looked like in-action. After rounding on his hospital patients in the morning, my attending and I spent days seeing everything from rocky mountain spotted fever to brown recluse bites, bullous pemphigoid, and bilateral toenail removals. Here I saw the hodge-podge of medicine that healed each patient holistically, not just based on body system or condition. I really fell in love with being on the "front line" too. Every patient was like a mystery box.

Going into my third year, I still didn't know with 100% certainty that family medicine was my calling. I knew I loved the outpatient primary care world, but the hospital was still a foreign place and along with it, all those specialties that are primarily at the hospital: surgery, OB, internal medicine. I put these rotations first in my M-3 sequence. One by one, I found that I cared more about how they work together than how each one individually acted alone. EKGs are great, but the cath lab is cold and dull. And how could I say goodbye to that cute kid after their appendix removal? I found myself collecting people. My favorite part was getting them ready for discharge. I loved sitting down with my hand-written instructions on how to continue the healing process from home. I took care of some continuity patients at our student-directed free clinic. I cared for one uninsured patient with poorly controlled diabetes who made a strong impression. Over the course of a year, I helped manage her medications through free drug manufacturer-sponsored patient assistance programs and lowered her Hemoglobin

A1c from 11.5% to 7.1%. Coordinating all of this involved many lengthy conversations with my patient and I enjoyed the relationship I built with her over the course of a year. That's when I really knew family medicine was for me.

In addition to the valuable relationship I built with my patient, I also related to the hardship of being uninsured and have always felt the drive to serve this population. I realized early on that becoming a doctor, with all its hardships, would take me to a much higher socioeconomic level than I had when I was growing up. All the while, I would know that those working in the community alongside me provide services just as important and receive much lower compensation. I've always wanted to find ways to give back to my community outside of traditional medical care. In my search for inspiration, everywhere I looked it seemed that family doctors were leading these endeavors. They run free clinics, nursing homes, health departments, addiction treatment centers, and attend local sports games. They are virtually everywhere the patients are, and those qualities spoke to the heart and soul of why I chose to do medicine. This inspired me to create my own research project to interview our student-directed free clinic patients about their social determinants of health needs as part of an AAFP-sponsored leadership project.

Even with all these rich experiences, I must say that the specialty decision didn't come without some long hard talks with myself about why I even decided to become a doctor in the first place. Along the way, I met physicians I respected in other specialties that look down on family medicine physicians. In the end, I knew I was trading super-specialized care for the training that would make me more versatile overall, so I could attend to the needs of an entire person and entire communities. I knew that if I chose internal medicine, I'd be closing the door on a whole lot of training in outpatient care that I liked much more. I knew I'd be missing out on the huge amount of medicine that happens outside the hospital that I feel is even more important. I knew I couldn't be happy as a sub-specialist as I was already bored with seeing the same five or six diagnoses over and over again. I want to be as versatile as possible. I want to be trained in behavioral and addiction medicine, skin biopsies, LARCS and Pap smears, and have strong training in treatment of musculoskeletal injuries. When it comes to primary care, I knew that this versatility was incredibly important to my training and ultimately led me to choose family medicine.

Sarah Parker is from Murray, KY and completed her undergraduate work at the University of Louisville. While in college, she participated in the Trover Campus College Rural Scholar Program. She is a 2021 Scholar in the AAFP Family Medicine Leads Emerging Leader Institute program and has submitted her project "Perceptions of Social Determinants of Health in a Student-Led Free Clinic: Do students see things differently from their patients?" as a manuscript to the AAMC- sponsored Journal of Regional Medical Campuses.

JRMC Journal of Regional Medical Campuses

A Student-Directed Community Cardiovascular Screening Project at a Regional Campus

Emma C. Doyle, BS; William R. Southall, BS; Blake S. Edmonson, BS; William J. Crump, M.D. Associate Dean

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A Student-Directed Community Cardiovascular Screening Project at a Regional Campus

Emma C. Doyle, BS; William R. Southall, BS; Blake S. Edmonson, BS; William J. Crump, M.D. Associate Dean

Abstract

Introduction

Cardiovascular disease (CVD) is an important threat to public health, especially in rural communities. Clinical medical students at a rural regional campus can be a valuable resource to plan and implement CVD risk factor case finding project in the host community.

Methods

Directed by a representative county advisory council and supervised by a regional dean, clinical medical students designed and implemented CVD screenings at several public locations, recording health history and measurements of blood glucose, total blood cholesterol, and blood pressure. Those screened with abnormal readings were directed to definitive care including the local student-directed free clinic. Students were surveyed using a Likert scale before and after participation to assess their confidence in executing a community health project. The host health system IRB approved the protocol as exempt, and the authors have no conflicts of interest.

Result

Over a period of almost 2 years in 2017 and 2019, a total of 572 participants were screened. The demographics reflected those of the entire county, except screening was focused on adults. High blood pressure was found in 43%, high glucose in 28%, and high cholesterol in 48%. These values were similar to published countywide prevalence proportions. The student pre- to post- increase in confidence was remarkable ($p < 0.001$).

Conclusions

Our results show that regional campus medical students directed by a representative county advisory council and supervised by a regional dean can successfully implement a community CVD screening effort. The students also expressed a dramatic increase in their confidence in designing and implementing such a project. Lessons learned are shared for consideration by those at other regional health campuses.

Introduction

Cardiovascular disease (CVD) remains one of the greatest threats to public health in both urban and rural communities in the United States. The burden of cardiovascular disease is heavier in rural communities, due to higher prevalence of diabetes, obesity, hypertension, lack of physical activity, and tobacco usage.[1,2] Many interventions have targeted individual CVD risk factors, aiming to reduce one risk factor at a time, while failing to include in the intervention the local health care facilities that provide definitive care.[3-7] Medical students at a regional medical school campus can be valuable contributors in rural communities' CVD prevention programs.[8] Teaching future physicians to design a community-based project also gives them valuable

Emma C. Doyle, BS, Trover Rural Track Student, University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville, Madisonville, Kentucky
William R. Southall, BS, Trover Rural Track Student, University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville, Madisonville, Kentucky
Blake S. Edmonson, BS, Trover Rural Track Student, University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville, Madisonville, Kentucky
William J. Crump, M.D. Associate Dean, University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville, Madisonville, Kentucky
Corresponding author: William J. Crump, M.D. Associate Dean University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville 200 Clinic Drive, Third North Madisonville, KY 42431 p. 270.824.3515 f. 270.824.3590 e. bill.crump@bhsi.com

skills for designing and implementing future screening efforts after graduation.[9]

The most comprehensive rural community project reported in the United States was implemented and sustained in Franklin County, Maine from 1970 to 2010.[10] The prevention program included educating residents on healthy lifestyle habits such as smoking cessation as well as screening for hypertension and hyperlipidemia in an effort to decrease CVD, hospitalization, and mortality. Participants who were found to have uncontrolled risk factors for CVD were referred to local clinicians for treatment. This 40-year effort started with just screening and included active involvement of the community driven by an advisory council made up of local physicians and community leaders including local business owners, teachers, and nurses. Early on, this group found that there were not enough easy access, low-cost options for primary care in their community, so they established a nonprofit medical practice dedicated to providing this care.[10] Later, they also partnered with the local hospital and regional campus of the state university.[11-12] The program resulted in hypertension control rates increasing from 18.3% to 43.0% and elevated cholesterol control rates increasing from 0.4% to 28.9%, leading to 1.7% fewer hospitalizations per capita and a lower age adjusted mortality rate of 60 fewer deaths per 100 000 residents.[10] These results suggest that CVD screening and intervention programs implemented in rural, low income, and predominantly white communities can have significant positive outcomes.

From 1972 to 2012, a community CVD screening and education program in North Karelia, Finland used community-based interventions and national level policy changes to reduce the levels of smoking, hyperlipidemia, and hypertension in the population.[13] The program utilized legislation, local media outlets, community meetings, and pamphlets to educate the population on CVD behavioral risk factors. The aim was to reduce smoking rates and reduce intake of saturated fat and salt. The program resulted in 20% lower cholesterol levels and a reduction of mean systolic blood pressure measures from 149 to 134 mm Hg in men and 153 to 127 mm Hg in women. Smoking rates decreased from 51% to 36%. The reduction of these 3 CVD risk factors resulted in a decrease of cardiovascular mortality from 690 deaths per 100 000 to 100 deaths per 100 000.[13]

Another CVD screening and intervention program implemented in rural Västerbotten County, Sweden resulted in a 12.1% reduction in all-cause mortality for women and a 7.8% reduction in all-cause mortality for men.[14] The program was overseen by a scientific advisory board from Umeä University, consisting of cardiologists, family medicine physicians, and epidemiologists as advisory board members. From 1990 to 2006, all citizens aged 30, 40, and 60 years in the county were invited to a health screening where participants would undergo an oral glucose tolerance test, along with screenings for blood lipids, body mass index, and blood pressure. Participants also completed a comprehensive questionnaire to assess their socioeconomic status, psychosocial conditions, self-reported health, family history of CVD and diabetes, quality of life, and lifestyle habits including level of physical activity, alcohol and tobacco usage, and diet. Following the questionnaire and screening, results and responses were discussed with the patient by a nurse employed by the program using motivational interviewing.[15] The nurse would present each participant with a visual representation of their risk factors for CVD to encourage lifestyle modification. All the screening measures took place at a participating primary healthcare facility in the county. Follow-up visits were scheduled with the nurse at the same healthcare facility when warranted, along with referrals to the participant's family physician for further assessment and therapy as needed.

Another rural community program was completed in 2009 in rural New Ulm, MN, population of 13 522. Heart health screenings, a local weight loss competition, nutrition education sessions, and a phone coaching program for those with high CVD risk factors were implemented to engage the community.[16] The program resulted in increased physical activity from 62.8% to 70.5% and improved nutrition as defined by eating 5+ fruits/vegetables per day from 16.9% to 28.1%. Limited changes were seen for smoking, alcohol consumption, and stress.[17]

In 2010, Johns Hopkins University began an interdisciplinary CVD disparities training and career

development fellowship program.[18] The curriculum included monthly CVD disparities didactic lectures along with participation in mentor-guided research of CVD health disparities among African American women.

A student-directed program at the University of Miami Miller School of Medicine provides free blood glucose, blood lipids, and blood pressure screenings and other examinations at free health clinics throughout the rural Florida Keys.[19] When abnormal results were found, students referred participants to seek care at reduced cost clinics. Students that participated in the rural health fairs tended to practice in low-density populated areas after graduation.

One systematic review of student-run CVD community health interventions found that the projects demonstrated a short-term decrease in HbA1c ranging between 0.9 and 1.7%, a decrease in LDL ranging between 12 and 34.5 mg/dL, and a decrease in blood pressure ranging between 5.2 mm and 9.5 mm systolic pressure and 5.7 mm and 6.8 mm diastolic pressure.[20] The studies included in this review ranged from 6 to 12 months of intervention.

We report here the initial results of a community-based CVD screening effort led by medical students at a regional medical school campus, directed by a county advisory council, and supervised by the regional dean. The host community for the campus is remarkably similar in demographics, population, and socioeconomic descriptors to Franklin County, Maine. This screening effort was considered the first step to a long-term plan to replicate the interventions that were part of the later years of the Franklin County Maine project.

Methods

The regional campus is located in a town of 20 000 in the upper southeast.[8] Clinical medical students are active in the community and have managed a local free clinic since 2004. The purpose of the campus is to produce physicians for the region's small towns by training students with rural upbringing in a rural community setting. As a part of the longitudinal community medicine training of these regional campus medical students, community screenings were performed beginning in 2017. A student free clinic director scheduled M-3 volunteers for each screening, working around the most demanding rotations. Every M-3 student volunteered for at least one session, and most did several. During the summer pathways programs, rising M-1 and M-2s joined the M-3s, with all volunteering at least once. Screenings at typical "health fair" events resulted in reaching those who had the resources to get to the typical mall or civic-club sponsored events, which was not the low resource target population. To solve this problem, a steering committee was formed that, over the next 2 years, became an advisory council. Council members were chosen from those who were in touch with underserved populations and knew when the target population would be gathered for some other purpose (see Table 1). This resulted in a dramatic shift for screening to be scheduled where and when requested by informal and formal leaders of the target groups, even if this was inconvenient for the medical students, such as a Saturday morning food bank.

Table 1: Advisory Council Positions

President, City-County Economic Development
Director, Housing Authority
Co-Director, Saturday Session Food Bank
Pastor, Prominent Black Congregation
Director, Weekday Food Bank
President, Local Community College
Business Liaison, Regional Jobs Program.

A screening station was set up where people were waiting in line to receive free goods or services unrelated to the screening with a large sign and a community volunteer who walked along the line explaining the screening. The first step was a simple risk assessment written at the sixth grade reading level and, if necessary, administered verbally to the screened individual (see Table 2). The health risk assessment recorded the participant's past medical history of CVD-related illnesses and events, level of physical activity, quality of diet, tobacco product usage, form or lack of health insurance coverage, and

use of a primary care provider. Next, the client moved one chair over where a single finger-stick was performed resulting in a total cholesterol and blood glucose. The medical-quality machine took about 3 minutes to produce a result, and the medical student used this time to review the health history on the form and address the client's questions. The client then moved one chair over again to a medical student who measured the blood pressure with an automatic, validated machine, then the student reviewed all the results with the client. The students were careful not to provide any medical advice, but each participant was provided with individualized lifestyle advice. If the client had a primary care provider (PCP), the student did advise how soon the client might seek an appointment based on the results. The client was provided a card showing all the results to be taken to the PCP. If the client did not have a PCP, the student explained how the student -directed free clinic works and added the date and time of the client's appointment at the clinic to the results card. The back of the card included information about available low-cost transportation options. All free clinic appointments were scheduled within 6 days from the screening date.

Table 2: Cardiovascular Screening Health Risk Assessment

Mark all known health conditions that you have had in the past.	• Congestive Heart Failure • Stroke • Diabetes Mellitus • Heart Attack • Hyperlipidemia • Hypertension
Circle the number which best identifies your response to each of the statements (1 indicating almost never, 2 indicating sometimes, and 3 indicating almost always.)	• I exercise 20-30 minutes each day for at least five days each week. (1…..2…..3) • I eat five servings of fruits and vegetables every day. (1…..2…..3) • I enjoy sitting more than physical activity. (1…..2…..3) • I eat foods high in fat. (1…..2…..3) • I see my doctor for regular checkups. (1…..2…..3)
Circle TRUE or FALSE to answer each statement.	• I use tobacco products or e-cigarettes. (TRUE or FALSE) • I have a physical limitation that keeps me from exercising. (TRUE or FALSE)
Circle YES or NO to answer each question.	• Have you completed a screening with us before today? (YES or NO) • Have you seen your doctor within the past 12 months? (YES or NO) • Do you have health insurance? (YES or NO)
If you do not have a primary care doctor, may we contact you to help you find a doctor? If yes, please fill in your contact information.	• YES or NO • Phone: • Name: • Address:
Today's test results:	Blood pressure: Blood cholesterol: Blood glucose:

Results:

Table 3 describes sites where CVD screenings were conducted. The greatest participation was at food banks, where a large number of would-be-participants were available while waiting in line. Some other successful venues included street fairs and job fairs.

Table 3: Sites of CVD Screenings

Food Banks	320
Community Fairs	125
Job Fairs	58
Civic Club Meetings	32
Churches	16
Immunization Clinics	14
Hospital Housekeeping	7
TOTAL	572

Table 4 displays the demographics of screened participants. Most of the participants were white, which is representative of the county as a whole. The age of participants ranged from 19 to 59 years, and more males were screened.

Table 4: Demographics of Population Screened

Gender n = 531[a]	n (%)	Percent Population of County[b]
Male	344 (64.8%)	48.8%
Age at time of Screening n = 515[a]	n (%)	Percent Population of County[b]
19 – 59	327 (63.5%)	58.3%
60+	179 (34.8%)	19.0%
0 – 18	9 (1.7%)	22.7%
Race/Ethnicity n = 490[a]	n (%)	Percent Population of County[b]
White	395 (80.6%)	90.0%
Black or African American	80 (16.3%)	6.8%
Hispanic/Latinx	7 (1.4%)	2.2%
Other	6 (1.2%)	2.3%
American Indian and Alaska Native	2 (0.4%)	0.3%
Asian	0 (0.0%)	0.6%

[a]n excludes missing information not provided by participants.
[b]County values obtained from U.S. Census Bureau (21).

Table 5 shows the percentage of abnormal blood pressure, blood glucose, and blood cholesterol readings we collected, using two threshold values defining "abnormal" for each element.

Table 5: CVD Screening Results

	Abnormal Blood Pressure n = 547[a]	
	Systolic > 140 OR Diastolic > 90	Systolic > 150 OR Diastolic > 100
Abnormal with Previous Diagnosis	117 (20%)	66 (12%)
Abnormal with NO Previous Diagnosis	134 (23%)	64 (11%)
	Abnormal Blood Glucose n = 469[a]	
	Blood Glucose > 110 mg/dL	Blood Glucose > 125 mg/dL
Abnormal with Previous Diagnosis	76 (13%)	64 (11%)
Abnormal with NO Previous Diagnosis	85 (15%)	49 (9%)
	Abnormal Total Cholesterol n = 471[a]	
	Total Cholesterol > 160 mg/dL	Total Cholesterol > 180 mg/dL
Abnormal with Previous Diagnosis	64 (11%)	48 (8%)
Abnormal with NO Previous Diagnosis	211 (37%)	144 (25%)

[a]Excludes missing information when participants declined this portion of the screening.

Table 6 displays the prevalence of diagnosed hypertension, diabetes, and hyperlipidemia in the county, as compared to the percent of abnormal readings for blood pressure, blood glucose, and total cholesterol we found in our screenings.

Table 6: Prevalence of CVD Risk Factors in County

	%Prevalence in county[a]	% in sample with abnormal readings, lower cutoff limit.	% in sample with abnormal readings, higher cutoff limit.
Hypertension	33%	43%	22%
Diabetes	20%	28%	20%
Hyperlipidemia	38%	48%	33%

[a]County data retrieved from Centers of Disease Control and Prevention, BRFSS Prevalence and Trends Data[22]

Before and after the regional campus programs that included the screenings, we surveyed the students involved concerning their confidence in their ability to design and implement a community project (see Table 7). Participants reported a large increase in confidence. ($p = 0.001$). Sixty-two percent (42/68) of our students were female and 84% (56/68) were from small towns, which we defined as a population fewer than 30 000 and non-metro Rural Urban Continuum Code.[23]

Table 7: Student Opinions

	strongly disagree		somewhat agree		strongly agree[a]		
	1	2	3	4	5	Total	P[b]
Pre-test	1 (1.4%)	9 (13.0%	22 (31.9%)	23 (33.3%)	14 (20.3%	69[c] (100.0%)	
Post-test	0 (0.0%)	0 (0.0%)	11 (15.5%)	30 (42.3%)	30 (42.3%)	71 (100/0%)	<0.001
Student Comments							
"It was amazing to see how willing some people were to participate. Even those who had not seen a doctor in many years were eager to see their results."							
"What surprised me most was that our participants were so willing to share their lives with us, as well as participate in our screenings. One lady at the food bank shared with me very intimate details of her life, including struggles with her family, which I think became therapeutic for her in and of itself."							

[a]I am comfortable planning and implementing a community health project or I have a good understanding of what it takes to design an effective community activity.

[b]Mann-Whitney U = 1503.0, $n_1 = 69$ $n_2 = 71$, $P < 0.001$ two-tailed.

[c]Two students did not complete their pre-test

Discussion

Overall, we accomplished our goal of demonstrating that a group of students based at a regional medical school campus could plan and implement a successful CVD screening program. We learned that students' confidence in their ability to design and implement a community health project was increased dramatically. It is our hope that the training in a community health project was successful in preparing our students to implement other projects in the future in the communities they will serve as physicians.

Our sample yielded a percentage of participants whose abnormal readings were like those of the entire county, suggesting that they are representative of the larger population. These initial results provide a good basis for designing the implementation phase of our project.

Limitations:

Although the primary data focus of the study was to estimate overall CVD risk, without an HDL value we were not able to calculate a numerical risk using calculators based on national evidence. Test strips that measured total blood cholesterol cost approximately $1, while the test strips used to measure HDL along with total cholesterol cost approximately $8. Our funding for this study was not sufficient to use the more expensive strips, so only total serum cholesterol could be measured. Future screenings could benefit from increased funding to measure HDL levels.

Additionally, a formal diagnosis of hypertension requires 3 separate high blood pressure readings on three different occasions. Because we only measured blood pressure several times at one sitting, no definitive diagnosis of hypertension could be made. Participants with elevated blood pressure readings were directed to a definitive source of care so that a diagnosis of hypertension could be made if appropriate. Our blood glucose readings should be considered random measures, as we were unable to know precisely when the patient last ate.

Although we attempted to choose representative screening venues, we went only where we were invited, directed by our advisory council's community contacts. Our initial results may be subject to selection bias. Our original plan was to gather regular data over several years. However, the COVID-19 pandemic forced us to suspend operations at our screening locations, limiting our results to a 2-year period. We expect to return to regular screenings soon and will track how many participants subsequently become established with our free clinic.

The Future

Due to loss of funding and logistical obstacles, the renowned Franklin County CVD prevention program reduced its leadership, staff, and programs beginning in 2001. From 2006 to 2015, the county saw a gradual increase in smoking and mortality rates. By 2015, Franklin County's mortality rate had risen to be no better than the expected mortality rate of Maine based on income.[24] This shows that a CVD screening program built over almost 25 years may lose its benefits within 10 years if continuity is broken. With sustained funding and support from the community, we hope we can avoid this problem as we continue to plan the implementation phase of our effort.

Conclusions

Our results show that regional campus medical students directed by a representative county advisory council and supervised by a regional dean can successfully implement a community CVD screening

effort. The students also expressed a dramatic increase in their confidence in designing and implementing such a project. Lessons learned are shown in Table 8, which we offer for consideration by those at other regional campuses.

Table 8: Suggested Strategies for a Successful Community Project

- Identify a clinical/administrative leader with enough influence to act as project champion.
- Establish a representative advisory council with frequent free lunch meetings.
- Identify a need or risk factor in the community.
- Include enthusiastic lay volunteers to facilitate screenings.
- Go where and when you are invited to conduct screenings.
- Have the ability to schedule referral for definitive care "on the spot".
- Identify where the at-risk populations will be waiting for another reason.
- Be efficient with the time that participants give you; about 5 to 6 minutes.
- Listen to feedback from the Advisory Council, students, and those screened.
- Be willing to make adjustments as challenges arise.

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A Teleneurology Teaching Service at a Rural Regional Campus: An Effective Solution When Specialty Availability is Limited

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Abstract

Regional rural medical school campuses offer many opportunities for medical students to gain more hands-on experience, have more direct interaction with attending physicians, and cultivate a deeper understanding of challenges and opportunities specific to rural medicine. Some specialty services such as neurology are not always readily available at these small regional campuses, and telemedicine technology can be a valuable tool to address this need. We report the implementation of teleneurology stroke consultation services as part of the third-year neurology clerkship at a regional medical school campus. We analyzed daily clinical notes and student satisfaction surveys. Students saw many common presentations of cerebrovascular events as part of a multi-disciplinary care team. While students followed patients through their hospital course they were provided effective instruction by remote stroke neurologists. All students strongly agreed that telemedicine was a positive component of the clerkship. We conclude that teleneurology is effective in providing inpatient neurology clinical exposure, especially when remote attendings have a strong screen presence and are enthusiastic about teaching. We believe these findings could be useful to other campuses considering similar teaching methods, as innovations in telemedicine continue to address challenges in medical education and clinical care.

Introduction

Telehealth is the broad term that describes the vast range of technology used to connect healthcare providers to patients and other providers. Telemedicine is a more specific term referring to the provision of medical care remotely through electronic communication between a health care provider and a patient. The use of telemedicine dates back to the 1940s, however, the advancement of technology has propelled this field forward with growing interest.[1,2] Increasing internet speed and access along with widespread use of technological devices, such as smartphones and computers, in rural areas has opened the door for telemedicine to meet challenges regarding access to primary and specialty medical care.[3] In addition to its application in addressing physician shortages in the rural setting, telehealth has become an invaluable tool in the fight against the novel coronavirus disease (COVID-19). Not only has the use of telemedicine increased exponentially, we have also witnessed a surge of interest in telemedicine by the United States population.[4]

Neurology is a specialty that has a significant provider shortage in comparison to the growing population in need of these services.[5] This is particularly evident in

Anne-Taylor Beck, BS, M-3 Medical Student University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville (ULSOM Trover Campus)**; Leeandra B. Cleaver, BS,** M-3 Medical Student University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville (ULSOM Trover Campus)**; Joshua D. Fuqua, BS,** M-3 Medical Student University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville (ULSOM Trover Campus)**; Katlyn B. Clark, BS,** M-3 Medical Student University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville (ULSOM Trover Campus)**; Rohit S. Nair, MS, MBA,** M-3 Medical Student University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville (ULSOM Trover Campus)**; E. Paige Hart, BA,** M-3 Medical Student University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville (ULSOM Trover Campus)**; Rebecca R. Bolinger, BA,** M-3 Medical Student University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville (ULSOM Trover Campus)**; William J. Crump, M.D.,** Associate Dean, University of Louisville School of Medicine Trover Campus at Baptist Health Madisonville (ULSOM Trover Campus)

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rural regions of the United States where there are large differences in rural-urban neurologist density.[2] An effective solution in many of these underserved regions comes in the form of telemedicine or, specifically, "teleneurology". Teleneurology is a specialized form of telemedicine where a neurologist sees patients remotely, whether it is in the outpatient setting for chronic neurologic conditions or for inpatient acute care.[6] This approach utilizes synchronous communication methods via live audio and video to provide comprehensive neurology care to a rural patient population.

Small regional medical school campuses have many benefits, including one on one teaching, carrying responsibilities of an intern, and collaborating with many members of the care team. This environment provides students with unparalleled hands-on patient and care team experience, which later contributes to a vital skill set utilized daily as a resident physician. Despite the many advantages of this training environment, there are challenges for regional campuses. One such challenge is decreased availability of specialty providers (i.e. neurologists, dermatologists, rheumatologists) in the rural setting, resulting in minimal on-site training opportunities with these specialists.

The team of physicians serving our rural medical campus included neurology until 4 years ago. The lack of a neurologist presented a gap in the required neurology clinical experience for the rural track medical students. One possible solution was to have the rural-based students travel back to the main campus university hospital, located 160 miles away, to complete this rotation. Returning to the urban environment for the 4-week rotation was not ideal due to the student housing obligation, disruption of rural-focused training,[7] and the interruption of longitudinal student experiences including regular small group teaching sessions and providing care for longitudinal patients at the weekly student-run free clinic.

It was ultimately decided that the rural-based students would commute an hour away to a neurologist's office 2 to 3 days a week, and on the days students did not commute, they spent time with sleep medicine and inpatient geriatric psychiatry on the rural campus. These clinical experiences provided opportunities to learn about the presentation and management of chronic plus outpatient neurological diseases including insomnia, narcolepsy, restless legs syndrome, Parkinson's disease, multiple sclerosis, other neurodegenerative diseases, dementia, and delirium. The adapted neurology curriculum produced comparable student performance on shelf exams and student feedback when compared to main campus students.

Despite providing rural students with adequate chronic and outpatient neurology clinical experience, there remained a significant learning gap in acute inpatient neurology care. In the spring of 2019, the hospital which hosts the medical campus began the process of implementing teleneurology stroke consultation with full-service care beginning in summer 2019. Not only would this address an evident need for acute neurology care in our rural area, but also it held significant potential to meet the educational need for the rural medical students.

A literature review revealed no publications about student educational outcomes or opportunities involving telemedicine used in rural medical student training sites. Most research published to date emphasized rural inpatient outcomes in acute teleneurology or telestroke services[2,5,6,8,9,10] or focused on the need for additional neurology resident or medical student training on general telemedicine practices.[11,12,13,14,15,16] An essay was recently published describing the anecdotal experience by the first student to participate in this learning experience.[17] This study describes in detail the results of the first semester of the new teleneurology teaching service, including student evaluations and the clinical characteristics of the patients seen. We hope this report may serve as a guide for other regional medical campuses considering similar teaching methods.

Methods

Our regional medical campus is located in a Madisonville, Kentucky, which has an approximate population of 20 000. This campus is the primary clinical training site for 14-16 allopathic third- and fourth-year medical students who move here after

completing the first 2 years of basic science education at the main urban campus 160 miles away. Students who have a proven affinity for rural settings are assigned at the time of admission to medical school to this campus where they have the opportunity for unique, first-hand clinical experiences with rural and underserved patient populations. These students complete required third- and fourth-year clerkships and electives in this rural setting and work closely with their respective attending faculty, typically in a one-to-one apprenticeship model. Academic outcomes including clerkship shelf exams and step 2 USMLE scores are comparable to those of main campus students.[18] One of only 2 published multivariate analyses of predictors of rural practice showed that participation at this campus was the strongest predictor even when controlling for the usual variables of rural upbringing and family medicine specialty choice.[19]

Design of Telestroke Teaching Service

The inpatient teleneurology care team began full-service acute stroke care at our regional medical campus in August 2019. The students reported here rotated with the team during the winter of 2019/2020 and then after the gap necessitated by the pandemic another student rotated in the fall of 2020. Teleneurology care was provided via live communication using a standard healthcare cart, HP all in one central processing unit (CPU) and monitor and a standard 20x zoom remotely controlled camera (Figure 1). This system used the hospital password protected secure wireless internet connection and allowed the teleneurologist to interact with patients and their families from his or her urban referral hospital location in a synchronous manner. This design also facilitated close synchronous interaction and communication with the comprehensive rural neurology care team, including a Physical Therapist (PT), Occupational Therapist (OT), nursing staff, speech therapist, and the rotating medical student. A dedicated nurse practitioner (APRN) was added to the team in the spring of 2020. The medical student made daily rounds with the inpatient neurology team 2 to 3 days per week for the duration of the 4-week rotation and followed their stroke patients between commuting days to the outpatient neurologist. There were no audio or visual technical diffuclties. However, in the case of technical difficulties, all members of the team have direct access to the neurologist and IT support by telephone.

Figure 1. [Teleneurology cart setup].

When a patient presented to the Emergency Department (ED) or had an acute change suspicious of stroke while hospitalized for another reason, a "code stroke" was called within the hospital. This resulted in a rapid cascade of events where the on-call neurologist was notified promptly. Often, the rotating medical student (or nurse practitioner) was the first member of the team to assess the patient following a code stroke. The student was often responsible for transporting the teleneurology robot to the ED or patient room. This process allowed for stroke patients to be seen and evaluated within 30 minutes of the "code stroke" by the on-call neurologist.

When the attending neurologist appeared on screen, he or she began their assessment and followed

typical stroke protocol. If a cerebral vascular event (CVE) or transient ischemic attack (TIA) not requiring neurosurgery was suspected, the patient was admitted to the hospitalist service in the Critical Care Unit (CCU) and followed by the teleneurology team. If tissue plasminogen activator (TPA) was appropriate, it was administered in the CCU. Patients with a clinical presentation and imaging consistent with hemorrhagic stroke were promptly evaluated and transported to the neurosurgical-capable facility one hour away.

Each morning the neurology care team met in the ICU conference room for morning report to review and discuss new and follow-up patients. The medical student completed pre-rounds on all patients before morning report, completing a full history and physical examination. The student documented his or her findings with a detailed teleneurology daily record note. Any updates on the patients were presented during morning report. Team members from PT, OT, nursing, and speech contributed their discipline specific updates for each patient.

When morning report was finished, formal rounds began. The team went to each patient room and the neurologist, via the robot, conducted a focused history and neurological exam. The medical student performed most of the neurological exam. This not only allowed the neurologist to see the exam findings, but also provided an opportunity for one-on-one instruction of the medical student. If there were no new consults, the remote neurologist spent 30 to 90 minutes teaching about topics relevant to the patients seen that morning. Students reviewed recent publications and articles related to acute neurology care as recommended by the remote faculty. In addition to this supplemental teaching, rural track students participate in the same virtual lecture series, readings, and online patient case materials as main campus students. The required curriculum covers a broad range of acute, chronic, inpatient, and outpatient neurologic topics.

The medical students were responsible for completing daily record notes for each patient seen with the neurologist. This note template, developed by the students, served as a running record of each patient with distinct sections as shown in Table 1. The student completed 2 notes for each patient. The student version was completed as soon after admission as possible and was used for later review with the outpatient neurologist. The second version of the note was for research purposes and included the final summary of imaging results and the assessment and plan of the remote neurologist, which we report here. The student version was considered a catalyst for active learning and allowed for guided practice with critical thinking in the setting of acute neurology care. Immediate feedback on the draft student notes was provided by the on-site nurse practitioner.

Table 1. Daily Record Components
1. Demographics (age, sex, race)
2. Chief complaint
3. Date presented to ED and last time known well
4. Presenting symptoms
5. Medical history, Surgical history, Social history
6. Current medications
7. Allergies
10. Review of symptoms
11. Vitals and Physical exam (neurology exam)
13. Diagnostic studies (labs, imaging, tests)
14. Abnormal results
15. Assessment and Plan

In addition to inpatient clinical experience, medical students commuted 2 to 3 times per week to an outpatient neurology office located one hour away. In this setting, students learned common outpatient complaints and management protocols. Students saw patients in the office where they obtained patient history, performed physical examination, developed an assessment and plan, and presented to the in-person neurologist. Students also wrote notes on patients seen. In addition, students observed common office procedures like electromyography (EMG) and Botulinum toxin injection. The neurologist reviewed the student version of the inpatient daily stroke notes and provided additional feedback to the student.

We summarized demographic and clinical information using frequencies and percentages, with the patient population of 49 as the denominator. Comorbidities were obtained using the patient

problem list as shown in the electronic medical record (EMR) and re-checked using the patient medication lists from EMR. The presenting complaints were the chief complaints provided by the patient on arrival at the emergency department. These were obtained directly from the patient chart or by talking directly with the patient. We measured student satisfaction by having each rotating student complete a series of surveys at the conclusion of their neurology clerkship. The surveys evaluated student satisfaction with the overall rotation experience, as well as an evaluation of teleneurology attending performance and teaching. Direct individual feedback was not sought from patients, but the tele-stroke team leaders provided comments specific to student involvement.

Results

Data from 4 third-year medical students was included in this study. A total of 49 neurology patients were seen by the medical students. The patient population seen by students is described in Table 2 and patient outcomes outlined in Table 3.

Table 2. Patient Population	
Number Patients	49
	Mean (Range)
Age	69 (23-93)
	Frequency (%)
Female	28 (57.1%)
White	48 (98.0%)
Black	1 (2.0%)
Comorbidities	
Hypertension	44 (89.8%)
Hyperlipidemia	44 (89.8%)
Tobacco Users	21 (42.9%)
Diabetes Mellitus Type 2	21 (42.9%)
Coronary Artery Disease	13 (26.5%)
Atrial Fibrillation	8 (16.3%)
Presenting Complaint	
Weakness	29 (59.2%)
Dysarthria	21 (42.9%)
Numbness	8 (16.3%)
Confusion	8 (16.3%)
Visual Field Deficits	7 (14.3%)
Dizziness	7 (14.3%)
Ataxia	5 (10.2%)
Headache	5 (10.2%)
Fall	3 (6.12%)
Facial Droop	2 (4.08%)

Table 3. Patient Outcome Final Diagnosis	Frequency (%)
Infarct	29 (59.2%)
Transient Ischemic Attack	8 (16.4%)
Deficits from prior Cerebrovascular Accident	2 (4.1%)
Complex Migraine	2 (4.1%)
Hypertensive emergency	2 (4.1%)
Metabolic Encephalopathy	2 (4.1%)
Radiculopathy	1 (2.0%)
Conversion disorder	1 (2.0%)
Transient Global Amnesia	1 (2.0%)
Hypoxia (Pneumonia)	1 (2.0%)
Hospital Course	Mean (range)
Length of Stay in acute bed	2 (1-6)
Length of Stay in inpatient Rehabilitation	14 (0-23)
Final Disposition	
Home	24 (49.0%)
Home with Occupational Therapy/Physical Therapy /Speech	17 (34.7%)
Skilled Nursing Facility	6 (12.2%)
Transfer during initial hospital stay	2 (4.1%)

Student evaluation data and comments are summarized in Table 4, along with staff comments. The survey responses were on a Likert scale (strongly disagree -1, disagree -2, neutral 3, agree- 4, strongly agree-5). We combined all student responses to provide the mean response and range.

Table 4. Student Evaluation of the Project	Mean response (range)
Technology was useful for learning.	5 (5)
Remote faculty observation of my exam was helpful.	5 (5)
Interdisciplinary approach was optimal for learning.	5 (5)
Faculty teaching was effective.	4.92 (4-5)
Student's role was appropriate for learning.	4.88 (4-5)
The experience was organized, and expectations were communicated.	4.31 (2-5)
Stroke daily record was useful for learning.	4 (2-5)

Student/Staff Comments

"Faculty 1 had great screen presence and was able to keep everyone involved and interested"

"Faculty 3 had a great screen presence and answered all questions by patients and families."

"Faculty 4 had a very positive presence and in no way over-critical to students."

"Faculty 5 was very approachable and understood the knowledge base of a typical third year student. Faculty 5 recommended several articles which were beneficial with shelf studying. He reviewed 2 articles with me daily and asked great review questions."

"Faculty 3 was extremely enthusiastic about teaching, gave me lectures on stroke, but also other neuro topics that would be helpful for the shelf. Faculty 3 also gave me feedback with each patient, so I knew exactly how I needed to improve. Wonderful teacher."

"Faculty 2 did not attempt to teach. I am not sure if he was unaware that he was supposed to teach. He did not attempt to bring me into each patient's care but did passively allow me to perform the neuro exam in place of the nurse."

"Faculty 1 is very knowledgeable and ecstatic to teach, joy to learn from. Can't speak highly enough."

"Faculty 1 talked through abnormal MRIs, MRAs, CTAs and CT scans and explained when to use with vs without contrast CTs and explained the difference between T1 and T2."

"Faculty 1 expects students to take part in neuro examination on rounds, present patients, and be an active member of the care team."

"Faculty 3 actively included me in new consults, and I was able to see and perform full neuro exams in the ED."

"Faculty 4 asked my input and inquired about my assessment and plan."

"As the first medical student to participate in the teleneurology curriculum I felt like we were still trying to work out the details of how things would work in reality vs. in theory. It did not take long to work out most of those factors. I found the addition of teleneurology inpatient curriculum very helpful to my overall learning of neurology as a discipline. I felt that this portion of the rotation specifically helped me grow in my presentation and physical examination skills, as well as my abilities to work with a large multi-disciplinary team."

"During my rotation, the neurology faculty schedule was in flux and changing constantly (making it hard to get in a routine). Otherwise, neurology via telemedicine has been incredibly enriching. I met all required diagnoses quickly, improved my presentation skills, and perfected my physical examination skills."

"Student involvement has been a positive addition to the team as a whole. Students are learning how to educate patients on stroke care and prevention. In addition, they will be able to identify high risk patients and risk factors. They are a valuable addition to the entire team." – APRN

"Overall, patients are positively impacted by students on the rotation and are extremely receptive to student rotators taking an active role in their care." - APRN

"Having medical students on the teleneurology service was so refreshing and added a new level of intellectual stimulation. The students bring a curiosity and passion for working with the patients. They allow for the entire team to be reminded and refreshed on basic science components through their questions." - PT

"Patients are more than accepting of having medical students as a part of their care team. The students spend quality time listening to the patients, talking with them, and helping to educate the patient. The degree to which students are able to spend with each patient allows for them to act as a valuable liaison between the patient and the team." - PT

With the adapted neurology curriculum for the study time period, students scored 1.5 points higher on the clinical evaluation than did the main campus students and 2.6 points higher on the shelf exam. In this patient group, all but 2 patients received all acute neurologic care and were medically managed within the rural hospital. None of the patients included in this group received thrombolytics because they presented outside of the required time window.

Discussion

The primary goal of implementing teleneurology into the clerkship curriculum was for each student to participate in full scope neurology clinical care. The new curriculum allowed for continued outpatient

experiences, and patient-centered, multidisciplinary approaches to inpatient acute stroke care. The addition of inpatient teleneurology curriculum was well accepted by all participating students. Our survey indicated that all 4 medical students responded "strongly agree" when asked if they were satisfied with telemedicine as a part of their learning experience.

Weakness was the most common presenting symptom of patients seen followed by dysarthria, numbness, and confusion. All of these are common and important presentations for students to understand. Overall, the most frequent diagnosis was cerebral infarction, followed by transient ischemic attacks, and non-stroke diagnoses. Medical students were able to follow patients who initially presented with symptoms suspicious for CVE until diagnosis and disposition. Students were encouraged by telemedicine attendings to create a differential diagnosis, assessment, and plan for each patient. The fact that 95.9% of our patients were able to be cared for in our community hospital where they may know staff and where their family can easily visit speaks to the value to our patient population. The teleneurology service also keeps revenue for acute care in our local hospital, an important concern for all community hospitals.

Each faculty received mostly high marks on student evaluations. Student surveys indicated that remote faculty teaching was considered effective by all medical students. The medical students worked with and evaluated 5 teleneurology physicians. Students commented on certain faculty members taking extra time to explain key neurology concepts and review diagnostic imaging, including information on when to use specific forms of imaging in patient scenarios. This unique form of communication allowed for faculty to provide lectures on stroke, review up to date, evidence-based articles, and give feedback to students on physical exam and topics discussed.

Faculty screen presence was specifically noted by students and contributed to the overall learning experience. In this context, we define screen presence as the ability to connect with and engage the person (colleague, care team member, patient, patient family, or student) with whom one is communicating via telemedicine robot or live video conference. This attribute includes speaking distinctly and allowing for the audio delay to avoid talking over someone. It also includes pausing to recognize persons at the other end and giving them opportunities to contribute without having to interrupt. Student feedback suggested that many of the faculty demonstrated quality screen presence that in turn enhanced the patient's experience and the learning for students. A positive screen presence resulted in improved patient and family engagement by the neurologist and gave the medical student the confidence to perform the neurologic exam and ask questions.

In addition, participation in the multidisciplinary care team provided students with structure and purpose. Our survey indicated that students gained valuable skills by working with other healthcare disciplines on a team. This is an important skill for future physicians that cannot be taught in traditional didactics. Through patient presentation during morning report, medical students were able to demonstrate active knowledge of each patient case. Medical students saw new consults, formulated their own assessments and plans, and received important constructive feedback from teleneurology faculty. In addition to pre-rounds each morning, by acting as the "hands" of the remote neurologist, the medical student held an active role in patient care. Our survey indicated that all medical students were observed directly by the neurologist while completing the full neurology examination.

Enthusiastic interest in teaching, thoughtful screen presence, and high expectations for the student as an essential part of the team were faculty characteristics that resulted in positive learning outcomes for students. Students noted that direct feedback on presentation and exam skills added to the overall educational value.

Overall, the staff who were surveyed remarked that medical students were a positive addition to the care team, and they noted that patients were very accepting of having students be an active part of their care. Most patients appreciated the extra time medical students spent with them and felt that their concerns were heard based on staff observation. Patients were not surveyed, however, based on student and faculty observation the patients and their

families were very receptive to this method of care. The live communication between the patient or family and the teleneurologist was smooth and without delay, almost as if the neurologist were physically in the patient room.

Study Limitations and Strengths

Our study included only 4 students. Two additional medical students were expected to participate during the study period, but the COVID-19 pandemic caused a nation-wide disruption in clinical training for third- and fourth-year medical students. However, the strong similarity of feedback from all 4 students suggests that they are representative of the larger group. The exception was the one student who felt that the organization and the daily stroke record needed improvement. Further discussion with this student showed that many of the details of the teleneurology team were being worked out at the time of her rotation, and the organization of the overall rotation improved as she progressed over the 4-week period. She also provided valuable feedback for improving the daily stroke record to maximize efficiency and learning potential. Lack of continuity between student and remote faculty was cited as an issue by some students. More continuity is always preferred, but the same discontinuity is encountered on most university teaching services, where the team attending may change weekly or even more frequently depending on their other responsibilities.

Although students became very familiar with the requirements and contraindications for thrombolytics in acute stroke symdromes, they had no experience following patients who received them. At our hospital during this time period, very few patients presented during the appropriate time window. This is largely thought to be due to a lack of understanding of common presenting stroke symptoms within the community and the community is still learning about these new capabilities in the hospital. The hospital system is actively trying to educate the community on common signs and symptoms of stroke through informative videos online and radio broadcasts. It was important for students to learn of these obstacles. The hospital is not yet considered a certified stroke center, and the closest certified stroke center is located 48 miles away in Evansville, Indiana.

Identified strengths of the experience include preceptor willingness and enthusiasm for teaching which added to the students' learning experience as preceptors provided excellent feedback and established the student as an integral part of the stroke care team. An important benefit of this process was the ability of the student to participate directly in a multidisciplinary care team. This allowed the student to develop communication and team building skills necessary for quality patient care and success in their future residency training and career.

Conclusion

We conclude that participating students were satisfied with the teleneurology rotation experience and enjoyed learning from remote faculty. Students felt that their learning was more comprehensive with the inclusion of teleneurology in the inpatient setting. In addition, students had an increased confidence in conducting the neurological examination and collaborating as a part of a multidisciplinary team at the conclusion of the rotation. Students expressed increased understanding of telemedicine services and its many uses within the inpatient and outpatient settings. Students expressed overall satisfaction with the daily record as a learning tool to record history, physical exam findings, assessment, and plan.

Students were exposed to a wide variety of common inpatient neurological complaints, diagnostics, and management protocols. All students completing the neurology rotation at our regional campus were able to see all required diagnoses in-person, and the addition of teleneurology technology greatly assisted in student engagement in the direct care of patients with suspected strokes. Telemedicine holds significant promise for medical student education and facilitating access to care for rural and other underserved patient populations. Further research and innovation are needed to optimize the effective use of this technology.

Acknowledgment

We express our sincere appreciation to Steve Fricker, the Director of Rural Health/Student Affairs at the Trover Campus for data base management.

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Class of 2022 with Dr. Bill Crump at Deans Hour engrossed in real time evidence search

Steve Fricker was the Director of Student Affairs for the Trover Campus. Steve retired on May 6, 2022 after 21+ years.

It's a Steve Thing

"How can we find that digital file?"
That's a Steve thing.

"I just got a needle stick. What do I do?"
That's a Steve thing.

"A student got a medical bill. What do we do?"
That's a Steve thing.

"Can we reimburse for cat food?"
That's a Steve thing.

"This student's not listed in New Innovations."
That's a Steve thing.

"This video connection is acting up."
That's a Steve thing.

"I can't get this manuscript submitted."
That's a Steve thing.

"We need to estimate the cost of class size."
That's a Steve thing.

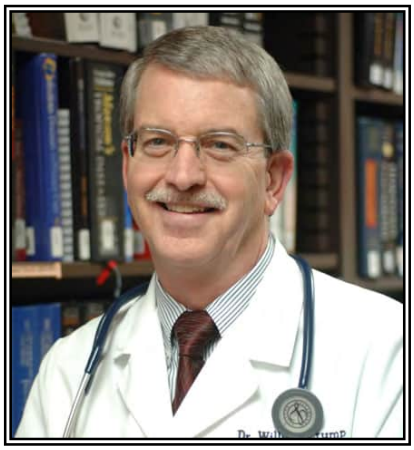
"How could one person wear so many hats?"
It's a Steve thing.
We will miss him immensely.

Bill Crump May 6, 2022

Steve with his wife Jan

Trover Campus

TROVER CAMPUS ADMINISTRATIVE STAFF



Dr. William Crump is Associate Dean of the Trover Campus and Professor of Family and Community Medicine at U of L. A graduate of Vanderbilt Medical School, he completed residency at the University of Alabama in Birmingham and a Faculty Development Fellowship at the University of North Carolina at Chapel Hill. He was a faculty member at the regional campus at Huntsville, Alabama for almost 10 years and Assistant Dean and Director of Rural Programs at the University of Texas Medical Branch in Galveston for almost 6 years prior to his move to Madisonville in 1998. Concerning his activities in Madisonville, Dr. Crump says: "I feel that I've been preparing for this job my entire professional life. It's a challenge I truly enjoy. As I look back on the last 24 years here, it's remarkable how much fun it's been. I am proud of our graduates and working with them has made me a better doctor and teacher."

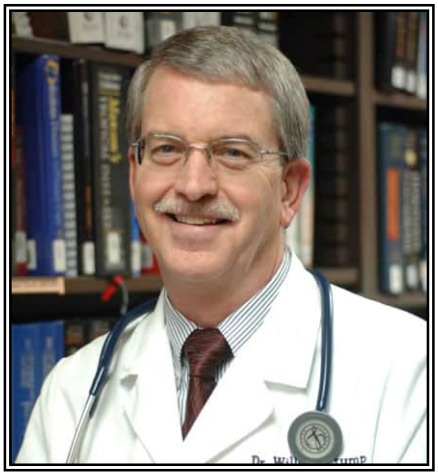
Ms. Pam Carter is the Clinical Student Coordinator for the students that attend the Trover Campus. She provides the primary staff support for the third and fourth year medical students including their clinical rotation schedules, student records and other responsibilities such as this report and presentations that represent our campus. Ms. Carter says: “22 years in the same job speaks for itself. I love working with the students”.

Mrs. Kendall Denny is the Pathways Coordinator for the Trover Campus. She manages all day-to-day aspects for the High School Rural Scholars, College Rural Scholars, Prematriculation, Preclinical programs, our admissions process and our student-led free clinic. She says, “I am so blessed to have been able to come full circle with the U of L Trover Campus. As a former High School Rural Scholar myself, having the privilege of managing the program just puts a smile on my face! I absolutely love that I get to play such an integral part in the beginning of each student’s journey to medical school!”

Baptist Health Madisonville - West Kentucky AHEC

Martha Pleasant, MS serves as the Director of the West Kentucky AHEC. Martha's educational background includes a bachelor's degree in Community Health from Western Kentucky University and a Masters of Science Degree in Human Development and Leadership from Murray State University. Martha was the Educational Programs Coordinator for West AHEC and prior to joining West AHEC she served as the Community Education Coordinator at Regional Medical Center. When reflecting on the work of West AHEC, Martha says, "AHECs are in the unique position to change the health status in western Kentucky by providing continuing education opportunities for healthcare professionals, by facilitating student rotations in rural areas and by promoting health careers to our youth."

CHIEFS OF TEACHING SERVICES



Family Medicine - Dr. Bill Crump acts as the Teaching Chief of Family Medicine at the Trover Campus. Dr. Crump's training is discussed in the "Administrative Staff" section. He continues an active practice including Obstetrics, and teaches both students and residents on the Family Medicine and Obstetrics services. For a generation he has facilitated groups and taught other faculty the iterative process of learning used in problem based learning exercises and while in Galveston trained and validated cases for the standardized patient program. Concerning his teaching role, Dr. Crump says: "We really get to know our students well, and it's fascinating to watch them develop into clinicians over a two-year period."

Internal Medicine - Dr. B.N. Sreekumar is the Teaching Chief of Internal Medicine at the Trover Campus. Dr. Sree earned his M.D. degree from Madras Medical College College in India and completed a residency program in Internal Medicine at Michael Reese Medical Center, University of Illinois, Chicago and a Cardiovascular Medicine fellowship at the University of Missouri, Columbia. Dr. Sree has been in practice since 1995, in Madisonville since 1997, and on the ULTC faculty since 2001. His busy cardiology rotation is a favorite of ULTC students. Dr. Sree says of his teaching at the Trover Campus: ""The Trover campus provides a unique opportunity for our motivated students to learn high quality medicine and insights into complex decision making in a friendly environment. Teaching stimulates me to keep up to date and sharing knowledge enhances the joy of clinical practice."

Neurology - Dr. Nahgma Mufti is the Teaching Chief of Neurology at the Trover Campus. Dr. Mufti obtained her undergraduate and medical degrees from the Khyber Medical College in Peshaswar, Pakistan and completed Residency Programs at the Veterans Affairs Medical Center in Wilkes Barre, Pennsylvania and North Shore University Hospital, New York, where she also completed a Neurology Fellowship. Dr. Mufti has been with the Madisonville campus since 2002. In regard to her teaching role, Dr. Mufti says: "I really enjoy working with the students. When I work with them and teach them, it gives me the stimulus to learn new things.

OB/GYN – Dr. Sarah Fisher is the Teaching Chief of OB/GYN at the Trover Campus. She earned her M.D. degree at the University of Louisville with the clinical years at the Trover Campus. She completed her residency at Geisinger in Danville, PA. Since graduating residency in 2019, she has been practicing in her hometown of Madisonville here at Baptist Health Deaconess Madisonville. With regards to teaching, Dr. Fisher says "Teaching medical students is one of the best parts of my job. Students keep us energized and constantly moving forward to strive for better care that is evidence-based. On the OB/GYN rotation, students can expect to see a diversity of patients in clinic and be involved with surgeries and deliveries."

Pediatrics - Dr. Carey Dodds is the Teaching Chief of Pediatrics at the Trover Campus. Dr. Dodds grew up in Madisonville, earned her M.D. degree from the University of Louisville and completed her residency there as well. She served as a hospitalist at Kosair Children's Hospital and Attending Physician at the Children and Youth Project in Louisville from 2000-2004. In 2004 she moved back to her hometown and became a key part of the ULTC teaching team. Students regularly report that her teaching made a difference for them, both in learning and specialty choice. She took the Chief position in 2011. Describing her teaching activities, Dr. Dodds says "Working with the students keeps you at the top of your game. You must stay up to date on the latest recommendations and be able to provide explanations to the students about your medical decisions."

Psychiatry - Dr. Shabeer Abubucker is the Teaching Chief of Psychiatry at the Trover Campus. He earned his M.D. degree from Medical College of Georgia and completed a residency program in Psychiatry at the Medical College of Georgia. Dr. Abubucker has been in practice since 2007, and in Madisonville and on the ULTC faculty since 2016. His busy Psychiatry rotation is a favorite of ULTC students. Dr. Abubucker says of his teaching at the Trover Campus: "People and their lives are fascinating. The diversity of the human experience is humbling. The Psych rotation gives students an opportunity to be introduced to the diversity of the human experience and to appreciate pain and suffering as well as compassion and healing."

Surgery - Dr. Mohan Rao is the Teaching Chief of Surgery at the Trover Campus. Dr. Rao earned his M.D. degree from the Ohio State University College of Medicine in 1980 and completed his surgery internship and residency at the University of Louisville. He also completed a fellowship in burns and critical care at Cornell University in New York City. Dr. Rao has practiced in Madisonville since 1986 and has been actively involved in surgery education for more than 30 years. He has received numerous teaching awards from the students and residents at the University of Louisville and is a member of the Alpha Omega Alpha society at both Ohio State and the University of Louisville. When discussing the Trover Campus, Dr. Rao says: "The educational program of Trover is a vitally important component of the surgical practice here in Madisonville. Our continued association with enthusiastic and motivated students from the University of Louisville is a privilege and a constant source of our own ongoing education."

ACKNOWLEDGEMENT

Once again we want to recognize the partners in the building of the Trover Campus: Baptist Health Madisonville, the University of Louisville School of Medicine and the West Kentucky AHEC (Area Health Education Center). Each program reviewed in this report is truly a collaborative effort, and all partners deserve credit for the outcomes. A special note of thanks goes to Dr. David Wiegman, former Senior Executive Dean at U of L. Without his and the current ULSOM leadership' untiring efforts on the Louisville campus, the dream of Dr. Loman Trover and others in Madisonville would not have been realized. Likewise, without the strong advocacy provided by many elected officials, the Trover Campus would not exist in its current form. Many dedicated individuals participated in the preparation of this report. Pam Carter produced the excellent graphic summaries and brought it all together in a most readable form.

TROVER CAMPUS STAFF

William J. Crump, M.D., Associate Dean bill.crump@bhsi.com

Pam Carter, M3/M4 Clinical Student Coordinator pam.carter@bhsi.com

Kendall Denny, Pathways Coordinator kendall.denny@bhsi.com

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U of L Trover Campus students in action

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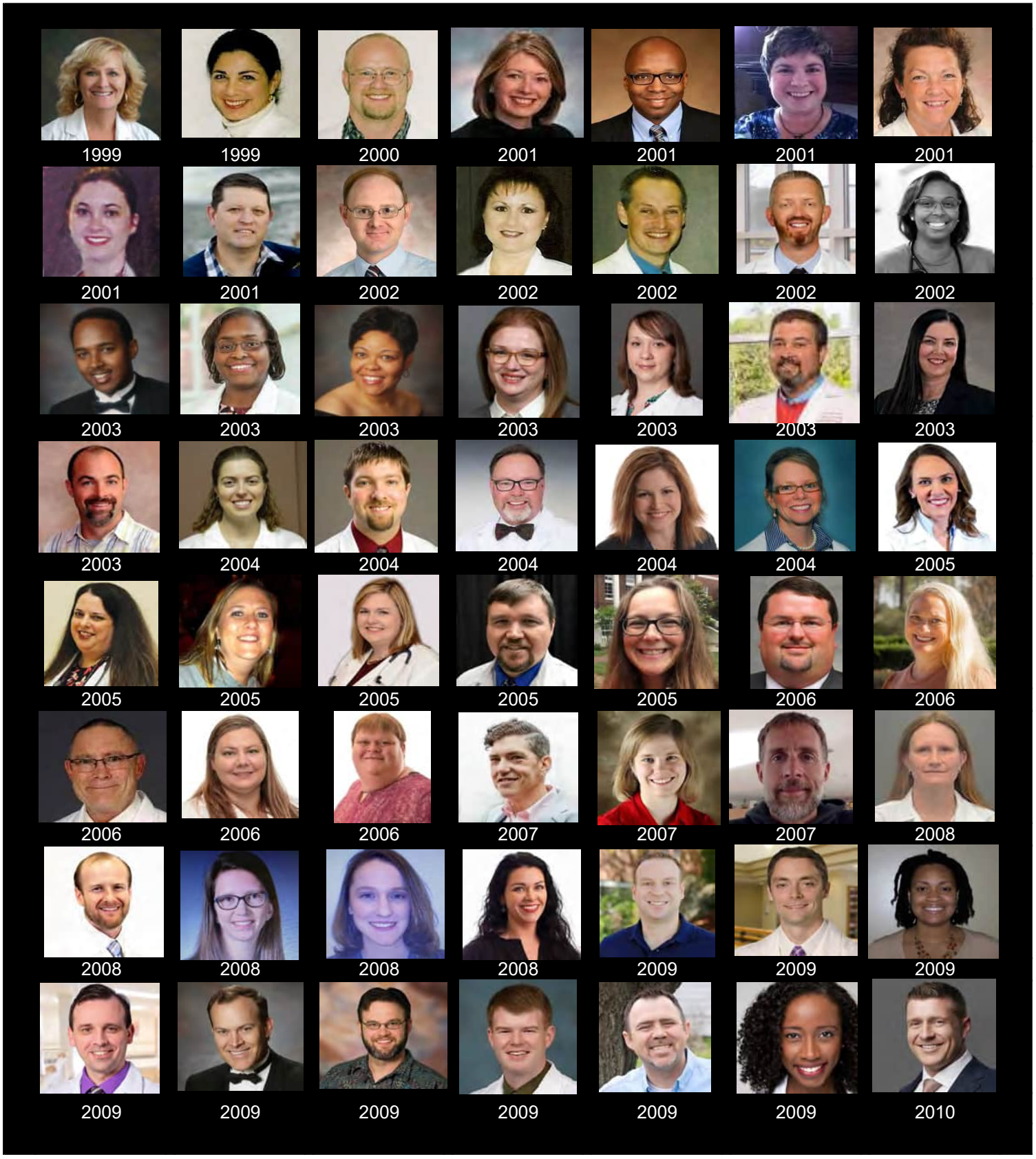
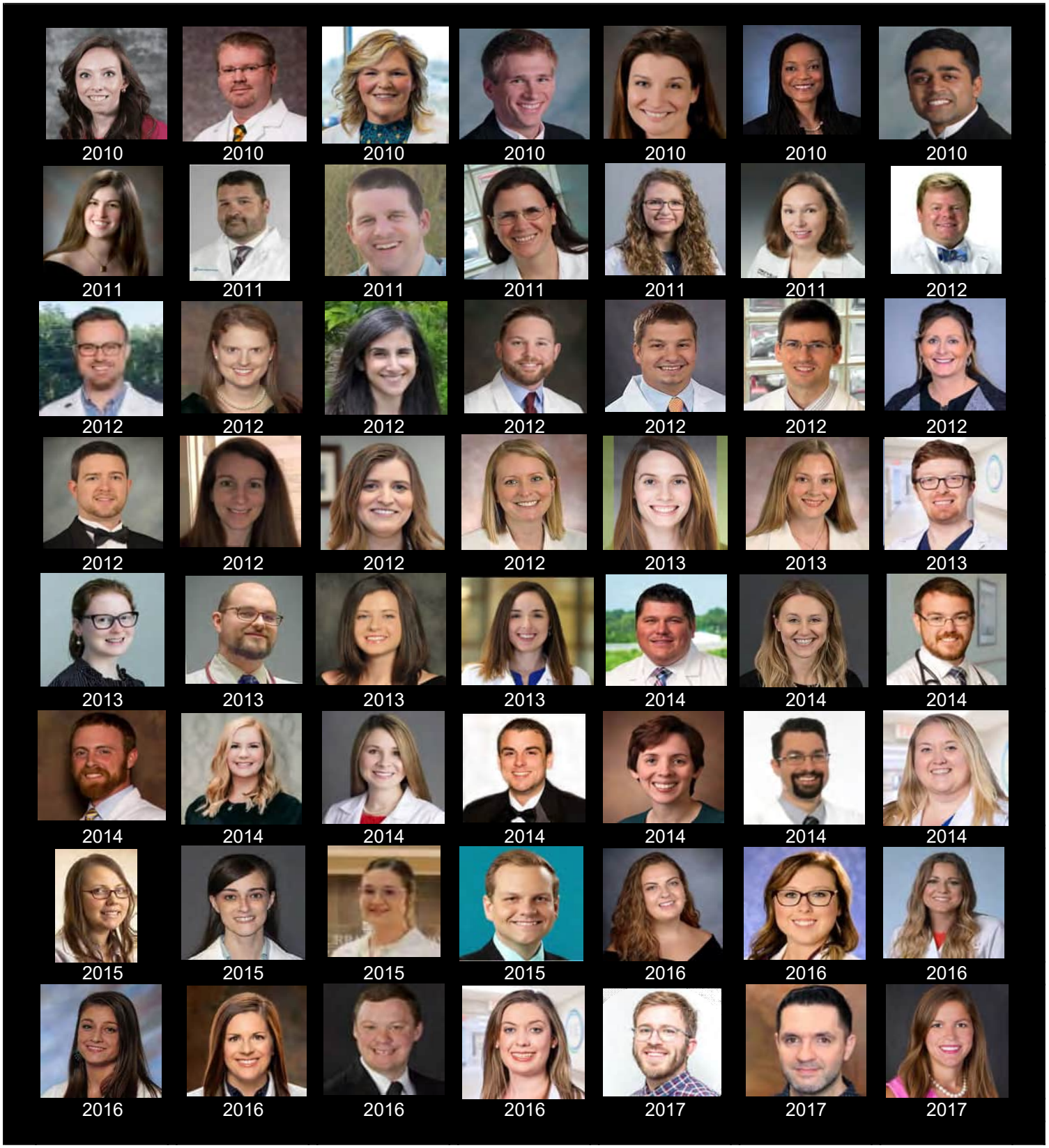
University of Louisville Trover Campus Graduates and current students
(see list on last page for names)



University of Louisville Trover Campus Graduates and current students
(see list on last page for names)



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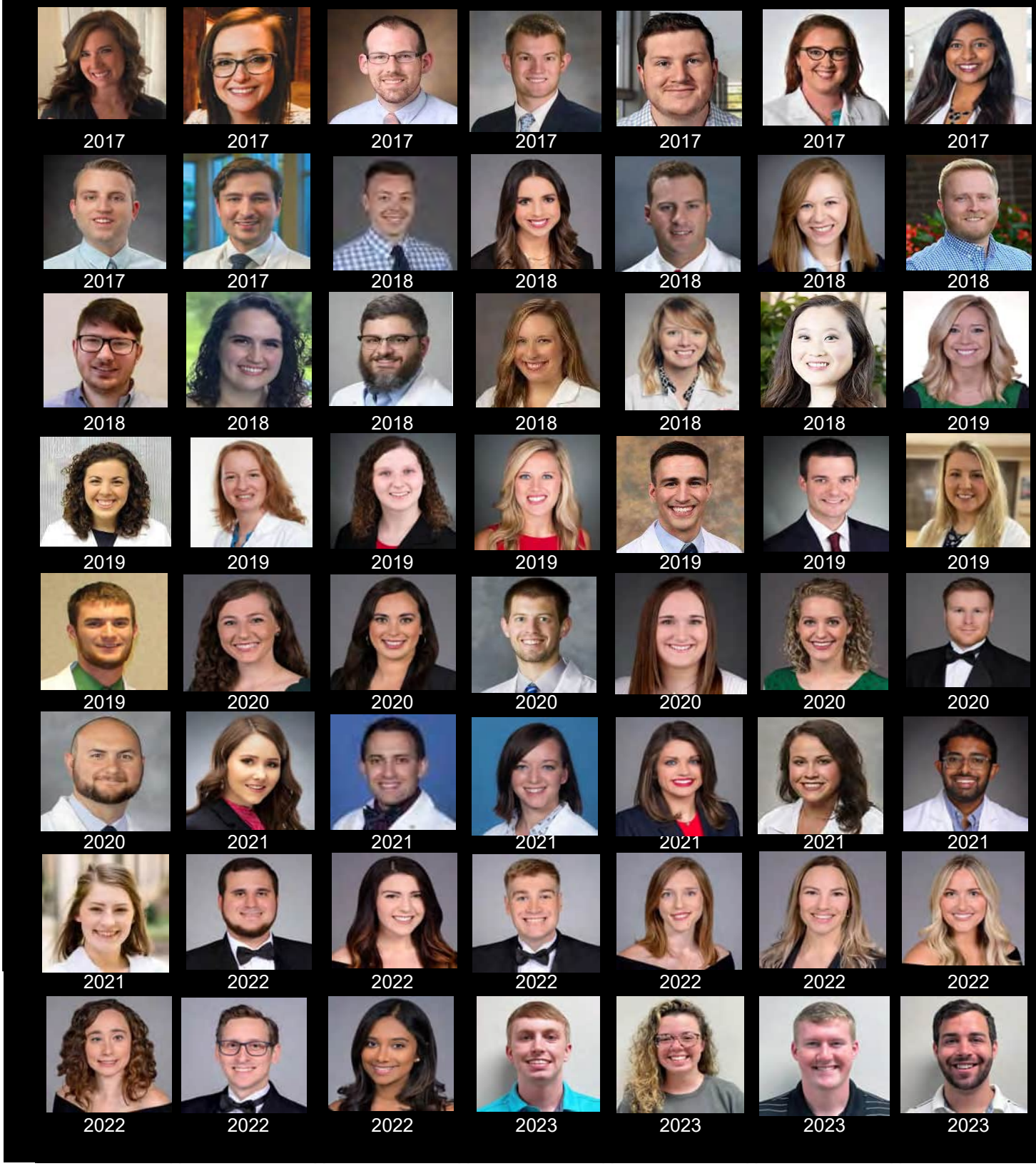
(see list on last page for names)



University of Louisville Trover Campus Graduates and current students
(see list on last page for names)

Page/Row/Position	ULTC Student name		Home County	Year Graduation
1-1-1	Stacey	Fazenbaker	Hopkins	1999
1-1-2	Diana	Stulc	Middlesex (MA)	1999
1-1-3	Allen	Wells	Muhlenberg	2000
1-1-4	Tara McAllister	Easley	Patoka (IN)	2001
1-1-5	Daryl	Green	Ohio	2001
1-1-6	Stacy	Gregory	Bell	2001
1-1-7	Susan	Hagan	Bullitt	2001
1-2-1	Mary	Harkleroad	Warren	2001
1-2-2	Mike	Howard	Perry	2001
1-2-3	David	Catlett	Larue	2002
1-2-4	Sandy	Gilkey	Hopkins	2002
1-2-5	Ken	Payne	Henry	2002
1-2-6	Nick	Sherrow	Garrard	2002
1-2-7	Shevonda	Sherrow	Jefferson	2002
1-3-1	Tedros	Andom	Clay	2003
1-3-2	Antionette	Caldwell	Lorain (OH)	2003
1-3-3	Mildred	Carson	Orangeburg (SC)	2003
1-3-4	Susan	Heffley	Breckenridge	2003
1-3-5	Sarah	Little	Warren	2003
1-3-6	Matthew	Price	Calloway	2003
1-3-7	Karla	Turley	Russell	2003
1-4-1	Kevin	Zent	Jessamine	2003
1-4-2	Michele	Brezinski	Hennepin (MN)	2004
1-4-3	Bernard	Eskridge	Jefferson	2004
1-4-4	Larry	Lawrence	Jefferson	2004
1-4-5	Jessica	Mendel	Nelson	2004
1-4-6	Tanika	Taylor	Jefferson	2004
1-4-7	Amber Hurt	Chambers	Barren	2005
1-5-1	Hope	Henson	Casey	2005
1-5-2	Allison	Hunt	Taylor	2005
1-5-3	Tara	Newsome	Floyd	2005
1-5-4	Jeremy	Parsons	Floyd	2005
1-5-5	Toni	Parsons	Pike	2005
1-5-6	Darel	Barnett	Hopkins	2006
1-5-7	Aimee	Bohn	Greenup	2006
1-6-1	John	Holeman	Union	2006
1-6-2	Carrie	Huber	Marion	2006
1-6-3	Bethany	Lucas	Greenup	2006
1-6-4	Brad	Collins	Johnson	2007
1-6-5	Bethany	Crispin	Boone	2007
1-6-6	Crosby	Rechtin	Campbell	2007
1-6-7	Sara Huss	Aboelsaad	Mason	2008
1-7-1	Dustin	Campbell	Perry	2008
1-7-2	Erin	Johnson	Carroll	2008
1-7-3	Emily	Kenner	Hardin	2008
1-7-4	Suzanne	McGehee	Perry	2008
1-7-5	Jonathan	Ballard	Muhlenberg	2009
1-7-6	Clay	Davis	Muhlenberg	2009
1-7-7	Gabrielle	Grundy	Washington	2009
1-8-1	Joshua	Kitchens	Fulton	2009
1-8-2	Paul	Quertermous	Daviess	2009
1-8-3	Channing	Slate	Hopkins	2009
1-8-4	Matt	Smith	Christian	2009

Page/Row/Position	ULTC Student name		Home County	Year Graduation
1-8-5	Chris	Sperry	Webster	2009
1-8-6	Candace Lane	Walker	Cobb (GA)	2009
1-8-7	Ryan	Beck	Marshall	2010
2-1-1	Melissa	Camiolo	Oldham	2010
2-1-2	Brad	Hughes	McLean	2010
2-1-3	Marissa Stewart	Jaynes	Trigg	2010
2-1-4	Matt	Kelleher	Calloway	2010
2-1-5	Anna Uebele	Pierce	Brown (WI)	2010
2-1-6	Tia	Robertson	Richmond (GA)	2010
2-1-7	Uttam	Shastri	Jefferson	2010
2-2-1	Alissa	Daugherty	Christian	2011
2-2-2	Justin	Hunsucker	Carter	2011
2-2-3	Brandon	Lancaster	Muhlenberg	2011
2-2-4	Elizabeth	Matera	Muhlenberg	2011
2-2-5	Amy Law	Patterson	Simpson	2011
2-2-6	Hayley	Trimble	Johnson	2011
2-2-7	Jack	Arnold	Harrison	2012
2-3-1	Heath	Cates	Marshall	2012
2-3-2	Julie	Davenport	Calloway	2012
2-3-3	Nina Faghri	Lecompte	Jefferson	2012
2-3-4	Isaac	Miller	Grayson	2012
2-3-5	Jesse	Miller	Graves	2012
2-3-6	Tom	Newcomb	Rowan	2012
2-3-7	Katie	Pohlgeers	Kenton	2012
2-4-1	Steven	Roby	Daviess	2012
2-4-2	Allison Crump	Rogers	Hopkins	2012
2-4-3	Megan	Settle	Hopkins	2012
2-4-4	Tiffany	Simpson	Hopkins	2012
2-4-5	Amanda Lewis	Brown	Calloway	2013
2-4-6	Kimberly	Case	Shelby	2013
2-4-7	Reagan	Gilley	Bell	2013
2-5-1	Whitney Talbot	Gilley	Jefferson	2013
2-5-2	Scott	Howard	Knott	2013
2-5-3	Natalie	Pettit	Fleming	2013
2-5-4	Amanda	Wood	McCracken	2013
2-5-5	Austin	Beck	Marshall	2014
2-5-6	Emily	Cottrell	Grant	2014
2-5-7	Adam	Craig	Muhlenberg	2014
2-6-1	Chris	Ethridge	McCracken	2014
2-6-2	Audra Isaac	Grossman	Harrison	2014
2-6-3	Ashley Flanary (RMAT)	Jessup*	Marshall	2014
2-6-4	Jonathan	Moore	Nelson	2014
2-6-5	Katelyn	Neely	Hopkins	2014
2-6-6	Clay	Williams	Jefferson	2014
2-6-7	Sarah	Fisher	Hopkins	2015
2-7-1	Jessica Wood	Ison	Whitley	2015
2-7-2	Makinzie	Mott	Marshall	2015
2-7-3	Myra Irvin	Rowe	Calloway	2015
2-7-4	Travis	Wheeler	Mason	2015
2-7-5	Hannah	Bennett	Green	2016
2-7-6	Victoria Wilson	Edwards	McLean	2016
2-7-7	Katelyn Fulcher	Flick	Henderson	2016
2-8-1	Kathreina	Greenwell	Bullitt	2016

Page/Row/Position	ULTC Student name		Home County	Year Graduation
2-8-2	Kelsey Willen	Malloy	Christian	2016
2-8-3	Josh	Scearce	Perry	2016
2-8-4	Kristin Gerwe	Wickham	Hopkins	2016
2-8-5	Corey	Cox	Pike	2017
2-8-6	James Kyle	Damron	Calloway	2017
2-8-7	Elizabeth Tarter (RMAT)	Gerlach*	Hart	2017
2-9-1	Rachel Evans	Green	Perry	2017
2-9-2	Samantha	Hays	Jackson	2017
2-9-3	McKinley	Heflin	McLean	2017
2-9-4	Ross	Hempel	Boyle	2017
2-9-5	Ryan	Hicks	McLean	2017
2-9-6	Mary Saylor (RMAT)	Joenborg*	Rockcastle	2017
2-9-7	Rebecca	Raj	Calloway	2017
3-1-1	Andrew	Smith	Graves	2017
3-1-2	Jeremy	Webb	Warren	2017
3-1-3	Collin	Gamble	Owen	2018
3-1-4	Lindsay Highbaugh	Gamble	Hart	2018
3-1-5	William	Hunt	McCracken	2018
3-1-6	Lauren	Logan	Woodford	2018
3-1-7	Kaleb	Moore	Muhlenberg	2018
3-2-1	Joshua	Napier	Henderson	2018
3-2-2	Suzanne Scott	O'Nan	Henderson	2018
3-2-3	Trent	Pierson	Union	2018
3-2-4	Annilin	Severns	McCracken	2018
3-2-5	Amber	Shadoan*	Pulaski	2018
3-2-6	Carli	Whittington	Hopkins	2018
3-2-7	Sydni	Crowell	Hopkins	2019
3-3-1	Sarah	England	Woodford	2019
3-3-2	Shannon	Foster	Christian	2019
3-3-3	Karie	Jeter	Metcalfe	2019
3-3-4	Ellie (RMAT)	Jolly*	Trigg	2019
3-3-5	Drew	Kelleher	Calloway	2019
3-3-6	John	Locke	Marshall	2019
3-3-7	Samantha	Mullins	Graves	2019
3-4-1	Ethan	Walker	Marshall	2019
3-4-2	April	Butler	McCracken	2020
3-4-3	Ali	Farris	McCracken	2020
3-4-4	Karl	Hempel	Boyle	2020
3-4-5	Kaitlyn	Hounshell	Fayette	2020
3-4-6	Claire Crawford	Jones	Grayson	2020
3-4-7	John	Saylor	Rockcastle	2020
3-5-1	Tyler	Smith	Muhlenberg	2020
3-5-2	Anne-Taylor	Beck	Muhlenberg	2021
3-5-3	Leeandra	Cleaver	Calloway	2021
3-5-4	Josh	Clark-Fuqua	Marshall	2021
3-5-5	Kaitlyn	Clark-Fuqua	Logan	2021
3-5-6	Paige	Hart	Caldwell	2021
3-5-7	Rohit	Nair	Hopkins	2021
3-6-1	Rebecca Bolinger	Whitworth	Knox	2021
3-6-2	Matthew	Barber	Johnson	2022
3-6-3	Shalyn	Carter	Bath	2022
3-6-4	Devin	Clark	Crittenden	2022
3-6-5	Allison	Engelbrecht	Rowan	2022

Page/Row/Position	ULTC Student name		Home County	Year Graduation
3-6-6	Susan	Hart	Calloway	2022
3-6-7	Talitha	Jones	Woodford	2022
3-7-1	Sarah	Parker	Calloway	2022
3-7-2	Cody	Tucker	Marshall	2022
3-7-3	Sravya	Veligandla	Pulaski	2022
3-7-4	Ashton	Ausbrooks	Warren	2023
3-7-5	Alyssa	Hounshell	Breathitt	2023
3-7-6	Micah	Kaiser	Meade	2023
3-7-7	William	King	Meade	2023
4-1-1	Chelsea	Lancaster	Meade	2023
4-1-2	Jonathan	Smith	Nelson	2023
4-1-3	Kathleen	Wilmes	Daviess	2023
4-1-4	Kennedy	Breeding	Letcher	2024
4-1-5	Emma	Doyle	Barren	2024
4-1-6	Blake	Edmonson	Trigg	2024
4-1-7	Jacob	Lawson	Whitley	2024
4-2-1	Taryn Roby	Miracle	Nelson	2024
4-2-2	Maria	Shields	Nelson	2024
4-2-3	Nicholas 'Tate'	Burris	Hopkins	2025
4-2-4	Drew	Dodds	Hopkins	2025
4-2-5	Elizabeth	Lyons	Boyle	2025
4-2-6	Hannah	Marshall	Simpson	2025
4-2-7	Nita	Nair	Hopkins	2025
4-3-1	Emily 'Caitlan' (RMAT)	Short*	Muhlenberg	2025
4-3-2	Tanner	Smith	Graves	2025
4-3-3	Summer	Sparks	Muhlenberg	2025
4-3-4	James Bradley RMAT	Watson*	Nelson	2025
4-3-5	Cierra	Woodcock	Edmonson	2025
4-3-6	Emily	Amyx	Rockcastle	2026
4-3-7	Meghan	Cawood	Elkhart Co (IN)	2026
4-4-1	Matthew	Collard	Meade	2026
4-4-2	John	Davis	Union	2026
4-4-3	Riley	Eriksen	Hart	2026
4-4-4	Taylen	Henry	Marshall	2026
4-4-5	Shaina	Magness	Graves	2026
4-4-6	Hannah	Newberry	Ballard	2026
4-4-7	Elaina	Perry	Caroll Co (MD)	2026
4-5-1	Rafael	Roberts	Pulaski	2026

*Student participated in (or currently in) RMAT (Rural Medicine Accelerated Track)