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## Do Regional Medical Campuses Contribute to the Production of General Surgeons? A Study of 789 Medical School Graduates from 3 Campuses Who Matched into General Surgery Residencies over 40 Years: 1974 to 2015

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### Abstract

#### Background

A Regional Medical Campus (RMC) is a medical school campus separate from the main medical school at which a portion of pre-clinical or clinical training of medical students is carried out. The College of Community Health Sciences of The University of Alabama in Tuscaloosa, Alabama is the Tuscaloosa Regional Campus of the University of Alabama School of Medicine (UASOM). The question we sought to answer with this study is whether or not regional campuses produce general surgeons.

#### Design, Setting and Participants

Publicly available data for 6271 graduates of the University of Alabama School of Medicine from the Birmingham, Tuscaloosa and Huntsville campuses from 1974 to 2015 was obtained by using Google Search Engine. The list was expanded to include the data described by the variables in Table 1.

#### Results

Between 1974 and 2015, 789 graduates of the University of Alabama School of Medicine assigned to the Birmingham, Tuscaloosa and Huntsville Campuses matched into Categorical Surgery. All three campuses matched similar percentages of students ranging from 10.4% to 13.3% (Table 2). The main campus at Birmingham matched 599 medical students into general surgery and 202 practice general surgery. The Tuscaloosa Regional Campus matched 88 medical students into general surgery and 47 practice general surgery. The Huntsville Regional Campus matched 103 medical students into general surgery and 41 practice general surgery (Table 2).

#### Conclusions

A comparable percentage of medical students at each campus matched into general surgery. The main campus contributed a larger absolute number of practicing general surgeons while regional medical campuses contributed a higher percentage of practicing general surgeons. Regional medical campuses contribute significantly to the deficit of general surgeons in this country.

#### Introduction

A regional medical campus (RMC) is a medical school campus separate from the main medical school at which a portion of pre-clinical or clinical training of medical students is performed. RMCs take on a variety of configurations, and may provide from one to four years of basic science and/or clinical training for either rotating students or for a cohort assigned to that campus for all rotations. The most common

residents and family medicine/specialty fellows, all with a focus on rural, underserved communities of Alabama and the region (2).

Many medical schools have expanded using regional medical campuses to address the predicted shortage of primary care physicians, especially in rural, underserved areas (2, 3). As of 2013, 55 medical schools in the United States and Canada

model for a RMC is one that focuses on the clinical training in the 3rd and 4th years (1, 2). The College of Community Health Sciences of The University of Alabama in Tuscaloosa, Alabama is the Tuscaloosa Regional Campus of the University of Alabama School of Medicine (UASOM), whose main campus is in Birmingham, Alabama. The College was founded in 1972 principally to address the need for family physicians in rural Alabama. It continues to train medical students in their clinical years, family medicine have produced 111 regional medical campuses (1, 4). Regional campuses may be a key strategy to continue the effort to address the primary care workforce shortages (2). But, do regional medical campuses contribute to the production of general surgeons which we are desperately short of in addition to primary care physicians?

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There is a critical shortage of general surgeons in the United States (5-21). This deficit especially affects rural hospitals where the lack of surgery services threatens the hospital's survival (5-9). The number of practicing general surgeons has decreased over the last three decades with a 26% decrease in the last 25 years (5-21). Approximately, 80% of graduating chief residents in general surgery pursue fellowship training for a variety of reasons, leaving only 20% or about 200 surgeons to practice general surgery nationwide (19). This study sought to determine the extent to which regional medical campuses in the UASOM system contribute to the production of general surgeons. Since the Montgomery Campus only opened to medical students in 2014, it was not included in the study.

### Design, Setting and Participants

This study was approved by the Institutional Review Board of The University of Alabama. Financial support was provided by The University of Alabama Institute for Rural Health Research. A list of 6,271 graduates of the University of Alabama School of Medicine from the Birmingham, Tuscaloosa, and Huntsville campuses from 1974 to 2015 was obtained from the published records of the main campus in Birmingham. Graduates assigned to the Montgomery Campus were not included since this campus opened only recently. This list contained the years of matriculation and graduation, full names, specialty choice, name and location of PGY1 institution, and name and location of residency. This database was expanded to include the additional information listed in Table 1. Information sources were primarily identified using Google search engine. Publicly available data from internet sources was selected as the primary source of information, with verification from other sources when feasible. The investigators recognize the positives as well as the limitations of internet-based data. Information was obtained for 6,238 (99.5%) graduates assigned to the three campuses from 1974 to 2015. Physicians were identified by their practice website. The data were then configured into a SPSS database for the purpose of producing descriptive statistics.

This study included graduates who matched into General or Categorical Surgery but changed into another specialty, were dismissed, left medicine altogether, specialized early into an integrated program or completed general surgery followed by a subspecialty fellowship and practiced a surgical subspecialty. Graduates who matched into non-5 year categorical positions (i.e. one year of surgery before ENT) were not included.

### Results

Between 1974 and 2015, 789 graduates of the University of Alabama School of Medicine assigned to the Birmingham, Tuscaloosa and Huntsville Campuses matched into Categorical Surgery. Over the 40 years studied, all three campuses matched comparable percentages of students ranging from 10.4% to 13.3% (Table 2). The main campus at Birmingham matched 599 medical students into general surgery and 202 (35.1%) of the 572 residents who have completed residency training practice general surgery. The Tuscaloosa Regional Campus matched 88 medical students into general surgery and 47 (59.5%) of the 79 residents who have completed residency training practice general surgery. At the Huntsville Regional Campus, 103 medical students matched into general surgery and 41 (46.0%) of the 89 residents who had completed training practice general surgery (Table 2). The study only included surgery clerkship data from the Tuscaloosa Regional Campus.

### Conclusions

A similar percentage of medical students at each campus matched into general surgery. The main campus contributed a larger final number of practicing general surgeons while regional medical campuses contributed a higher percentage of practicing general surgeons. The higher percentage of production of practicing general surgeons at the Tuscaloosa Regional Campus is likely related to the high quality and excellent ratings of the surgery clerkship which has been a favorite among students for many years. Student evaluations list outstanding teachers, more hands-on, first assist experience and more variety (20). Lectures were described as excellent. The course director was receptive to student concerns. One large surgery group has a surgeons' assistant who takes a very active role in teaching students and was described as very helpful.

Mentoring is the primary reason that this clerkship is popular. Small groups for those interested in surgery are important. There is also a lot of student involvement in patient care. There are no surgery residents except for a single trauma surgery resident from a nearby surgery residency. Medical students get to be the first assistant on most operations. Most of the teaching is one-on-one. The Tuscaloosa Regional Campus Surgery Clerkship Director (AGH) spends considerable time counseling medical students interested in a surgery career. The director also strongly encourages students to rotate or do an Acting Internship at a teaching institution that has a general surgery residency, preferably an academic one. Students are also exposed to private- practice general surgeons. Third year clerkships enhance the choice of residency and career (21). Surgery clerkships can enhance a career in general surgery (21).

**Table 1: Expanded Database of Tuscaloosa Regional Campus of the University of Alabama School of Medicine Graduates (1974-2015)**

Matriculation Year	Zip Code
Graduation Year	RUCA Code
MD Granted Date	Rural/Urban Area
Full Name	MUC (Medically Underserved Community)
PGY1 Specialty	Board Certification
PGY1 Institution	Matched in Categorical Surgery
PGY1 City	Matched in Preliminary Surgery
PGY1 State	Practiced General Surgery
Training State to Practice State	Practiced General Surgery in Alabama
Practicing Specialty	Practiced General Surgery in Rural Alabama
Subspecialty	Practiced General Surgery in Rural U.S.
Rural Medical Scholars Program	Matched in Subspecialty Surgery
Primary Care/Other	Matched in Family Medicine
Practicing Matched Specialty	Practiced Family Medicine in Alabama
Practice Location	Practiced Family Medicine in Rural Alabama
Practice State	Practice Primary Care
Address	Practiced Primary Care in Alabama
Contact Telephone	Practiced Primary Care in Rural Alabama
Stayed in Alabama/Left Alabama	

**Table 2: Students Matching into and Practicing General Surgery 1974-2015**

	Birmingham	Tuscaloosa	Huntsville	Totals
Medical Students Matching in General Surgery	599	88	103	790
Students in study per campus	4498	850	923	
% matching into general surgery	13.3%	10.4%	11.2%	
Residents still in surgery training	27	9	14	50
Residents who have completed training	572	79	89	740
Graduates Practicing General Surgery	202	47	41	290
% practicing general surgery	35.1%	59.5%	46.0%	39.2%

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