

# Nonclinical, Observational Trauma Rotations in the United States provide International Students Multidisciplinary Trauma Program and Systems Education

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## ABSTRACT

**Aim:** To create a non-clinical care education alternative for low-middle-income country (LMIC) medical students in an acute care surgery (ACS) service in the United States.

**Materials and methods:** An observational 30-day rotation with retrospective evaluation for an international medical student occurred at a level one trauma center in the United States. Trauma morning report was used as an educational model based on some elements of the American College of Surgeons Committee on Trauma, Resources for Optimal Care of the Injured.

**Results:** Trauma morning report was held daily for the student's 30-day experience. The trauma patients' primary and secondary survey, images, trauma bay, and operative management were all reviewed daily. Patients' prehospital and hospital courses were completely evaluated by the performance improvement team. The functional status, physical therapy, familial support networks, economic and health insurance record, and rehabilitation disposition were reviewed. Prior to discharge, socioeconomic barrier analysis was conducted to provide safe outpatient care plans. Education by attending surgeons for the multidisciplinary team, which was integrated by students, residents, fellows, faculty, social workers, physical therapists, advanced nurse practitioners, performance improvement coordinator, and nurse trauma manager, was conducted daily on a selected topic.

**Conclusion:** Trauma morning report served as an observational education in multidisciplinary trauma systems (TS) for international students. The experience in the United States provides a new perspective on systems-based trauma care for international students.

**Clinical significance:** The educational alternative exposed is a pathway for medical students from LMIC to increase their clinical experience, ACS knowledge, and trauma care system-based understanding. The students who opt for this kind of experience may choose a specialization in surgery, increase their research productivity, and improve the development of

emergency medical services TS in their respective countries.

**Keywords:** Acute care surgery education, Emergency medical services, Global health, International experience, Low-middle-income countries, Medical, Observational study, Students, Trauma systems development.

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## RESUMEN

**Objetivo:** Construir una alternativa de educación para estudiantes de los países de medianos y bajos ingresos (LMIC) mediante una rotación clínica tipo observador (sin contacto directo con el paciente) a través de un servicio de cirugía de emergencia en los Estados Unidos de América (USA).

**Materiales y métodos:** Un estudiante internacional realizó una rotación tipo observador durante 30 días en un hospital de trauma de primer nivel en USA, donde los reportes de trauma matutinos fueron empleados como modelo de educación, basado en las directrices del comité de trauma del colegio americano de cirugía, la experiencia fue evaluada al final de manera retrospectiva.

**Resultados:** Los reportes de trauma matutinos fueron presenciados a diario por el estudiante durante la experiencia de 30 días. En estas reuniones se revisó diariamente la valoración primaria y secundaria del paciente traumatizado así como las imágenes diagnósticas y el manejo inicial en la bahía de trauma y el manejo quirúrgico que cada paciente recibió, también se evaluó por el equipo de mejoramiento del desempeño lo ocurrido antes de llegar al hospital y la estancia intrahospitalaria. Al momento del alta, la funcionalidad, el requerimiento de terapia física, la red de soporte familiar, el estado económico y el registro del seguro médico así como las barreras socioeconómicas fueron analizados e integrados para proveer un plan de atención ambulatorio seguro para cada paciente.

Finalmente cada reunión culminaba con la revisión de un tema en específico llevado a cabo por el cirujano de trauma en turno, para todo el equipo multidisciplinario compuesto por estudiantes de medicina, residentes, fellows, demás cirujanos de trauma, trabajadores sociales, fisioterapeutas, enfermeras practicantes, coordinador de mejoramiento del desempeño y la enfermera gerente del servicio de trauma.

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**Conclusión:** El reporte matutino de trauma puede ser usado como modelo de educación observacional de los sistemas multidisciplinarios de trauma para los estudiantes internacionales, conjuntamente la experiencia en USA le provee a estos estudiantes una nueva perspectiva respecto a la atención del trauma basada en sistemas integrados.

**Significancia clínica:** La alternativa en educación expuesta, es una forma por la cual los estudiantes de medicina de los países de medianos- bajos ingresos pueden complementar su experiencia clínica, los conocimientos en la atención de las patologías quirúrgicas agudas, la comprensión de la atención del trauma basada en un sistema integrado. Los estudiantes que escojan llevar a cabo una experiencia de este tipo podrían en el futuro escoger el área quirúrgica como especialización, a la vez que su productividad en investigación puede verse incrementada, como también podrían mejorar el desarrollo de los sistemas de emergencia y sistemas de trauma en sus países de origen.

**Palabras clave:** Educación medica internacional, cirugía de emergencia, sistemas de atención de trauma.

## INTRODUCTION

Global academic partnerships in surgery are expanding worldwide.<sup>1-6</sup> Students from the United States report their international clinical experiences, but little has been written about international students' experience in US trauma programs. Given the current US policies restricting international students from practicing direct clinical care,<sup>7</sup> an observership rotation introducing trauma systems (TS) to international students was initiated as an alternative. These kinds of experiences are useful to help medical students to model their professional profile and narrow their specialization choices,<sup>8</sup> with a probable increment in research productivity in the field that was stimulated by experience.<sup>9</sup> Acute care surgery (ACS) models in US Departments of Surgery are implemented at major Latin America academic institutions and fellowships. Medical students participate clinically at the few programs that exist, and have an opportunity to attend national and Latin American society conferences. However, medical education internationally needs development to prepare for the TS development necessary within the ACS divisions. The US trauma programs within ACS models follow systems elements to organize a multidisciplinary care of the injured. As surgical systems in Latin America become a focus of domestic academic faculty, little formal education on surgical systems structure in trauma exists for the next generation of academic surgeons in the region. As American students, residents, trainees, and faculty have participated in international exchanges in Latin America, systems education in US trauma programs provides a valuable construct for experience in TS different from current domestic opportunities. This is an important academic endeavor as the Latin American burden in injury and trauma continues because of systems underdevelopment at national levels.

## MATERIALS AND METHODS

A nonclinical TS observational rotation was granted to an international senior medical student from the Universidad de la Sabana, Chia, Colombia. It occurred at a trauma center with Level One American College of Surgeons designation. Before the rotation began, the student applied to the Office of Global Health and the ACS Division. The host university hospital and the visiting international student and medical school required Health Insurance Portability and Accountability Act (HIPAA)<sup>10</sup> and the Federal Emergency Medical Treatment and Labor Act (EMTALA)<sup>11</sup> certification completion. The student secured an opportunity in the United States under a B1 tourist visa permit for a total 30-day experience in multidisciplinary trauma program and systems elements recommended by the American College of Surgeons Committee on Trauma (ACSCOT).<sup>12,13</sup> The observational benefits were retrospectively evaluated for a 30-day experience.

## RESULTS

Trauma morning report was held daily for the student's 30-day experience. In the observation of ACSCOT, the international student learned unique principles in trauma patients' and programs' prehospital, hospital, and discharge activities including clinical and surgical care, physical therapy, occupational therapy, social services, financial/insurance applications, performance improvement, trauma registry, and injury prevention. Advanced Trauma Life Support (ATLS)-based primary and secondary survey, imaging, trauma bay, and operative indications were observed for 113 activations. The student participated in performance improvement teams' prehospital and interhospital processes in mortality conference-based loop closure and clinical practice guideline development for Massive Transfusion Protocol and solid organ injury management. The Department of Surgery's Surgical Morbidity and Mortality conference and grand rounds also provided subspecialty educational context. Education led by attending surgeons for surgery clerkship students, surgical residents, ACS fellows, and other members of the multidisciplinary team covered selected topics in spine injury, pelvic fracture, penetrating neck injury, head injury, gunshot wounds, and anatomical landmarks. The international student was integrated into a team of students, residents, fellows, faculty, social workers, physical therapists, advanced nurse practitioners, performance improvement coordinator, and nurse trauma manager. The experience led to better conceptualization of interprofessional and multidisciplinary US trauma programs and systems.

## DISCUSSION

In a review of the development of TS in the low-middle-income country (LMIC), varying organization of emergency

medical services (EMS) and TS was found.<sup>14</sup> The diversity in these results is based on the cultural and socioeconomic differences between the countries, also showing that economic stress is the main barrier to implement high-income country models of EMS and TS in the LMIC.<sup>14</sup> The education and certificated trauma and emergency medicine training is a repetitive component of the EMS improvement strategies proposed in the LMIC.<sup>14</sup> Studies of EMS trauma students' "hand-off" experiences in the care of injured within trauma programs, where medical students rotated with emergency medical technicians, resulted in an improvement of the student's confidence and patient care skills.<sup>15</sup> Clinical observational experience comprising of trauma resuscitation; surgical procedures; ACS consult evaluations; intensive care unit; and ward in company with general surgery residents, ACS fellows, and in-house surgical attending physicians stimulated the students who participate in these experiences to pursue general surgery residency.<sup>8</sup> Students who participate in a trauma research program were found to exhibit an incremental increase in the interest to enter the surgical field, while also improving research productivity.<sup>9</sup>

International medical student exchange programs in clinical practice have shown to improve medical students' history-taking and physical exam skills.<sup>16-18</sup> However, they are predominantly in a transnational North-to-South direction.<sup>17</sup> It is critical at this time that the United States reverse this predominance and balance a South-to-North transnational experience in education within US practice of multidisciplinary systems-based trauma care, i.e., not readily available in other reported international student experiences.<sup>19</sup> The components of surgical burden in the LMIC<sup>20</sup> include surgical systems under development, and if international medical schools and students from LMICs are offered opportunities to participate in systems rotations concluded to be beneficial, both may play an important developmental role in policy emphasis to accelerate the improvement and development of such programs for domestic EMS and TS processes.<sup>12,13</sup> This is very timely as more formal educational structure and medical student opportunity in surgery and injury are needed to meet 2030 Lancet Commission of Global Surgery goals.<sup>20</sup>

## CONCLUSION

Nonclinical trauma morning report and rotation served as a nonclinical observational education in multidisciplinary trauma program and systems for international students. The experience in the United States provides a new perspective on systems-based care in trauma, i.e., not readily available for all international students. A simple approach to trauma program and systems education is introduced.

## CLINICAL SIGNIFICANCE

The educational alternative exposed is a pathway that can be used by the medical students from LMIC to broaden their clinical perspective, ACS model knowledge, and do so all in the context of TS-based understanding. The students who opt for this kind of experience may choose a specialization in surgery, increase systems research capacity, and develop emergency medical and TS in Latin America.

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### **Nonclinical, Observational Trauma Rotations in the United States provide International Students Multidisciplinary Trauma Program and Systems Education**

Supporting the education of future trauma surgeons is pivotal. These surgeons will deal with the sickest patients that the system can provide. Critical care training prepares individuals to understand the physiology, but technical training should not be taken for granted.

Finding a way to collaborate internationally presents an interesting opportunity to improve health care in underserved areas, increase opportunity for research in places that otherwise will not count with the training and exposure as well as improve the technical skills of surgeons in developed countries.

As long as this is done following common objectives, the principle of reciprocity, and maintaining ethical behaviors, there are immense possibilities for improving education and as a consequence patient care, globally.

The present article is a descriptive study that explores the international medical student's perception of an educational experience. For future manuscripts, the authors might want to explore conducting surveys or interviews. The qualitative research interview seeks to describe the meanings of central themes in the life world of the subjects. The main task in interviewing is to understand the meaning of what the interviewees say. A qualitative research interview seeks to cover both a factual and a meaning level, though it is usually more difficult to interview on a meaning level. This can create a more scientific paper rather than just a description.

The description is a valid one and can be a good start for future projects.

The future is bright when it relates to global surgery; at any level, there are infinite opportunities to learn from each other and enhance collaboration.

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### **Rotaciones tipo observador en los servicios de trauma en Estados Unidos, como modelo de educación para estudiantes internacionales en sistemas y programas de trauma multidisciplinarios**

Es fundamental apoyar la educación de aquellos cirujanos de trauma del futuro. Estos cirujanos se ocuparán de los pacientes más enfermos que el sistema puede proporcionar. El entrenamiento en cuidados críticos prepara a los individuos para entender la fisiología, pero la formación técnica no debe ser menospreciada.

Al determinar maneras de colaborar a nivel internacional, se presenta una oportunidad interesante para mejorar los cuidados de salud en las zonas carentes de atención, aumentar la oportunidad de investigación en lugares que de otro modo no contarán con dicha formación y exposición, así como mejorar las habilidades técnicas de los cirujanos en los países desarrollados.

Mientras esto se realice siguiendo objetivos comunes, el principio de reciprocidad, y la sumersión en comportamientos éticos, existen inmensas posibilidades de mejorar la educación y como consecuencia la atención al paciente, a nivel global.

El presente artículo es un estudio descriptivo que explora la percepción del estudiante de medicina internacional de una experiencia educativa. Para manuscritos futuros los autores podrían explorar la realización de encuestas o entrevistas. La entrevista de investigación cualitativa busca describir y encontrar los significados de temas centrales en el mundo de la vida de los sujetos. La tarea principal en la entrevista es entender el significado de lo que dicen los entrevistados. Una entrevista de investigación cualitativa busca cubrir tanto hechos como significados, aunque generalmente es más difícil entrevistar a un nivel de significados. Esto puede crear un documento más científico en lugar de sólo una descripción.

La descripción es válida y puede ser un buen comienzo para proyectos a futuro.

El futuro es brillante en cuanto se refiere a cirugía global, en cualquier nivel existen oportunidades infinitas para aprender unos de otros y para mejorar la colaboración.

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