NEUROSURGERY BOOT CAMP
Bolivia 2015

Collaborative Professional Development of Tomorrow’s Neurosurgeons in Latin America

October 12 and 13, 2015
Santa Cruz de la Sierra, Bolivia

A project developed with the collaboration of the Bolivian Society for Neurosurgery, the Foundation for International Education in Neurological Surgery (FIENS), the Institute for the Development of Neurosurgery (IDN), Puente de Solidaridad, the Santa Cruz Society of Neurosurgeons, the University of Massachusetts Medical Center and Medical School, Department of Neurosurgery, and Atlas Medical, Globus Medical, Medtronic and Stryker Corporation.
I. INTRODUCTION

Building on its long history of professional engagement and medical missions to Bolivia that serve patients in need of neurosurgery, Solidarity Bridge organized and implemented Boot Camp: Fundamentals of Neurosurgery in Santa Cruz, Bolivia on October 12 and 13, 2015. Solidarity Bridge worked closely with the newly founded Institute for the Development of Neurosurgery (IDN) and long-time Bolivian partner Puente de Solidaridad to make this course for neurosurgery residents a reality.

Conducted just days before the 11th Congress of the Neurological Society of the Southern Cone (Cono Sur), this course was the initial educational event launched by IDN and the first-ever resident Boot Camp offered in Latin America. The Boot Camp drew on significant collaboration from the Bolivian Society for Neurosurgery, the Santa Cruz Society of Neurosurgeons, the University of Massachusetts Medical Center and Medical School, and the Foundation for International Education in Neurological Surgery (FIENS).

II. WHY BOOT CAMP?

Boot Camp is a tried and true introductory course developed by the Society of Neurological Surgeons (SNS) in the United States to provide fundamental knowledge to neurosurgery residents and is a requirement for new residents in the US. The model transfers information, experience and wisdom from mentors (experienced neurosurgeons) to students (new residents).

III. PARTICIPANTS

The October course was strategically set within the framework of the Southern Cone Congress in Latin America so that residents from several countries of Latin America could gain knowledge and practical skills under the guidance of experienced professionals from the United States and Bolivia. These doctors worked together in the unique multi-national environment of the course, which was cordially hosted by Bolivia’s Caja Nacional Hospital.

In all, 21 neurosurgery residents from Bolivia, Chile, Peru, Ecuador and Argentina completed the course. Three young Bolivian neurosurgeons participated in discussion groups and practical sessions, and were joined by other students and medical professionals who attended lectures offered by the Boot Camp’s international faculty.
IV. TEACHING METHODS and LEARNING

Boot Camp employed three major educational methods: lectures and guided case study analysis on the first day of the course, followed by hands-on practical learning at work stations on day two. These experiences are detailed as follows:

A. Lectures presented by prominent U.S. and Bolivian surgeons offered a broad array of information in concise presentations using visual tools:

**Professionalism and Quality Care:**
- Professionalism, Supervision, and Pearls and Leadership (Dr. Richard Moser)
- Patient Safety and Clinical Communications/Handoffs Lecture (Dr. Robert Dempsey)
- Quality Improvement/Safety and Surgical Checklists (Dr. Roberta Glick)

**Basic Reviews**
- Cerebral Vascular Anatomy (Dr. John Weaver)
- Ventricular Anatomy (Dr. Art DiPatri)
- Surgical Anatomy of the Spine (Dr. Martin Aliaga)

**Assessments**
- Neurological and Neurotrauma Assessment (Dr. Rolando Vaca Diez)
- Emergency Cranial Radiology Assessment (Dr. Carlos Dabdoub)
- Emergency Spinal Radiological Assessment (Dr. Miguel Saenz)

**Management**
- ICP Management (Dr. Robert Dempsey)
- Making the Incision: Surgical Pause to Scalp Blood Supply (Dr. Russell Andrews)
- Emergency Evaluation and Management of Hydrocephalus Shunt Patients (Dr. Isabelle Germano)

B. Case discussions, led by a US and Bolivian pair of neurosurgeons using scenarios prepared by the SNS, permitted residents to discuss twelve to fourteen cases, including those of unstable patients. Residents analyzed clinical information and proposed treatment options. Experienced neurosurgeons asked focused questions, challenged misconceptions and drew on their own experience in the analysis of these cases.
C. Hands-on Work Stations: Under the guidance of their mentors, and in some cases using instruments provided by industry collaborators Medtronic, Stryker and Globus Medical, residents practiced the following basic and intermediate skills:

**Basic**
- **Lumbar drain/puncture** (Medtronic): Dr. Russell Andrew, Dr. Jorge Botello, and Dr. Roberto Rojas
- **Pediatric shunt tap** (Medtronic): Dr. Roberta Glick, Dr. Fernando Molina, Tom Poss, Nancy Vinas, Diego Arias
- **III Ventriculostomy** (Medtronic box): Dr. Art DiPatri, Dr. Martin Aliaga
- **ICP monitor (Camino) & ventriculostomy** (Artisan Medical): Dr. Robert Dempsey, Dr. Gabriel Cuellar
- **Tong traction & Gardner skull positioning (cranial)**: Dr. Isabelle Germano, Dr. Miguel Saenz

**Intermediate**
- **Craniotomy, dural opening/closing, skull Plating**: Dr. Jared Ament, Dr. Rolando Vaca Diez, and Amy Juker (Stryker)
- **Spine station**: Fusion (Globus, Atlas): Dr. John Weaver, Dr. Edgar Carrasco, Zachary Kaufman
- **Drilling**: Under microscope: Basic and Intermediate (Stryker): Dr. Richard Moser, Dr. Miguel Duchen

Residents mastered tong traction and skull positioning techniques under the tutelage of Dr. Isabelle Germano and Dr. Miguel Saenz.
Instructors guided residents through each procedure and used a standard checklist to ensure that each student mastered the necessary skills. These hands-on stations were marked by a high level of collaboration among the residents who observed the work of their colleagues, in addition to performing the task at hand.

V. CONCLUSIONS AND EVALUATION

The course was formally evaluated using a measurement tool for residents that assessed use of time, quality of instruction and relevance and applicability. On a scale of 1 to 5, with 5 as excellent, feedback from residents consistently ranked course elements as very good to excellent. (See Appendix 1).

Comments from the residents expressed a high level of satisfaction and the hope that the course will be replicated in Bolivia and elsewhere. In the words of Ecuadoran resident Jonathan Schuldt Teran:

The hands-on module was just amazing, especially for first year residents like me. Having attending neurosurgeons and a Bolivian colleague assessing our participation in every aspect of the course was just brilliant.

Similarly, Bolivian faculty valued the course highly and, in the hope of participating in future endeavors, offered helpful suggestions for continued learning. (See Appendix 2).

Dr. Isabelle Germano, Professor of Neurosurgery and Director of the Comprehensive Brain Tumor Program at the Mount Sinai Medical Center in New York, provided insights into the success of the program:

Congratulations for arranging a successful Boot Camp! The event was perfectly organized in all details due to your dedication and enthusiasm. Thank you for including me in this project and giving me the opportunity to meet colleagues with similar interests. I was very pleased to see how much the participants enjoyed the experience and how grateful they were.

VI. KEY PLAYERS

Solidarity Bridge thanks the organizations and individuals who made this event possible, including but not limited to the

Coordinators
Richard Moser, MD
Roberta Glick, MD
Juan Lorenzo Hinojosa, Ph.D. Founder of Solidarity Bridge
Faculty

U.S. Speakers and Presenters
Russell Andrews, MD  Roberta Glick, MD
Robert J. Dempsey, MD  Richard Moser, MD
Arthur J. DiPatri, MD  John Weaver, MD
Isabelle Germano, MD

Bolivian Speakers, Presenters and Hosts
Martin Aliaga, MD  Fernando Molina, MD
Jorge Botello, MD  Tito Porcel, MD
Edgar Carrerasco, MD  Roberto Rojas, MD
Gabriel Cuellar, MD  Miguel Saenz, MD
Carlos Dabdoub, MD  Rolando Vaca Diez, MD
Miguel Duchen, MD

Industry Representatives
Amy Juker, Stryker
Tom Poss, Diego Arias and Nancy Vinas, Medtronic
Zachary Kaufman, Globus Medical and Atlas Medical

Support Staff
Mary McCann Sanchez, Senior Director of Programs, Solidarity Bridge
Patricia Vargas Rojas, Executive Director of Puente de Solidaridad
Puente de Solidaridad local staff: Carol Adaya, Jose Choque, Patricia Paz Estenssoro, Beatriz Rojas, Carmen Salses
Mateo Hinojosa and M’wende Hahesy of Woven Path Media

Several members of the Boot Camp community: Dr. Roberta Glick, Dr. John Weaver, Juan Lorenzo Hinojosa, PhD, Dr. Russell Andrews, Dr. Richard Moser, Dr. Art DiPatri, Dr. Robert Dempsey, and Dr. Isabelle Germano.
Appendix 1 - Resident Boot Camp Evaluations

21 residents completed the evaluation form provided at the end of the Boot Camp held in Bolivia on October 13, 2015, using the following scale:

1 - not satisfactory          3 - good          5 - excellent
2 - satisfactory              4 - very good

1. Lectures (Day 1)                        Averaged Results
a. I learned something new.                4.2
b. I can apply what I learned in my profession.  4.5
c. Quality of the instructors.             4.9

2. Discussion groups – cases (Day 1)
   a. I learned something new.                4.4
   b. I can apply what I learned in my profession.  4.7
   c. Quality of the instructors.             4.8

3. Stations (Day 2)
   a. I learned something new.                4.5
   b. I can apply what I learned in my profession.  4.8
   c. Quality of the instructors.             4.9

4. Organization of the event                4.5

Comments
- Excellent course/many thanks/amazing experience/very satisfied/productive (8)
- Present this course each year for continual updating/I would attend again (4)
- First Boot Camp in Latin America/I am proud to have been a part of it

Suggestions
- Allow more time for the initial lectures (2)
- Include case studies in the initial lectures.
- Include more content on neuro navigation and neurosurgery
- Better organization of time/more time for the practicum
- More on arthrodesis
- Increased outreach /more info about location (3)
- Improve some written and oral translation

Areas of new learning
- Capacity to analyze cases
- Management of systems
- Ventricular drainage
- Surgical techniques: ventriculostomy
- Lumbar drainage
- Endoscopy/neuroendoscopy (5)
- Landmarks for ventriculostomy
- Basics of neurocritical patients
- How to troubleshoot in surgery
- Ventriculoperitoneal shunt
- Planning neuroendoscopic surgery
- Suturing using the microscope
- Craniotomy
- Lumbar puncture (2)
- New techniques and exposure to neurosurgeons from other countries
- Spine station
- Drilling
- Skull positioning using Mayfield
- Use of screws, pins and plating
- Clarifications regarding cerebral anatomy and imaging
Appendix 2 – Bolivian Faculty Boot Camp Evaluations

5 Bolivian faculty completed the evaluation form provided at the end of the Boot Camp held in Bolivia on October 13, 2015, using the following scale:

1 – not satisfactory
2 - satisfactory
3 – good
4 – very good
5 - excellent

<table>
<thead>
<tr>
<th>1. Lectures (Day 1)</th>
<th>Averaged Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The content was relevant.</td>
<td>5</td>
</tr>
<tr>
<td>b. The time allotted was sufficient.</td>
<td>4.5</td>
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<td>c. The resources used contributed to the quality of the</td>
<td>4.75</td>
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<td>activity.</td>
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<th>2. Discussion groups – cases (Day 1)</th>
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<td>activity.</td>
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<th>3. Stations (Day 2)</th>
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<tr>
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<td>5</td>
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<tr>
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<td>5</td>
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<td>activity.</td>
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| 4. Organization of the event                             | 4.75             |

Suggestions

- Allow 5 more minutes for each lecture
- Additional courses should be offered in different cities in Bolivia, building on the foundation of Bolivian faculty who participated in this Boot Camp
- Information from this course could be converted into a web page that future participants could access before participating in the course