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## Oral Presentation

### The “Hub & Spoke” System: a Model of Integrated Neurosurgical Trauma Care System in the Geographical Area of Western Emilia Romagna, Italy

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#### Abstract

Guidelines for the management of severe traumatic brain injury (TBI) have been published both in the USA and Europe. Unfortunately, none of these guidelines contain clear statements about which patients should be admitted to a neurosurgical centre. Neurosurgical care is limited in many parts of the world to one or two Hospitals serving a large geographical area. Therefore still under debating is about the best TBI management between the centralization of all patients in one neurosurgical hospital (NSH) or the selection of the patients in a previous general hospital (GH) rough telecounselling after trauma. The quality of the imaging, the feasibility of the sharing-pictures softwares play an important role on the efficacy of TR. The technological knowledge should be rapidly upgraded in the cultural background within healthcare organizations. The referral protocol of the patients is another important aspect of TR, but the developing of guidelines is depending from the different scenarios where the TR could be applied, even in rural areas and in metropolitan healthcare system. The combination of teleradiology and guidelines for head injury management could allow in so different areas a better selection for patients' referral to Neurosurgery. The “Hub & Spoke” system provides one high specialized trauma center (Hub) and several peripheral hospitals (Spokes) all connected with telemedicine systems and equipped with shared protocols for the management of the patients. The authors report the territorial organization of TBI management in an area of 1.200.000 people, in the western part of Emilia Romagna region, Italy. The Hub is a II level trauma center, with high expertise for any traumatic complexity, with neurosurgeon on duty 24h. The Spokes are dislocated in nine general hospitals with a lower helath care level in the treatment of trauma patients, with emergency facilities and CT scan 24h. Moreover, as specific feature of this regional rauma system, one Spoke is a trauma center of I level with neurosurgeon on duty from 8 a.m. to 8 p.m. and on-call during the night. The Hub and the Spokes are connected with differents telemedicine systems, through a radiology information system (RIS)/picture archiving and communication system (PACS) off site workstation and server connection. Patients with severe TBI or with complex polytrauma need management in the Hub. Patients with mild TBI can be managed in hub and in Spokes with similar results if specific area protocols are applied. The patients with spine trauma can be managed in the Spoke with neurosurgical facilities as in the Hub, if prompt treatment is required. Otherwise the treatment is planned according to area protocols.

**Keywords:** Hub and Spoke, TBI, RIS.

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