

Title: Harnessing Human Energy: A Capacity-Building Algorithm for Spine Surgery in Developing Countries

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Background: Safe spine surgery requires particular human and material resources. These requirements increase with disease complexity. The Global Spine Care Initiative (GSCI) describes the global burden of spinal disease and treatment plans. Surgery was mentioned as part of these plans, but there is currently no detailed strategy for safe spine surgery in LMICs.

The current study outlines an LMIC-specific algorithm for safe surgical treatment of spinal diseases based on diagnosis, procedure, and institutional capacity. This algorithm focusses on human energy and resources, including organizational management and logistics, in addition to infrastructure and material resources.

Methods/Results: The current analysis follows the Lancet Commission on Global Surgery Surgical Assessment Tool, as well as the GSCI. The Lancet Commission outlined “key factors” affecting provision of safe surgical care: infrastructure, workforce, service delivery, financing, and information management. We have organized spinal diagnoses into four groups: Trauma, Infection, Tumor, and Degenerative. Spinal procedures have been organized into four categories based on complexity of the procedures: Basic, Intermediate, Advanced, and Very Advanced categories. Four global sites - the Philippines, Tanzania, Nepal, and Bulgaria – demonstrate the utility of the algorithm.

Discussion/Conclusions: Our analysis of four different sites shows that the spinal surgery capacity of institutions depends on workforce and human energy as well as equipment and infrastructure. We hope this algorithm will become a tool for assessment and amelioration of spinal care in LMICs and allow for quantification of capacity and concrete deliverables to donors, which could lead to sustainable safe surgical care of the spine.