Abstract

AI-enabled decision support for spine surgery integrated in the EHR (NORspine)

Over the past two decades, spine surgery has undergone significant transformations, evolving from extensive openings to minimally invasive procedures and reducing the reliance on unnecessary fusion. However, despite these advancements, 30% of patients still do not experience substantial improvement. To enhance our outcomes, we aim to shift our focus from how we operate to selecting suitable candidates for surgery.
In our innovative project, we are integrating AI into Electronic Health Records (EHR) to facilitate "Shared Decision Making," aiming to improve overall results by avoiding unnecessary surgeries for those unlikely to benefit.

The process unfolds in four steps:
1. Patient Pre-Assessment: Patients complete a comprehensive form, including Patient-Reported Outcome Measures (PROMS) and demographic details, before their initial consultation with the surgeon.
2. Data Compilation: The collected information and relevant details from the surgeon are consolidated in the NORspine registry.
3. AI Prediction Model: The registry data and additional patient information are transmitted to an external "AI cloud," where a predictive model has been developed and validated. This model can anticipate the likely outcome for each patient.
4. Visualized Outcome Information: The AI-generated insights are relayed to the EHR, presenting the surgeon and patient with a simple diagram elucidating the probability of success and the associated risks. This empowers informed decision-making.

Moreover, patients who do not undergo surgery will be followed and therefore contribute valuable data to enhance the AI model. The project's evaluation comprises three planned studies: a mixed-methods feasibility study in 2024, a pilot prospective observational clinical trial spanning 2024-25, and a final prospective register-embedded effectiveness study, either as a Randomized Controlled Trial (RCT) or center-RCT. This comprehensive approach aligns with our commitment to advancing spine surgery outcomes through cutting-edge technology and patient-centric decision-making.