7. Hasil Uji Similaritas Advancing predictive accuracy

by Erica Kholinne

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In summary, we commend the efforts of Wu and colleagues to enhance the accuracy of GBD estimates; however, it is crucial for researchers and decision makers to remain aware of the substantial limitations that persist. A major issue is the scarcity of observed prevalence and severity data. Although accounting for access to treatment could potentially improve severity estimates, the assumptions made introduce new uncertainties, which is particularly relevant for conditions like low back pain, where treatment effects are relatively small and likely to be highly context dependent. The most substantial, but very resource-intensive, improvement to GBD estimates for low back pain would be to obtain prevalence and severity estimates directly from a broader range of countries. Until this occurs, the GBD estimates must still be interpreted with caution.

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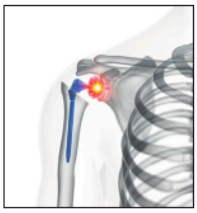
Advancing predictive accuracy for shoulder replacement surgery

The surge in shoulder replacement surgeries in some countries over the past decade has emphasised the need for more accurate prediction models. Despite advancements in surgical techniques, the increase in serious post-surgery complications has underscored the urgency for re-evaluating how patient risks are determined. The methods for predicting the risk of shoulder replacement surgery have their drawbacks. They rely on little data and clinical judgement, which can be subjective. They also do not always capture the full complexity of a patient's health status and tend to miss dynamic changes in the patient's condition. Additionally, they do not provide personalised assessments and are slow in providing feedback. These traditional methods do not fully leverage the available data from imaging and laboratory tests, resulting in inadequate predictive capabilities.

Predictive modelling for shoulder surgery is revolutionary as it examines a patient's data such as age, medical history, imaging, and genetics to assess their individual risks. These computer models are more accurate and better at predicting risks than traditional methods because they identify complex patterns and interactions that traditional methods might miss. They can also be updated in real time with new data, which improves doctors' decision making in the early stage of patient counselling. This approach uses evidence to improve outcomes, save money, and improve surgery success rates.

The study by Epaminondas Markos Valsamis and colleagues[1] in *The Lancet Rheumatology* made significant strides in addressing this need by developing and validating a robust prediction model for estimating the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risk of 90-day serious adverse events following primary shoulder replacement surgery. By leveraging data from national joint registries and hospital records in England and Denmark, this model offers methodological rigour and practical applicability that is crucial in diverse health-care settings. The study presents compelling data from more than 40 000 shoulder replacements in England and validation with Denmark's procedures. The model's remarkable discrimination, as indicated by a high C-statistic for internal and external validation, underscores its reliable performance across different populations. These findings firmly established the model's clinical utility and potential to identify high-risk patients accurately. This study advances our understanding of shoulder replacement surgeries and has important implications for health-care professionals and patients.

This prediction model integrates readily available clinical variables, providing personalised risk estimates that can substantially enhance patient–surgeon consultations. For instance, it can differentiate between a low-risk patient, such as a 50-year-old woman with no comorbidities (0·6% risk of 90-day serious adverse event), and a high-risk patient, such as an 80-year-old man with multiple comorbidities undergoing surgery for acute trauma (30·4% risk of 90-day serious adverse event). Such precise risk stratification supports targeted interventions, including enhanced recovery pathways for high-risk patients and potential day-case surgeries for low-risk individuals.

The study's strict adherence to TRIPOD guidelines, thorough internal and external validation, and inclusion of decision curve analysis have set a high standard for prediction model development in shoulder replacement surgery.[2] The decision curve analysis has also highlighted the model's clinical usefulness across various risk thresholds, making it relevant for many patients undergoing primary shoulder replacement surgery. Unlike previous models, this study has overcome small sample sizes, methodological weaknesses, and not having decision curve analysis, providing a dependable tool for clinical practice.[3,4]

Although the model shows potential, recognising its limitations is important. Depending solely on regularly collected hospital data might result in omitting important predictors, such as patient support systems at home. Additionally, although the model captures major complications that require hospitalisation, it does not consider less severe complications that could still affect a patient's quality of life.

Personalised risk estimates can help clinicians identify high-risk patients who could benefit from enhanced surgical recovery pathways or additional postoperative care, and empower patients and their families to make informed decisions about surgical options during the consenting process,[5] which ultimately leads to better outcomes and helps optimise resource allocation in health-care systems. The model uses predictor variables that are easily accessible during preoperative clinical consultations and applies to most patients needing a shoulder replacement.

This study introduces a strong and validated prediction model that accurately estimates serious medical complications requiring hospital admission within 90 days of primary shoulder replacement surgery. With the rising rates of shoulder replacement, this model provides valuable information for clinicians and patients to make informed decisions and support the consent process. In an era in which precision medicine is increasingly important, this study represents a substantial advancement in orthopaedic surgery, allows the development of web-based predictive tools, and promotes a more informed and patient-centred approach to shoulder replacement surgery.

We declare no competing interests.

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