

# **POSSUM - preoperative risk assessment, managing treatment, level of care and length of stay for orthopedic patients**

## **Author**

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## **Type of poster**

Research project

## **Background**

There are currently no nationally used preoperative scoring system that can identify patients at risk and that also takes account of casemix in prediction of morbidity and mortality. POSSUM - Physiological and Operative Severity Score for the Enumeration of Mortality and Morbidity is an instrument that is used for that purpose. As we routinely have no standardized guidelines to identify patients at risk all patients are treated at the same level of care pre-and post operatively. A custom made treatment at different level of care could be preferable to avoid adverse events. With increased surgical production and patient flow it has become more important to be able to predict length of stay within the clinic and also at referral to a geriatric or rehabilitation clinic. From previous studies POSSUM have also obtained data that can be used to monitor quality of work internally and to compare individual surgeons, clinics, hospitals and regions. To evaluate if it could be possible to use POSSUM in our patient population a pilot study was performed.

## **Purpose**

To assess if POSSUM can

- generate a reliable prediction of 30-day morbidity and mortality
- be used as a base to predict the level of care
- be used as a base to predict length of stay
- be used for evaluation of internal staff competence

## **Method**

All patients that had undergone orthopedic surgery at Karolinska University Hospital Solna were included in a prospective 3 month pilot study with a follow up after 30 days. The POSSUM instrument was used to create a risk score for mortality and complications. To be able to obtain necessary data for the POSSUM instrument a physiological assessment and a measure of the operative severity was performed for each individual and transformed to a risk score. To assess adequate level of care for the patient, a model from Warrington hospital was used for categorizing the patients in different risk groups for mortality (>5%, 5-10%, 10-20%, >20%). The patient's length of stay was registered and the mean value for each risk group was reported. To assess quality of work of the internal staff competence the complication rate for the individual surgeons was evaluated and compared to the expected outcome.

## **Results**

428 patients were enrolled in the study and 485 operations were carried out. Possum predicted 27% of complications and actual outcome was 26.2%. Possum predicted 4.8% mortality and actual outcome was 1.1%. When categorizing the study population in different risk groups the casemix showed an excess of seriously ill patients. Only 11.5% of the patients had a predicted complication risk less than 10% and as much as 66% had >20% risk for complication. The mean length of stay for patients with >10% risk score was 7 days, it was 19 days with a risk score of 10-20% and 11 days with a risk score >20%. The evaluation of the surgical staff showed that 12/27 surgeons (44%) had a higher complication rate than expected.

## **Discussion/conclusion**

The result of this pilot study indicates that POSSUM can predict the complication rate well and give a good idea of casemix, but, as in earlier studies POSSUM over predicted the mortality rate. The categorizing of patients in different risk groups can be used as a tool to plan the best level of care for the individual patient. A model with differentiated level of care i.e. routine care, additional daily round of an internist, High Dependency Unit or Intensive Care depending on the patients' risk score has been used at other hospital with good result. The length of stay is more difficult to evaluate as the patients with poor physical status often are referred to a geriatric or rehabilitation clinic where the treatment is continued and this stay was not overviewed in the pilot study. The evaluation of internal staff competence can make it possible to find systemic errors and invite to an open discussion that can be constructive and vital to improve patient safety. All areas that are highlighted are of great interest in order to plan and continuously monitor quality of care and patient safety and can also be used for open comparison. We believe that further longitudinal studies with enrollment of patients at least 1 year is needed to evaluate the instrument completely.

## **Keywords**

preoperative risk, mortality, morbidity, level of care, length of stay, internal staff competence