likely to be younger and more active than ever, have high expectations regarding physical functioning after surgery. Physical functioning has several aspects, such as perceived (problems in) daily functioning, the capacity or ability to perform activities in a (semi) laboratory setting, and actual performance in the home situation. To date, no comprehensive systematic review concerning recovery of physical functioning after THA has been published. A structured overview of recovery of physical functioning after THA may help surgeons provide patients with better information before surgery, as well as help patients and surgeons to form corresponding expectations regarding functional outcome after THA. The aim of this study is to summarize the state of knowledge regarding the recovery of physical functioning after surgery, and to examine whether different aspects of functioning show the same pattern of recovery.

Methods: The Medline and Embase medical literature databases were searched up to October 2008. Two reviewers independently assessed the inclusion criteria, the methodological quality and extracted the results. Enough homogeneous data were available to pool the data by means of meta-analysis for the results of perceived physical functioning measures WOMAC Physical Functioning (WOMAC PF) (score 0-68, 0 = best score) and SF-36 Physical Functioning (SF-36 PF) (score 0-100, 100 = best score), and the capacity measure walking speed derived from gait analysis. Data were pooled for the following time periods: preoperative, one to three months postoperative, six to eight months postoperative, and twelve months postoperative.

Results: Twenty-nine articles met the inclusion criteria. Perceived physical functioning was measured with the WOMAC PF and the SF-36 PF in ten studies, with the Oxford Hip score in three studies, and with the AIMS Physical Activity subscale in one study. Twelve months after surgery patients almost reached the maximal score on the WOMAC PF (9.3±3.5). On the SF-36 PF hip patients scored as good as a healthy study population in the Netherlands (76.9±4.7 versus 77±17) twelve months after surgery. Measured with the Oxford Hip Score most recovery had also taken place within the first twelve months after surgery.

The capacity of patients to perform activities in a laboratory setting was measured with gait analysis in eleven studies, and with capacity tests in six studies. Actual functioning in the home situation of the patients was assessed in one study. Twelve months after surgery patients didn’t reach the norm scores of a reference population for walking speed (1.06±0.004 versus range age-matched controls 0.91-1.63 m/s). Measured with capacity tests the recovery of physical functioning increased in the first twelve months after surgery. We found no reference data of healthy controls for capacity tests. Measured with an activity monitor in the home situation of the patients six months after surgery the percentage movement related activity of patients was lower than age-matched controls (9.2% ± 3.7 versus 11.0% ± 2.9).

Conclusions: Perceived physical functioning seemed to reach ceiling levels within twelve months after surgery. A different pattern of recovery was seen for the capacity to perform activities in a (semi) laboratory setting, and actual performance in the home situation. Based on the results of this study patients can further improve on capacity and actual performance after twelve months after surgery. Only few studies had a follow up time of more than twelve months, so little information is available about the recovery of physical functioning longer than twelve months after surgery.

538 CARDIAC AND THROMBOEMBOLIC MORBIDITY AFTER TOTAL KNEE ARTHROPLASTY

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Purpose: Study the prevalence and predictors of cardiac and thromboembolic events after primary Total Knee Arthroplasty (TKA) in a population-based study using Rochester Epidemiology Project and Total Joint Registry.

Methods: We studied the occurrence and predictors of cardiac (myocardial infarction, arrhythmia and congestive heart failure) and thromboembolic events (deep venous thrombosis, pulmonary embolism) within 90-days of primary TKA in all Olmsted County residents who underwent primary TKA at the Mayo Clinic, using univariate and multivariable logistic regression analyses.

Results: There were 1551 TKA surgeries in Olmsted county residents (37.4% men, 62.6% women). The prevalence of 90-days post-operative cardiac events was 8.1% overall, higher in patients with pre-existing cardiac event (19.7%) compared to those without (1.7%). The prevalence of 90-day post-operative thromboembolic events was 5.2% overall, higher in patients with prior thromboembolic event (3.6%) compared to those without (2.5%).

In patients with pre-existing cardiac events, odds of 90-day cardiac events were significantly higher in older subjects, Odds ratios (OR; 95% confidence interval (CI)), 1.22 (1.08,1.38; p=0.001) per 5-year increase, higher Charlson index, 1.67 (1.17,2.39; p<0.001) per 5-point increase and higher ASA class III–IV, 2.43 (1.53,3.87; p=0.005) relative to class I–II. Multivariable analyses confirmed that age, ASA and Charlson index were significant predictors.

Older age, 1.66 (1.23,2.22; p=0.01) was a significant predictor of 90-day cardiac events in those without prior history of cardiac events in univariate analysis. In univariate analyses in those with pre-existing thromboembolic events, odds of 90-day thromboembolic events were significantly higher in men, 2.98 (1.25,7.12; p=0.01) and in those with higher Charlson index 1.88 (1.001,3.52; p=0.0495). Only older age was significant in multivariable analysis.

Older age, 1.19 (1.03,1.38; p=0.02) and higher Charlson index score, 2.05 (1.30,3.24; p=0.002) were significant predictors of 90-day thromboembolic events in patients with prior history of thromboembolic events in univariate analyses. Multivariable analyses found that Charlson index, but not age, was a significant predictor of 90-day thromboembolic events.

Conclusions: Older age, higher comorbidity and male gender predicted higher risk of 90-day cardiac and thromboembolic events after TKA. Knowledge of these risk factors can help inform surgeons and patients regarding their outcomes. Optimal pre-operative comorbidity management may decrease peri-operative morbidity in patients undergoing TKA.

539 PREVALENCE AND PREDICTORS OF 90-DAY CARDIAC AND THROMBOEMBOLIC EVENTS AFTER ELECTIVE TOTAL HIP ARTHROPLASTY

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Purpose: To study the prevalence and predictors of cardiac and thromboembolic events and mortality after Elective Primary Total Hip Arthroplasty (THA) in a population-based study.

Methods: Using the Rochester Epidemiology Project and Total Joint Registry, we identified all Olmsted County residents who underwent elective primary THA at the Mayo Clinic between 1994 and 2008. We identified the occurrence of cardiac and thromboem-
bolic events within 90-days of a THA, after excluding patients with an underlying diagnosis of hip fracture as the indication for THA. Cardiac events were defined as occurrence of myocardial infarction, arrhythmia and congestive heart failure. Thromboembolic events were defined as occurrence of deep venous thrombosis or pulmonary embolism.

All analyses were performed separately for patients with and without pre-existing cardiac and with/without thromboembolic disease. This was done since the frequencies of 90-day cardiac and thromboembolic events were clearly different usually by several fold for patients with and without prior history of respective disease.

Multivariable logistic regression for potential predictors (age, gender, Charlson comorbidity index and American Society of Anesthesiology (ASA) grade) of 90-day cardiac and thromboembolic events included variables with univariate significance of p<0.20 and used backward selection. Odds ratios (OR; 95% confidence interval (CI)) and p-values are presented for significant predictors (p<0.05).

**Results:** There were 1155 THA surgeries (43.2% men, 56.8% women). 90-days post-operative cardiac events occurred in 6.4% overall and 90-day post-operative thromboembolic events in 4.2%.

In patients with pre-existing cardiac events, 90-day cardiac events were significantly more in older subjects, Odds ratios (OR; 95% confidence interval (CI)), 1.37 (1.17, 1.61; p<0.001) per 5-year increase, higher Charlson index, 2.01 (1.23, 3.27; p=0.005) per 5-point increase and higher ASA class III-IV, 5.88 (2.59, 13.34; p<0.001); lower in men, 0.44 (0.25, 0.78; p=0.005). Gender and ASA class were significant in multivariable analysis.

Older age, 1.48 (1.10, 1.98; p=0.01), ASA class III-IV, 6.07 (1.60, 23.1; p=0.008) and higher Charlson score, 5.39 (2.94, 12.38; p<0.001) significantly predicted 90-day cardiac events in those without prior history of cardiac events in univariate analysis. In univariate analyses in those with pre-existing thromboembolic events, odds of 90-day thromboembolic events were significantly lower in older, 0.71 (0.54, 0.92; p=0.01) and in those with higher Charlson index, 0.14 (0.02, 0.99; p=0.0495).

None of the variables significantly predicted 90-day thromboembolic events in patients without respective prior history in univariate and multivariable analyses.

**Conclusions:** The findings from this study regarding risk factors for cardiac and thromboembolic events 90-days after THA can help to better surgeons and patients.

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**HEMICALLOTASIS CAN MAINTAIN THE OPTIMAL CORRECTION ANGLE WITH LASTING LONG TIME IN THE PATIENTS WITH MEDIAL GONARTHROSIS**

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**Purpose:** A proximal tibial open-wedge osteotomy with hemicallotasis, or HCO, was first described by Turi et al. as a new procedure for medial gonarthrosis with a varus deformity. We performed a prospective follow-up trial and investigated the long-term outcomes of HCO for medial gonarthrosis.

**Methods:** Between 1995 and 1997, 24 knees in 22 patients were treated with HCO. Five patients with 5 knees had died for reasons unrelated to the surgery within 10 years after surgery. One patient with one knee was excluded because of difficulty in walking due to the onset of a stroke. Furthermore, one patient with one knee lost contact with us. The remaining 15 patients with 17 knees were available for evaluation in this study. The patients included 4 men and 11 women. The average age of the patients at the time of surgery was 66, the age-range was from 58 to 73. The average follow-up period was 12 years, ranging from 10 to 13 years. The preop. radiographic grade of osteoarthritis evaluated by the Kellgren-Lawrence's classification are one knee as grade II, 8 knees as grade III and 8 knees as grade IV. All patients were evaluated before the operation, 2 years after surgery and at the final follow-up. For clinical examination, we used the Hospital for Special Surgery (HSS) scoring system. For radiological examination, we measured the femoro-tibial angle (FTA) in the standing position.

**Results:** Out of 17 knees, one knee required an inversion to total knee arthroplasty 10 years postop. The mean HSS scores in the remaining 16 knees were 56 preop. and 94 at 2 years postop. At the final follow-up, the score was 82 which was a slight decrease in comparison with 2 years postop. However, the pain score was satisfactorily maintained. The main reason for the deterioration of clinical results is due to the decrease in function score because of a likely effect of aging. AS for the categorized clinical results based on HSS score, there was one knee as fair and 15 knees as poor preoperatively, and at 2 years postop., 12 knees as excellent and 4 knees as good. At the final follow-up, there were 3 knees as excellent, 10 knees as good, 2 knees as fair and 1 knee as poor. The 13 knees showed an excellent or good clinical score. Preoperatively, the mean FTA was 180 degrees. At 2 years postop., it became an average of 167 degrees. At final follow-up, it was an average of 169 degrees.