

## Moderated Poster Session VIII: Kidney Cancer Friday, October 9, 4:00 – 5:00 p.m.

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Withdrawn

P120

### Role of Biopsy in the Management of Small Renal Masses

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**Introduction and Objective:** The management of small renal masses represents a challenge in that there are a significant number of masses that may be benign. With the increasing use of imaging modalities, there have been greater numbers of incidental renal masses detected. In the 1970's, 10% of tumors were identified incidentally, compared to 1995 where 61% of tumors were detected incidentally. Recent data shows approximately 20% are benign and do not require treatment. Treatments such as cryoablation, radiofrequency ablation (RFA), and surveillance are gaining popularity. Historically, the accuracy of renal biopsy was lower than 50%, but recent publications indicate that the accuracy is higher and approaching 90%. We attempt to ascertain the utility of image-guided biopsy to guide the management of these patients.

**Materials and Methods:** Under computed tomography (CT) guidance, 61 patients with solid renal masses underwent 18-gauge core biopsy. The patients were observed if the pathology was benign and underwent intervention if the pathology was malignant. The group who underwent intervention; final surgical pathology was compared to biopsy pathology.

**Results:** Mean patient age was 61.9 yrs (range: 32 - 86yrs), mean tumor size was 3.4cm (range: 2.2 - 4.8 cm). The non diagnostic rate was 5% (3/61). Pathology was compared of patients who underwent biopsy and subsequent nephrectomy/ partial nephrectomy. The pathology of the biopsy specimen was compared to the final surgical specimen. There was 100% (24/24) concordance between biopsy pathology and final surgical pathology in the nephrectomy/partial nephrectomy group. Fuhrman grade was correctly predicted in 89.4% (17/19) and the correct histologic subtype was identified in all specimens. Oncocytomas and other benign pathology were found in 36.1% (22/61) of patients and were followed on imaging confirming the benign nature of their pathology. Sixteen percent (10/61) of patients underwent nephrectomy, 23% (14/61) had partial nephrectomies, 18% (11/61) had cryoablation, 5% (3/61) had RFA and 37.7% (23/61) were observed for at least 18 months with no progression of their masses. CT-guided biopsy allowed 37.7% of patients to be spared of intervention. Complications included 3 small perirenal hematomas which resolved with bedrest and no intervention.

**Conclusions:** CT-guided percutaneous renal tumor biopsy was found to have a high diagnostic accuracy in predicting malignancy and spared approximately one-third of patients from unnecessary invasive intervention.

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### The Impact on Renal Function After Partial vs. Radical Nephrectomy for Renal Cell Carcinoma: A Systematic Review

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**Introduction and Objective:** The impetus to perform partial nephrectomy (PN), or nephron-sparing surgery, for renal cell carcinoma (RCC) has increased in the past decade from strictly patients with imperative indications for the surgery, such as the presence of a solitary kidney or bilateral tumours, to include those with a normal contralateral kidney (elective indication). This has been largely due to the early detection of incidental

small renal lesions and better surgical techniques that achieve satisfactory cancer outcomes and minimize peri-operative morbidity, with results similar to radical nephrectomy (RN). We further explored the potential benefits of this surgery by conducting a systematic review on the impact of PN on post-operative renal function in comparison to RN.

**Materials and Methods:** We searched MEDLINE for all relevant articles published up to July 31, 2008. We included all randomized-controlled trials (RCTs), cohort studies, and case-based studies that were published in English or French and compared outcomes for PN or RN, specifically post-operative renal function. Two independent reviewers abstracted relevant data and performed quality assessments on each selected study. We compared pre- and post-operative renal function, as a measure of changes in serum creatinine, estimated glomerular filtration rate (eGFR), creatinine clearance (CrCl), or need for dialysis for both PN and RN groups.

**Results:** We identified 210 unique citations, of which 17 cohort studies (1 prospective, 16 retrospective) met our inclusion criteria. Studies were grouped and compared according to the indication for performing PN imperative (2 studies), elective (8 studies), or a mixture of both (7 studies). All 8 elective studies showed no difference in post-operative renal function in patients undergoing PN, and a significant worsening of renal function in the RN group. Furthermore, post-operative complications and cancer-related morbidity and survival outcomes were similar in both groups, although study durations were relatively short.

**Conclusion:** PN appears to better-preserve post-operative renal function compared to RN for small renal tumours, while maintaining similar surgical and cancer-specific outcomes. Whenever feasible, a nephron-sparing approach should be utilized to minimize any future progression to chronic renal insufficiency.

P122

### Factors Predicting Renal Impairment on Long-Term Follow-Up, Following Partial Nephrectomy: McGill 10 Years Experience

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**Introduction and Objective:** The objective of this study is to assess the factors predicting chronic renal disease on long term follow up, following partial nephrectomy.

**Materials and Methods:** Retrospective collection of data of 140 cases, subjected to partial nephrectomy, in McGill university hospitals was done, in the time period between 1989 and 2007. Statistical analysis of the data was done using chi-square and Fischer exact tests; correlating patients' age, sex, associated chronic disease, preoperative renal function, tumour size and type and duration of renal ischemia, with the postoperative renal functions, at different follow up intervals, up to 10 years duration. Renal function was estimated using serum creatinine and eGFR, using MDRD formula.

**Results:** The mean age was 57.17 years (range 18- 81 years), 4.3% (6 cases) had bilateral partial nephrectomy. The mean tumour size was 3.62 cm. Cold ischemia was applied for 75% of cases (105 patients). The mean ischemic time was 34.91 minutes; being 36.37 minutes for cold ischemia and 29.2 minutes for warm ischemia. The mean preoperative creatinine was 98.2 and the mean serum creatinine at 10 years follow up was 92.67. Clear cell carcinoma represents the most common pathology (65.7%). No statistical difference of applying warm or cold ischemia on the development of renal impairment. There is tendencies in developing renal impairment in older patients, although was not statistically significant. Partial nephrectomy for tumour size more than 4 cm had a trend for the development of postoperative renal impairment,

on long term follow up. The mean ischemic time for the tumours larger and less than 4 cm was 40.66 minutes and 33.36 minutes respectively. 8.57% of our patients had diabetes mellitus and 13.57% had hypertension, preoperatively. There was statistically significant correlation between chronic renal diseases and the presence of diabetes mellitus and/or hypertension with the deterioration of postoperative renal functions. The mean ischemic time in these patients was similar to the ischemic time observed in the other patients (35.08 minutes).

**Conclusion:** Preoperative serum creatinine and eGFR and associated chronic diseases; D.M or hypertension are the only factors predicting postoperative chronic renal disease on long term follow up.

## P123

### Preliminary Report of a Pilot Study of Neoadjuvant Sunitinib for Clinical M0 Renal Cell Carcinoma

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**Introduction and Objective:** Sunitinib is an established treatment for metastatic renal cell carcinoma (RCC). Neoadjuvant sunitinib may facilitate surgical resection by reducing primary tumor size and may decrease risk of recurrence following curative resection. A prospective clinical trial was initiated to evaluate the safety of using sunitinib prior to nephrectomy.

**Materials and Methods:** Patients with biopsy-proven, clear cell RCC, >4cm, were enrolled and treated with sunitinib, 37.5 mg daily, for 3 months prior to nephrectomy. A CT scan was obtained within 2 weeks of starting treatment and repeated after 2 months of therapy. In the first 5 patients, sunitinib was discontinued 5 days before surgery. In subsequent patients sunitinib was continued up to the day of surgery. The primary endpoint was safety.

**Results:** At this time, 11 of 20 planned patients have been enrolled on the trial. Data are available for 8 patients who received sunitinib and underwent nephrectomy. The toxicities associated with preoperative sunitinib were similar to those reported in trials for metastatic RCC; 1 patient required dose reduction for persistent grade 2 fatigue and grade 2 diarrhea; 1 patient required dose interruption for elevated pancreatic enzyme. One patient with grade 1 hypertension and fatigue elected to

undergo surgery after 1 month of sunitinib. The average decrease in the cross-sectional area of the tumor was 30% (4-43%), with 6 patients having a decrease >30%. Table 1 summarizes the surgical outcomes. No patients required a transfusion.

**Conclusion:** There were no surgical complications that were considered related to use of neoadjuvant sunitinib. Sunitinib decreased the size of clinically localized RCCs, and future trials may be considered to evaluate neoadjuvant sunitinib for decreasing risk of recurrence and facilitating organ-sparing surgery.

## P124

### Tumor Size is a Determinant of the Rate of Synchronous Metastases in Patients with T1 Stage Renal Cell Carcinoma

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**Introduction and Objective:** A recent multi-institutional analysis of 995 patients treated for renal cell cancer (RCC) questioned the relationship between tumor size and the rate of synchronous metastases (SM).

**Materials and Methods:** We tested the relationship between tumor size and SM in a population of 22204 patients with T1a and T1b RCC diagnosed and/or treated with nephrectomy for clear cell, papillary or chromophobe histological subtypes in one of nine SEER registries between 1988 and 2004.

**Results:** Within the study population the rate of SM was 9.6% (T1a: 5.6% vs. T1b: 14.2%). Stratification according to 1 cm tumor size intervals revealed that the SM rate increased with increasing tumor size: ≤1.0 cm: 4.8%; 1.1-2.0 cm: 4.2%; 2.1-3.0 cm: 4.9%; 3.1-4.0 cm: 7.1%; 4.1-5.0 cm: 12.1%; 5.1-6.0 cm: 13.3%; 6.1-7.0 cm: 18.4% ( $\chi^2$  trend;  $p < 0.001$ ). A cubic spline analysis showed that tumor size is virtually linearly related to the rate of SM. Stratification according to histological subtype in patients treated with nephrectomy revealed that clear cell RCC was most frequently associated with SM. Finally, tumor size represented an independent predictor of SM in multivariate regression models adjusted for age, gender, histological subtype and year of diagnosis quartiles.

**Conclusion:** Our study confirmed that tumor size represents an important determinant of the likelihood of SM in patients with T1a and T1b RCC. The rate of SM directly increases with increasing tumor size. Even patients with very small renal masses are at risk of SM. Finally patients with clear cell RCC are at highest risk of SM.

## P125

### Conditional Survival Predictions After Nephrectomy for Renal Cell Carcinoma

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**Table 1. Surgical Outcomes**

	Lap Radical (n=5)	Lap Partial (n=3)
Estimated blood loss (ml)	474 (20-1000)	317 (300-350)
Operative time (min)	274 (159-327)	212 (170-275)
Depth of invasion (cm)	Not applicable	3.2
Warm ischemia time (min)	Not applicable	31 (13-50)
Intraop complications (number)	Pneumothorax (1)	None
Postoperative complications (number)	Bile leak from liver (1), Urinary retention (1), DVT (2)	None
Hospital stay (days)	1.8 (1-4)	1.3 (1-2)
pT stage (number)	T2 (3), T3 (1), T4(1)	T1a (3)
pN stage	N0 (4), N2 (1)	N0 (1), Nx (2)
No. of nodes examined	16 (12-24)	9

**Introduction and Objective:** Conditional survival implies that on average long-term cancer survivors have better prognosis than newly diagnosed individuals. Our objective was to explore the effect of conditional survival in renal cell carcinoma (RCC).

**Materials and Methods:** The analyses relied on 3,560 patients with RCC of all stages treated with nephrectomy (NT). We applied the conditional survival methodology to a previously reported post-treatment nomogram predicting survival after NT for patients with stages I-IV RCC. We relied on the same predictor variables that were integrated in the original multivariable Cox regression models, namely TNM stages, Fuhrman grade, tumor-size, and symptom classification. To validate our new conditional survival nomogram, we relied on an independent cohort of 3,560 patients from 15 institutions, who were not included in the original development cohort.

**Results:** The 5-year survival of patients immediately after NT was 74.2%. It increased to respectively 80.4, 85.1, 90.6 and 89.6% for RCC-survivors at 1, 2, 5 and 10 years after NT. The predicted probabilities varied by as much as 50%, when for example predictions of RCC-specific mortality at 10 years were made after NT vs. 5 years later. Within the external validation cohort, the accuracy of the conditional nomogram was 89.5, 90.5, 88.5 and 86.7% at 1, 2, 5 and 10 years after nephrectomy.

**Conclusion:** We developed (n=2,530) and externally validated (n=3,560) a conditional nomogram for predicting RCC-specific mortality that allows to account for length of survivorship after NT with 89.5, 90.5, 88.5 and 86.7% accuracy at 1, 2, 5 and 10 years after NT. To date no such model exists and our tool provides the most realistic prognosis estimates, with high accuracy.

## P126

### Prognostic Significance of Lymph Node Invasion in Patients with Metastatic Renal Cell Carcinoma: A Population-Based Perspective

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**Introduction and Objective:** Virtually all staging schemes aimed at predicting or stratifying the prognosis of surgically-treated patients diagnosed with metastatic renal cell carcinoma (mRCC) omit the use of nodal status. We tested the prognostic significance of nodal status in patients with mRCC within a large population-based cohort of patients from the United States, to assess whether the inclusion of nodal status could improve the accuracy of cancer-specific mortality (CSM) predictions.

**Materials and Methods:** Within the SEER database, we identified 797 patients treated with cytoreductive nephrectomy and lymphadenectomy for mRCC. Of those, 42.9% had lymph node metastases. Prognostic stratification according to the Kaplan-Meier method was performed according to the variable defining nodal status. Subsequently, we relied on univariable and multivariable Cox regression analyses to test the statistical significance and the independent predictor status of nodal status, Fuhrman grade, tumor size, year of surgery, race, gender, and age.

**Results:** At 3 years after cytoreductive nephrectomy (CNT), the CSM-free rate of lymph node negative vs. lymph node positive patients was respectively 34.7% vs. 14.4% (p<0.001). Nodal status represented the most informative variable and achieved independent predictor status in all the multivariable models (p<0.001). The consideration of nodal status added 3.2% accuracy to other tested predictors of CSM.

**Conclusion:** Our findings clearly indicate that nodal status should be considered in prognostic models. The TNM staging of mRCC patients should also include the status of loco-regional lymph nodes, since the 3-years CSM rates of node negative and node positive mRCC patients differ by as much as 20%.

## P127

### Pushing the Limits of Partial Nephrectomy: Time to Pause?

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**Introduction and Objective:** In patients with T1a (≤4cm) renal cell carcinoma (RCC), relative to radical nephrectomy (RN), partial nephrectomy (PN) protects from surgically induced renal insufficiency and protects from other-cause mortality. We tested whether the same effect applies to T1b (4-7 cm) tumors.

**Materials and Methods:** A series of database allowed us to identify 275 PN (5.3%) and 4866 RN (94.7%) patients treated for T1bN0M0 RCC between 1988 and 2004. Analyses, matched for age, year of surgery, tumor size and Fuhrman grade, addressed the effect of nephrectomy type (RN vs. PN) on overall survival (Cox regression models) and on other-cause mortality (competing-risks regression models).

**Results:** Cox regression models that were based on matched PN and RN cases demonstrated no difference in overall survival according to surgery type. Similarly, no difference was recorded in competing-risks regression models that addressed other-cause mortality after adjustment for cancer-related deaths.

**Conclusion:** To date, it is not known whether PN or RN should be performed in patients with T1bN0M0 RCC. Our report is the largest and the most conclusive with regard to the absence of overall survival and other-cause mortality benefit for PN vs. RN. Prospective trials are needed to corroborate or refute our findings.

## P128

### A Population-Based Analysis of the Rate of Cytoreductive Nephrectomy for Metastatic Renal Cell Carcinoma in the United States

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**Introduction and Objective:** Cytoreductive nephrectomy (CNT) improves survival in patients with metastatic renal cell carcinoma (mRCC). We examined temporal, geographical, socio-economic and clinical determinants of CNT use in a series of database.

**Materials and Methods:** Within the examined series of database, we identified 6226 mRCC patients, who were either treated with CNT (n=2038) or underwent no surgery (n=4188) between 1989 and 2004. Chi-square and chi-square trend tests, as well as multivariable logistic regression models were used to assess the effect of age, gender, race, region of residence, and year of surgery on the rate of CNT. Adjustment was made for the size of the primary tumor.

**Results:** The overall rate of CNT was 30.5%. The rate of CNT increased in the most recent year quartile (p<0.001), was more frequent in white patients (p=0.005), in males (p=0.001), and in younger patients (p<0.001). Moreover, CNT was more frequently performed for larger primary tumors (p<0.001). Finally, important variability existed in the rate of CNT between the different examined databases (range 29.5-38.6%, p=0.002). In multivariable logistic regression models, age (p<0.001), race (p<0.001), the year of surgery (p<0.001), primary tumor size (p<0.001), and region (p=0.003) were independent predictors of CNT rate.

**Conclusion:** Racial and geographic variability in CNT rates is worrisome and warrants further attention. In view of the survival benefits of CNT, its access should be equal for all races and regions.

**P129****Tumor Necrosis is not an Informative Marker of Cancer-Specific Mortality in Patients with all Stages of Renal Cell Carcinoma**

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**Introduction and Objective:** Presence of tumor necrosis (TN) within the nephrectomy specimen represents an established pathological marker and an important predictor of cancer-specific mortality (CSM). Several prognostic schemes also rely on TN for prediction of CSM estimates. We tested whether TN could improve the prognostic ability of one of the most accurate prognostic tools for patients with renal cell carcinoma (RCC), which relies on 6 established CSM predictors.

**Materials and Methods:** Retrospective analysis of 1526 patients with all stages of RCC who were treated with radical or partial nephrectomy in 6 European institutions. Univariable and multivariable Cox-regression models tested for statistical significance of TN in CSM predictions. Covariates consisted of TNM stage, Fuhrman grade, tumor-size, and symptom classification. Analyses first addressed the entire patient population (n=1526) and were then repeated in patients with exclusive clear cell histology (n=1320). Harrell's concordance index quantified accuracy.

**Results:** TN was present in 476 patients (31.2%). TN was a statistically significant predictor of CSM (hazard ratio [HR]: 2.73; p<0.001) but not an independent predictor of CSM (adjusted HR: 0.88; p=0.4). Accuracy of TN ranked 6<sup>th</sup> of seven tested predictors of CSM and failed to improve the accuracy of other variables. The same results were recorded in patients with exclusive clear cell histology.

**Conclusion:** TN does not improve the accuracy of the established and most accurate predictors of CSM in patients with RCC of all stages, including patients with clear cell histology. In consequence, models that rely on TN could potentially be improved with the addition of other prognostic variables.

**P130****Can Renal Mass Biopsy Assessment of Tumor Grade Be Safely Substituted with a Predictive Model?**

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**Introduction and Objective:** Fuhrman grade (FG) represents one of the key determinants of the natural history of small renal masses (SRMs). We tested whether renal mass biopsy (RMB) prediction of FG within the nephrectomy specimen could be safely substituted with an accurate statistical model. To date the best available model showed poor accuracy (55.6%), which is close to a flip of a coin (50%) and clearly inadequate for use in clinical practice.

**Materials and Methods:** Between years 1989 to 2004, 1139 patients with T1aN0M0 treated with either partial or radical nephrectomy were identified at eleven participating institutions. This cohort was used in univariable and multivariable logistic regression models that predicted the presence of high Fuhrman grade (FG III-IV) at nephrectomy. Predictors consisted of age at diagnosis, gender, tumor size and symptom classification. Multivariable logistic regression coefficients were then used to generate a nomogram.

**Results:** The rate of FG III-IV in patients with T1aN0M0 RCC was 12.3%. Stratification of patients with FG III-IV according to age, gender, histological subtypes and sample size failed to reveal statistically significant differences. In univariable analyses predicting presence of FG III-IV at nephrectomy, only tumor size (p=0.05) represented a statistically significant

predictor. Of all tested predictors only tumor size (p=0.009) achieved independent predictor status. The most accurate multivariable nomogram for FG III-IV prediction was 57.4% accurate.

**Conclusion:** Our analysis derived from European patients, showed that statistical models cannot safely replace RMB-based prediction of FG III-IV. Our findings corroborate a report from the United States, where a similar model revealed 55.6% accuracy. Jointly, the studies indicate that statistical models are unreliable and cannot safely substitute RMB in North American as well as European patients.

**P131****For T1aN0M0 Renal Cell Carcinoma, Nephron-Sparing Surgery has the Same Cancer Control than Radical Nephrectomy: A Population-Based Assessment**

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**Introduction and Objective:** It is widely accepted that nephron-sparing surgery (NSS) and radical nephrectomy (RN) achieve same cancer control for T1a (<4cm) renal cell carcinoma. However, this affirmation relied on a limited cohort. We decided to reassess the effect of NSS vs. RN on cancer-specific mortality (CSM) in a large population-based cohort.

**Materials and Methods:** The database allowed us to identify 1622 PN (22.3%) and 5658 RN (77.7%) patients treated for T1aN0M0 RCC between 1988 and 2004. Analyses, matched for age, year of surgery, tumor size and Fuhrman grade, addressed the effect of nephrectomy type (RN vs. NSS) on CSM.

**Results:** At 5 years of follow-up, in a population of NSS and RN cases matched for age, year of surgery, tumor size and Fuhrman grade, the freedom for CSM rate in NSS versus RN patients was 98.2 versus 97.3%. Cox regression models that were based on matched PN and RN cases demonstrated no difference in cancer specific survival according to surgery type. Similarly, no difference was recorded in competing-risks regression models that addressed CSM, after adjustment for non-cancer-related deaths.

**Conclusion:** Our findings, population based and about the largest published cohort of NSS cases performed for T1a lesions, corroborate the cancer control equivalence of NSS vs. RN for T1aN0M0 lesions. In consequence, NSS should be given further consideration when surgical decisions are made for T1a lesions.

**P132****A Comparative Population-Based Analysis of the Rate of Partial vs. Radical Nephrectomy for Clinical Localized Renal Cell Carcinoma**

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**Introduction and Objective:** Among other considerations, a survival benefit due to avoidance of surgically induced renal insufficiency distinguishes partial nephrectomy (PN) from radical nephrectomy (RN). We examined contemporary (1989 to 2004) PN trends within a large population-based database.

**Materials and Methods:** Diagnostic, stage and surgical codes focused on patients with T1-2 N0 M0 renal cell carcinoma (RCC) treated with either PN or RN. Proportions, trends and multivariable logistic regression models tested the predictors of PN use.

**Results:** Of 19733 assessable patients, 2614 (13.2%) and 17119 (86.8%) respectively underwent PN or RN. PN use decreased with increasing tumor size ( $p < 0.001$ ), was more frequent in younger patients ( $p < 0.001$ ) and increased with more contemporary years of surgery ( $p < 0.001$ ). Intriguingly, important geographic variability was recorded ( $p < 0.001$ ). For example, the absolute PN rate was 16.4% vs. 7.6% in two of the examined regions ( $p < 0.001$ ). In multivariable analyses, tumor size, age, year of surgery, gender and region represented independent predictors of PN use.

**Conclusion:** Although expectedly the rate of PN use increased over time, unexplained variability remained. For example, gender and regions affect the likelihood of PN. These variables warrant further analyses to reduce unnecessary variability and to maximize PN use and its benefit.

### P133

#### Nephron-Sparing Surgery is Equally Effective to Radical Nephrectomy for T1bN0M0 Renal Cell Carcinoma: A Population-Based Assessment

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**Introduction and Objective:** To date, only few series from tertiary care centers supported the use of nephron-sparing surgery (NSS) for T1bN0M0 (range from 4 to 7 cm) renal cell carcinoma (RCC). We decided to test the effect of NSS vs. radical nephrectomy (RN) on cancer specific mortality (CSM) in patients with T1bN0M0 RCC in a population-based cohort.

**Materials and Methods:** We identified 275 NSS (5.3%) and 4866 RN (94.7%) patients treated for T1bN0M0 RCC between 1988 and 2004 within a large population-based cohort. Analyses, matched for age, year of surgery, tumor size and Fuhrman grade, addressed the effect of nephrectomy type (NSS vs. RN) on CSM.

**Results:** At 5 years after surgery, the surviving proportion in the age, gender, tumor size, and year of surgery matched cohort of NSS and RN cases was respectively 91.4 and 95.3% and 90.1 and 93.8% in the cohort of NSS and RN cases where additional matching for Fuhrman grade was performed. Neither of the matched analyses resulted in statistically significant CSM difference ( $p = 0.1$  and  $0.4$ ) between NSS and RN. Similarly, competing-risk regression analyses based on both matching schemes also failed to reveal statistically significant CSM differences ( $p = 0.3$  and  $0.3$ ).

**Conclusion:** Our study represents the largest and the only population-based analysis of cancer control efficacy of NSS vs. RN in T1bN0M0 RCC. It indicates that NSS does provide equivalent cancer control relative to RN. In consequence, based on cancer control equivalence, NSS should be given equal consideration for surgical treatment decisions of T1bN0M0 lesions.

### P134

#### Simplified Fuhrman Grade is Equally Informative to the Conventional Fuhrman Grade: A Population-Based Analysis

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**Introduction and Objective:** The conventional Fuhrman grading system, which categorizes renal cell carcinoma (RCC) into four tiers between grades I, II, III and IV, is the most widely used predictor assessment of RCC cancer-specific mortality (CSM). The aim of this study was to test the prognostic ability of simplified Fuhrman grading schemes (FGS), which rely on two or three-tiered classifications.

**Materials and Methods:** The current study addressed a population of 14064 patients with clear cell RCC, who were treated with partial or radical nephrectomy between 1988 and 2004, within a multi-regional database. Univariable and multivariable analyses, as well as prognostic accuracy analyses, were performed for various FGS to test their ability in predicting CSM rates. The conventional four-tiered FGS was compared to a modified two-tiered FGS where grades I and II vs. III and IV were combined. A second simplified three-tiered FGS where grades I and II were combined vs. III and IV were kept separate, was also tested.

**Results:** The overall five-year CSM free rate was 81.5%. All three FGS achieved independent predictor status in multivariable analyses. Prognostic accuracy of multivariable models that relied on various FGSs was as follows: 83.6% for the modified two-tiered FGS and 83.8% for both the conventional four-tiered and modified three-tiered FGS.

**Conclusion:** Our findings indicate that simplified FGS perform equally well to the conventional four-tiered FGS. The use of simplified grading schemes may represent an advantage for pathologists, as well as clinicians caring for patients with RCC.