Υπολογιστές ογκολογικού κινδύνου: Καρκίνος Νεφρού - Ουροδόχου Κύστης

Χαράλαμπος Κ. Μαμουλάκης

Λέκτορας Ουρολογίας

Ουρολογική Κλινική

Πανεπιστημιακό Γενικό Νοσοκομείο Ηρακλείου

Πανεπιστήμιο Κρήτης, Τμήμα Ιατρικής

ΚΑΡΚΙΝΟΣ ΝΕΦΡΟΥ

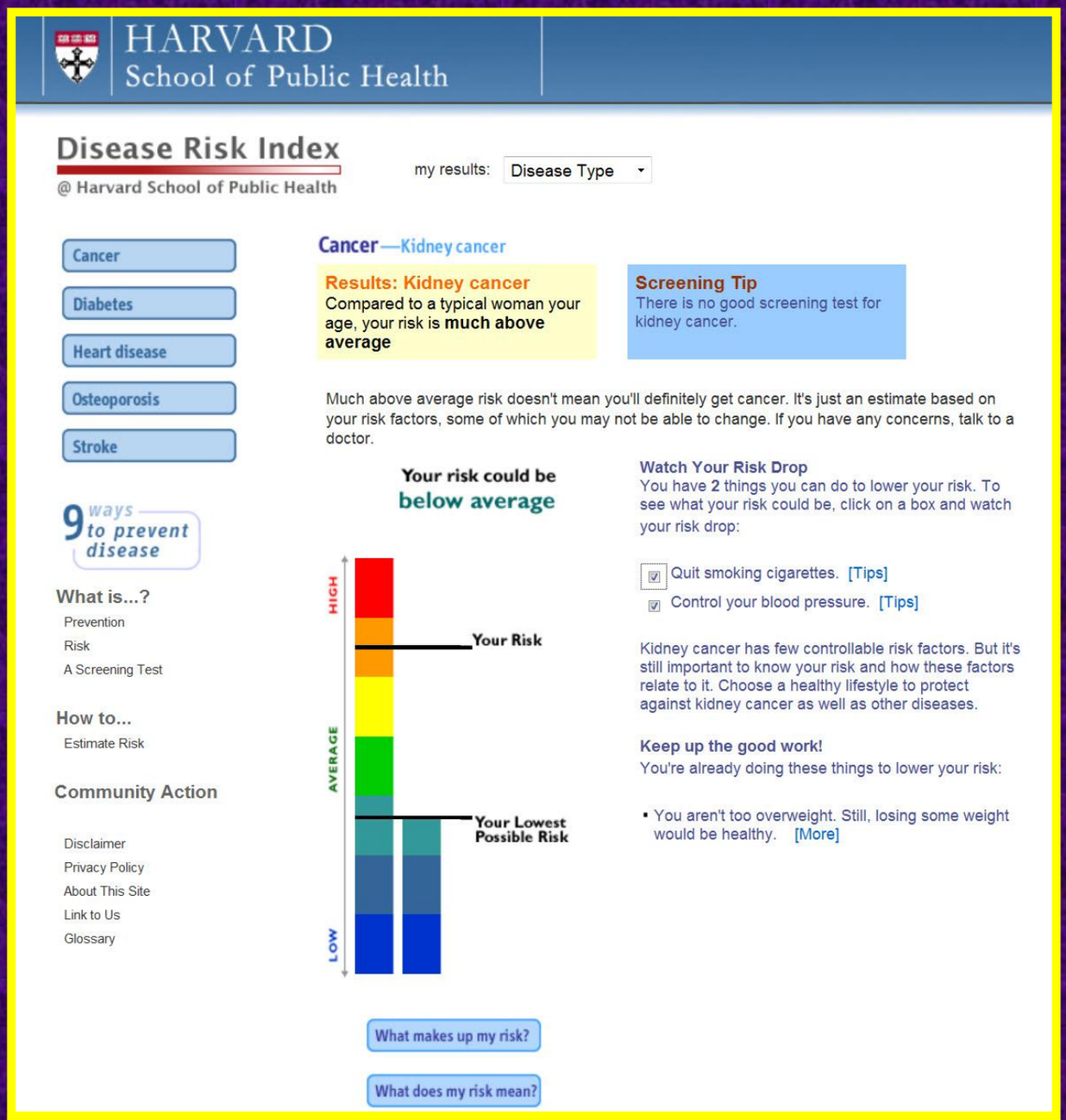
Κλινικό παράδειγμα 1

- γυναίκα, 61 ετών
- (-) ατομικό αναμνηστικό για καρκίνο
- αδελφός έχει πεθάνει από καρκίνο νεφρού
- ύψος = 170 cm, βάρος = 75 Kg
- καπνίστρια (≈ 30 τσιγάρα ημερησίως)
- Υπέρταση, υπερχοληστεριναιμία

http://www.diseaseriskindex.harvard.edu/update/hccpquiz.pl?lang=english&func=home&quiz

Harvard Report on Cancer Prevention, Volume 4: Harvard Cancer Risk Index

✓ Εκτίμηση κινδύνου και πρόληψη (γενικός πληθυσμός)



http://www.diseaseriskindex.harvard.edu/update/hccpquiz.pl?lang=english&func=home&quiz

Harvard Report on Cancer Prevention, Volume 4: Harvard Cancer Risk Index

Κλινικό παράδειγμα 1

- σύσταση διακοπής καπνίσματος
- σύσταση για παρακολούθηση και ρύθμιση της ΑΠ
- τυχαίος έλεγχος με US: ύποπτη μάζα στο δεξιό νεφρό
- CT : συμπαγής όγκος 2,9 cm με σκιαγραφική ενίσχυση
- (-) απεικονιστικά στοιχεία νέκρωσης
- (-) ένδειξη λεμφαδενικών/απομακρυσμένων μεταστάσεων

✓ Προεγχειρητικά νομογράμματα

- σταδιοποίηση
- κακοήθεια μικρού νεφρικού όγκου (cT1)
- επιθετικότητα όγκου (Fuhrman grade 3-4)
- κακοήθεια και επιθετικότητα όγκου
- λεμφαδενικές μεταστάσεις κατά τη διάγνωση
- απομακρυσμένες μεταστάσεις κατά τη διάγνωση
- ειδική θνητότητα από τον καρκίνο σε σχέση με άλλα αίτια
- άμεση θνητότητα μετά από νεφρεκτομή (30 ημέρες)
- ειδική καρκινική θνητότητα μετά νεφρεκτομή (10-ετία)
- 12-ετής επιβίωση ελεύθερη νόσου

Σταδιοποίηση (TNM 2009)

NOMOGRAMS

Doctor | Patient

Questions or Comments? | Have a nomogram you would like us to operationalize?

Doctor's Menu > AJCC Version 7 TNM Staging > TNM v7 Staging for Kidney

Tumor Staging – Kidney AJCC v7

Pathologic Staging (pTNM)

AJCC/UICC TNM, 7th edition

Protocol web posting date: October 2009

Kidney | Prostate | Bladder | Testicular | Adrenal | Renal Pelvis | Penile

Hide Result | Print Result

Tumor	Node	Metastasis
TX	NX	MX
T0	N0	M0
T1	N1	M1
T1a		
T1b		
T2		
T2a		
T2b		
T3		
T3a		
T3b		

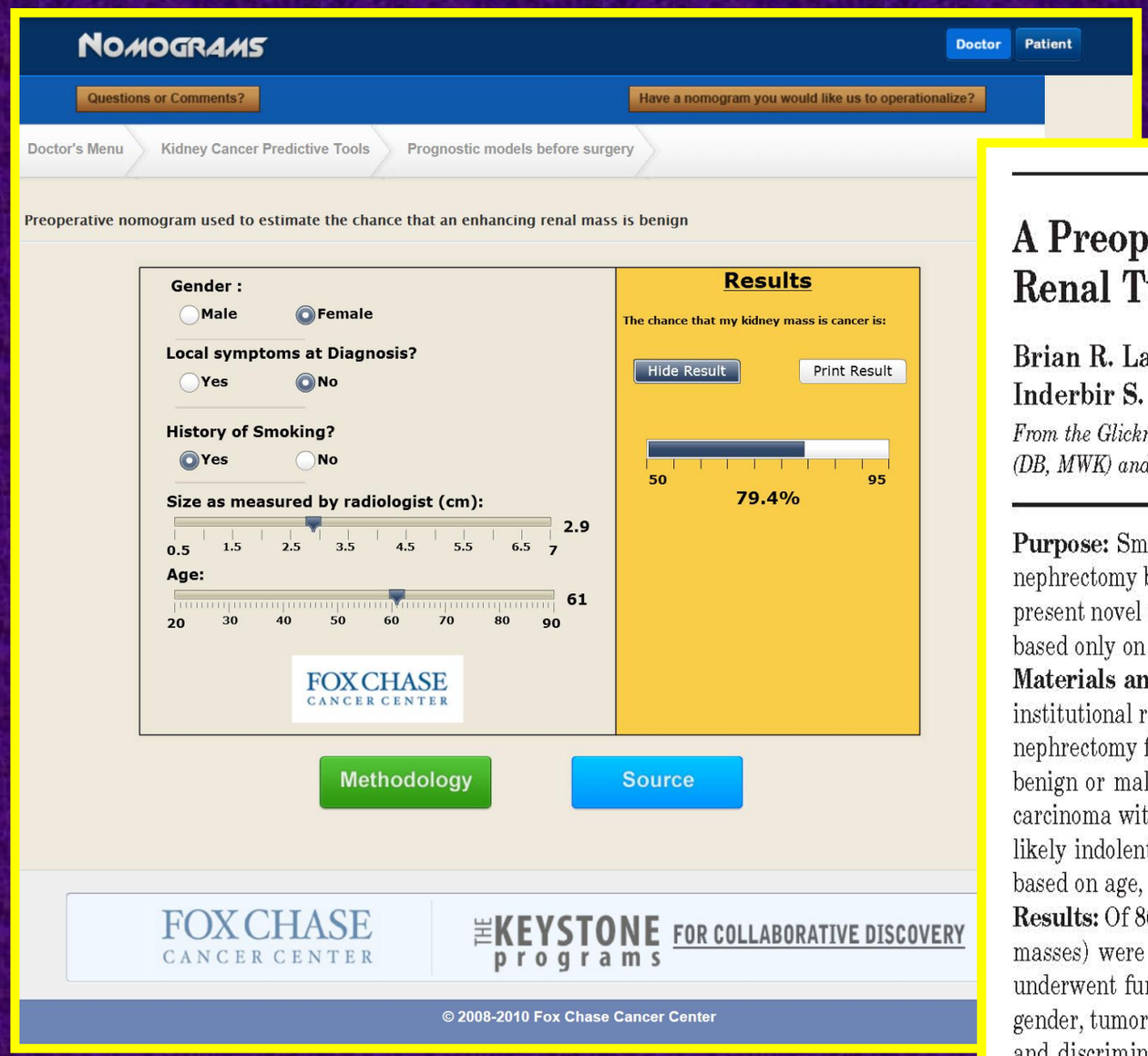
FOX CHASE CANCER CENTER

Tumor	Node	Metastasis
TX	Primary tumor cannot be assessed	
T0	No evidence of primary tumor	
T1	Tumor 7 cm or less in greatest dimension, limited to the kidney	
T1a	Tumor 4 cm or less in greatest dimension, limited to the kidney	
T1b	Tumor more than 4 cm but not more than 7 cm in greatest dimension, limited to the kidney	
T2	Tumor more than 7 cm in greatest dimension, limited to the kidney	
T2a	Tumor more than 7 cm but less than or	

Result:		
Stage I	**T1a**	Tumor 4 cm or less in greatest dimension, limited to the kidney
	N0	No regional lymph node metastasis
	M0	No evidence of distant metastasis

http://labs.fccc.edu/nomograms/nomogram.php?id=50&audience=1

Πιθανότητα κακοήθειας μικρού νεφρικού όγκου (cT1)



A Preoperative Prognostic Nomogram for Solid Enhancing Renal Tumors 7 cm or Less Amenable to Partial Nephrectomy

Brian R. Lane, Denise Babineau, Michael W. Kattan, Andrew C. Novick, Inderbir S. Gill, Ming Zhou, Christopher J. Weight and Steven C. Campbell*

From the Glickman Urological Institute (BRL, DB, CAN, ISG, MZ, CJW, SCC) and Departments of Quantitative Health Sciences (DB, MWK) and Pathology (MZ), Cleveland Clinic, Cleveland, Ohio

Purpose: Small renal masses are increasing in incidence. Most tumors 7 cm or less are treated with radical or partial nephrectomy but clinicians are increasingly relying on ablative therapies and observation for some small renal masses. We present novel nomograms that predict the likelihood of benign, likely indolent or potentially aggressive pathological findings based only on readily identifiable preoperative factors.

Materials and Methods: Information on all partial nephrectomies performed at a single institution was collected in an institutional review board approved registry. Using retrospectively collected data on all 862 patients who underwent partial nephrectomy for a single, solid, enhancing, clinical T1 (7 cm or less) tumor between 1999 and 2005 tumors were classified as benign or malignant. Grade 3 clear cell renal cell carcinoma, grade 4 renal cell carcinoma of any type and any renal cell carcinoma with vascular, fat or collecting system invasion were considered potentially aggressive. The likelihood of benign, likely indolent or potentially aggressive pathological findings was modeled using multivariable logistic regression models based on age, gender, radiographic tumor size, symptoms at presentation and smoking history.

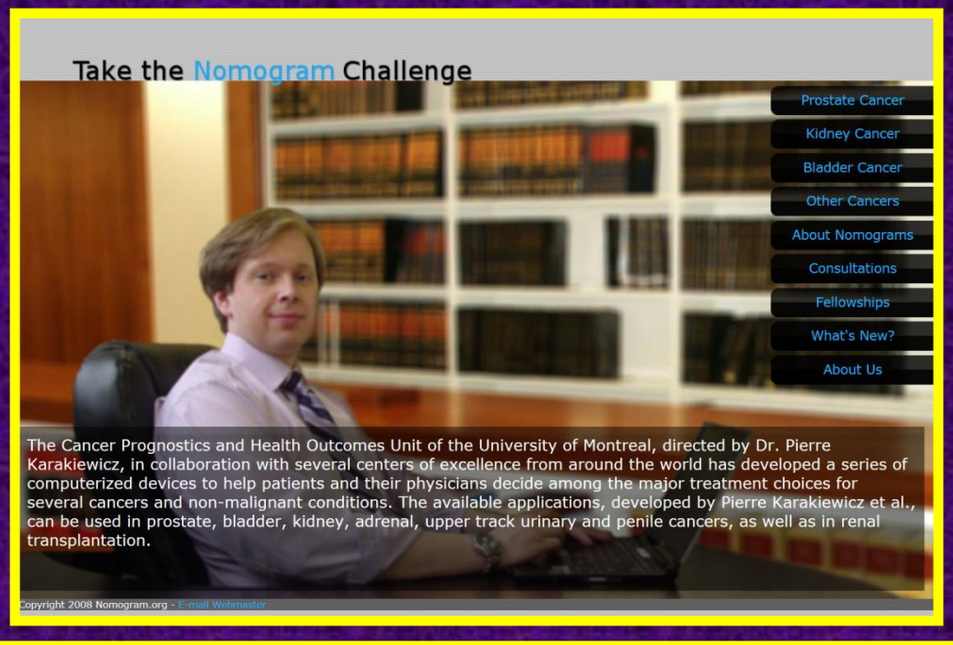
Results: Of 862 small renal masses 20% were benign and 80% were malignant but only 30% of cancers (24% of small renal masses) were potentially aggressive. All 11 patients with systemic symptoms had cancer. The remaining 851 patients underwent further analysis. Factors that were most strongly associated with the likelihood of benign pathology were age, gender, tumor size and smoking history. A nomogram constructed to predict benign histology proved to be relatively accurate and discriminating (bootstrap corrected concordance index 0.644) and calibrated. Small renal masses in older men and younger women were more likely to be benign. With regard to differentiating indolent from potentially aggressive cancers, only advanced age was independently significant on multivariate analysis ($p < 0.005$). The nomogram for this outcome performed with limited ability (concordance index 0.557).

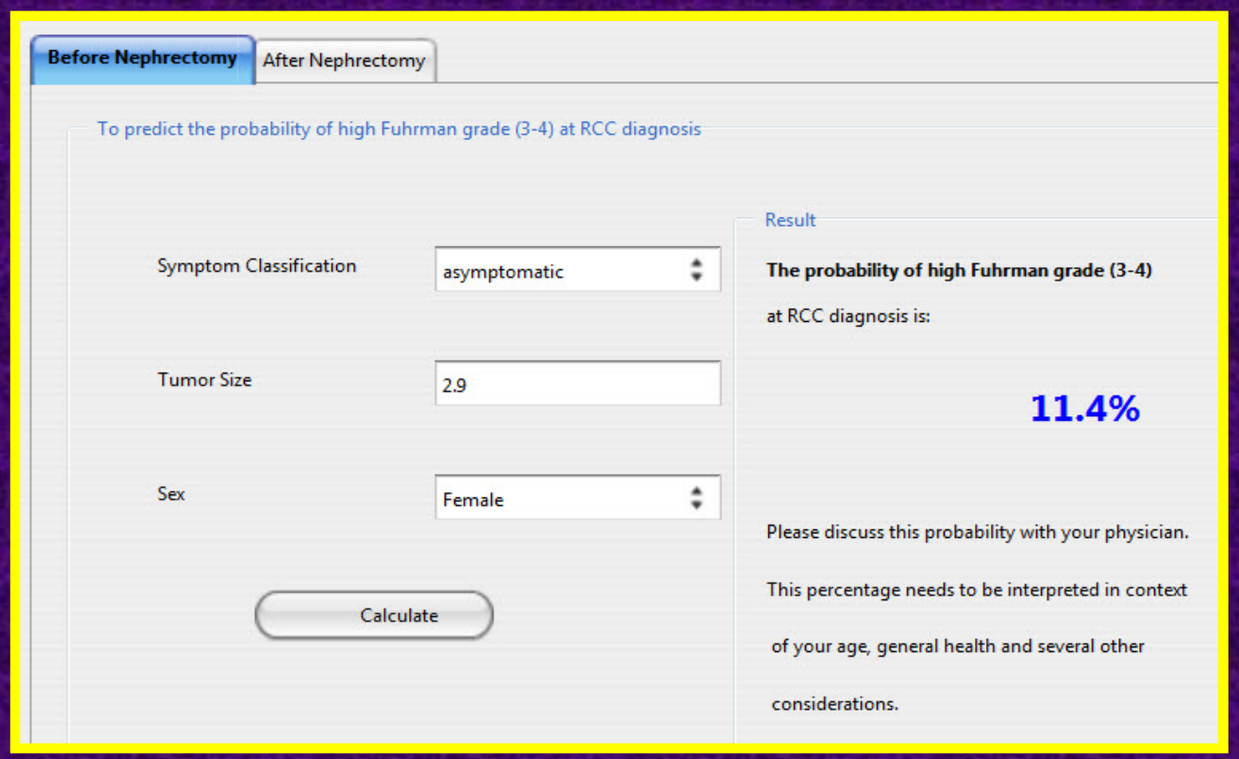
Conclusions: Clinical factors provide substantial predictive ability to predict benign vs malignant pathology for small renal masses amenable to partial nephrectomy. Although most of these small renal masses are benign or indolent, our ability to predict potentially aggressive cancer in this population remains limited.

http://labs.fccc.edu/nomograms/nomogram.php?id=4&audience=1&status=1

Lane BR, et al. J Urol. 2007;178:429-34

Πιθανότητα επιθετικής συμπεριφοράς (Furhman 3-4)





Can Renal Mass Biopsy Assessment of Tumor Grade be Safely Substituted for by a Predictive Model?

Claudio Jeldres, Maxine Sun, Daniel Liberman, Giovanni Lughezzani, Alexandre de la Taille, Jacques Tostain, Antoine Valeri, Luca Cindolo, Vincenzo Ficarra, Walter Artibani, Richard Zigeuner, Arnaud Mejean, Jean Luc Descotes, Eric Lechevallier, Peter F. Mulders, Paul Perrotte, Jean-Jacques Patard and Pierre I. Karakiewicz*

Purpose: Fuhrman grade represents a key determinant of the natural history of small renal masses that represent renal cell carcinoma. We tested whether renal mass biopsy prediction of Fuhrman grade in the nephrectomy specimen could be safely substituted for by an accurate statistical model. To date the best available model has shown poor accuracy (55.6%), which is close to flipping a coin (50%) and clearly inadequate for use in clinical practice.

Materials and Methods: We identified 1,139 patients with T1aN0M0 renal cell carcinoma treated with partial or radical nephrectomy at 11 participating institutions from 1989 to 2004. This cohort was used in univariate and multivariate logistic regression models predicting high Fuhrman grade (III–IV) at nephrectomy. Predictors included age at diagnosis, gender, tumor size and symptom classification. Multivariate logistic regression coefficients were used to generate a nomogram.

Results: The rate of Fuhrman grade III–IV in patients with T1aN0M0 renal cell carcinoma was 12.3%. Stratifying patients with Fuhrman grade III–IV by age, gender, histological subtypes and sample size failed to reveal statistically significant differences. On univariate analysis predicting Fuhrman grade III–IV at nephrectomy only tumor size was a statistically significant predictor ($p = 0.05$). The most accurate multivariate nomogram for Fuhrman grade III–IV prediction was 58.3% (95% CI 57.8–58.9) accurate. Of all tested predictors only tumor size achieved independent predictor status ($p = 0.009$).

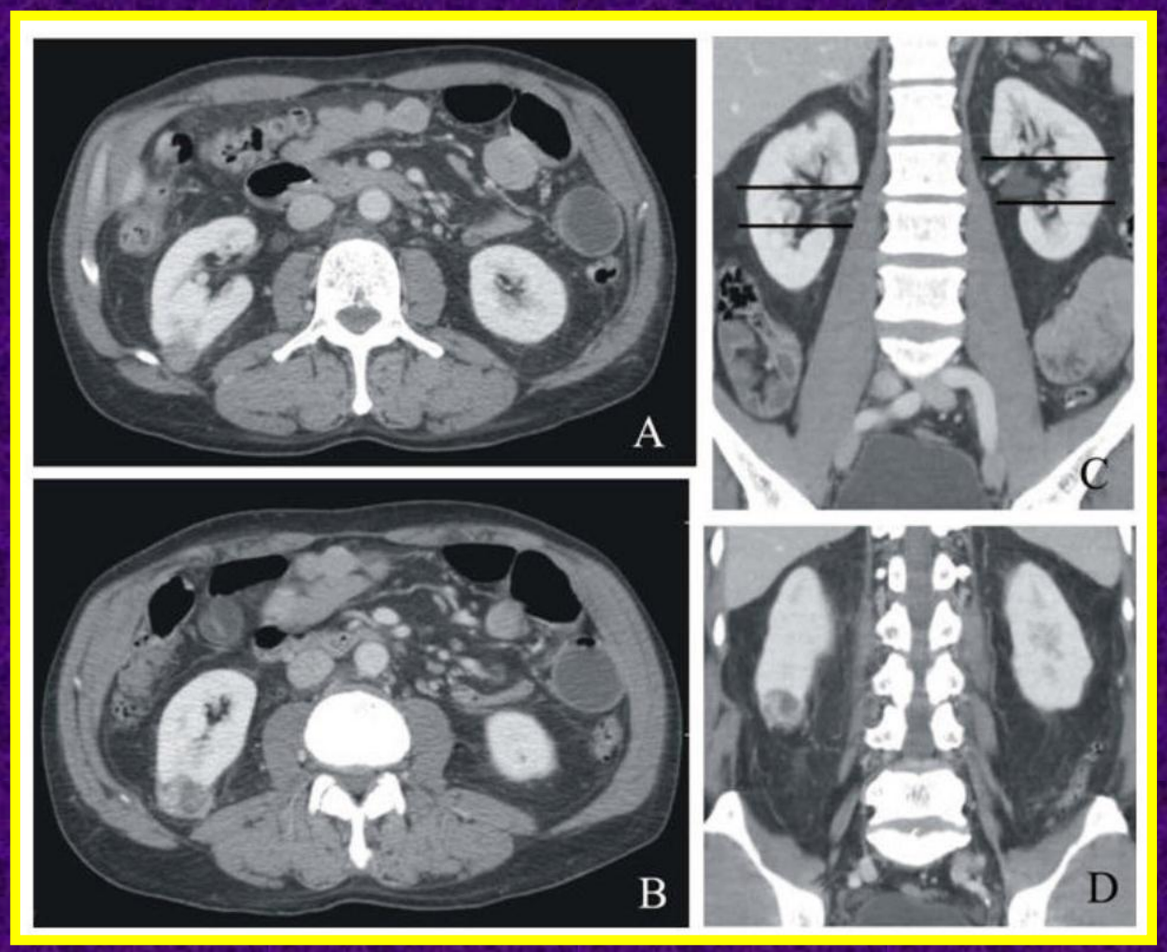
Conclusions: Our analysis derived in European patients shows that statistical models cannot safely replace renal mass biopsy based prediction of Fuhrman grade III–IV at nephrectomy. Our findings corroborate a report from the United States in which a similar model had 55.6% accuracy. Jointly the studies indicate that statistical models are unreliable and cannot safely be substituted for renal mass biopsy in North American or European patients.

http://www.nomogram.org

Lane BR, et al. J Urol. 2007;178:429-34
Jeldres C, et al. J Urol. 2009;182:2585-9

Κλινικό παράδειγμα 1 (συνέχεια)

- CT : συμπαγής όγκος 2,9 cm με σκιαγραφική ενίσχυση



- όγκος εξωφυτικός (> 50%)
- μακριά από πύελο (>7mm)
- οπίσθια εντόπιση
- δεν εφάπτεται στην πύλη
- επεκτείνεται λίγο πάνω από την κάτω πολική γραμμή

Πιθανότητα κακοήθειας - επιθετικότητας (R.E.N.A.L.)

Anatomic Features of Enhancing Renal Masses Predict Malignant and High-Grade Pathology: A Preoperative Nomogram Using the RENAL Nephrometry Score

Alexander Kutikov[a,*], *Marc C. Smaldone*[a], *Brian L. Egleston*[b], *Brandon J. Manley*[a], *Daniel J. Canter*[a], *Jay Simhan*[a], *Stephen A. Boorjian*[a], *Rosalia Viterbo*[a], *David Y.T. Chen*[a], *Richard E. Greenberg*[a], *Robert G. Uzzo*[a]

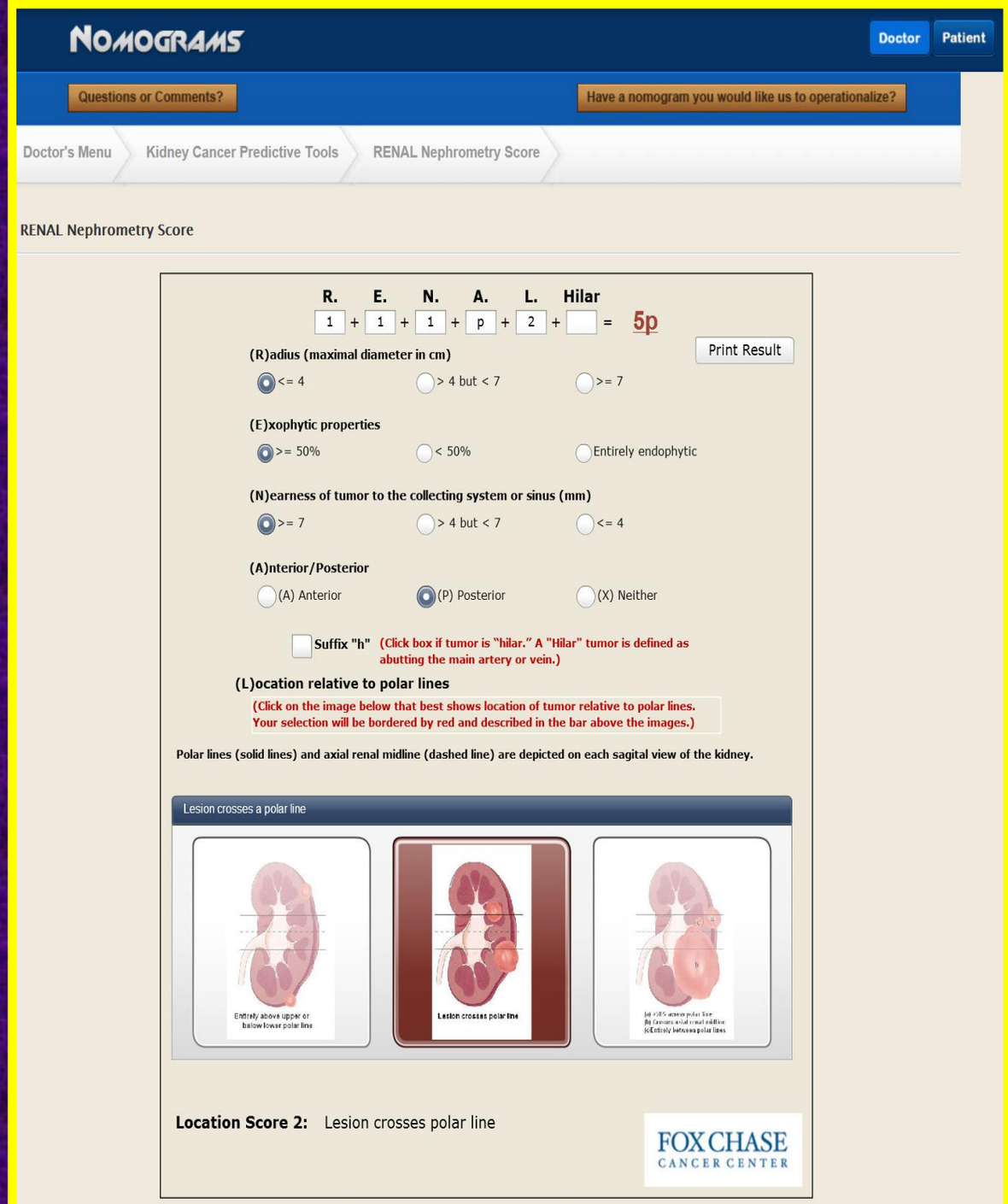
[a] *Division of Urologic Oncology, Department of Surgical Oncology, Fox Chase Cancer Center Philadelphia, PA, USA*
[b] *Department of Biostatistics, Fox Chase Cancer Center, Philadelphia, PA, USA*

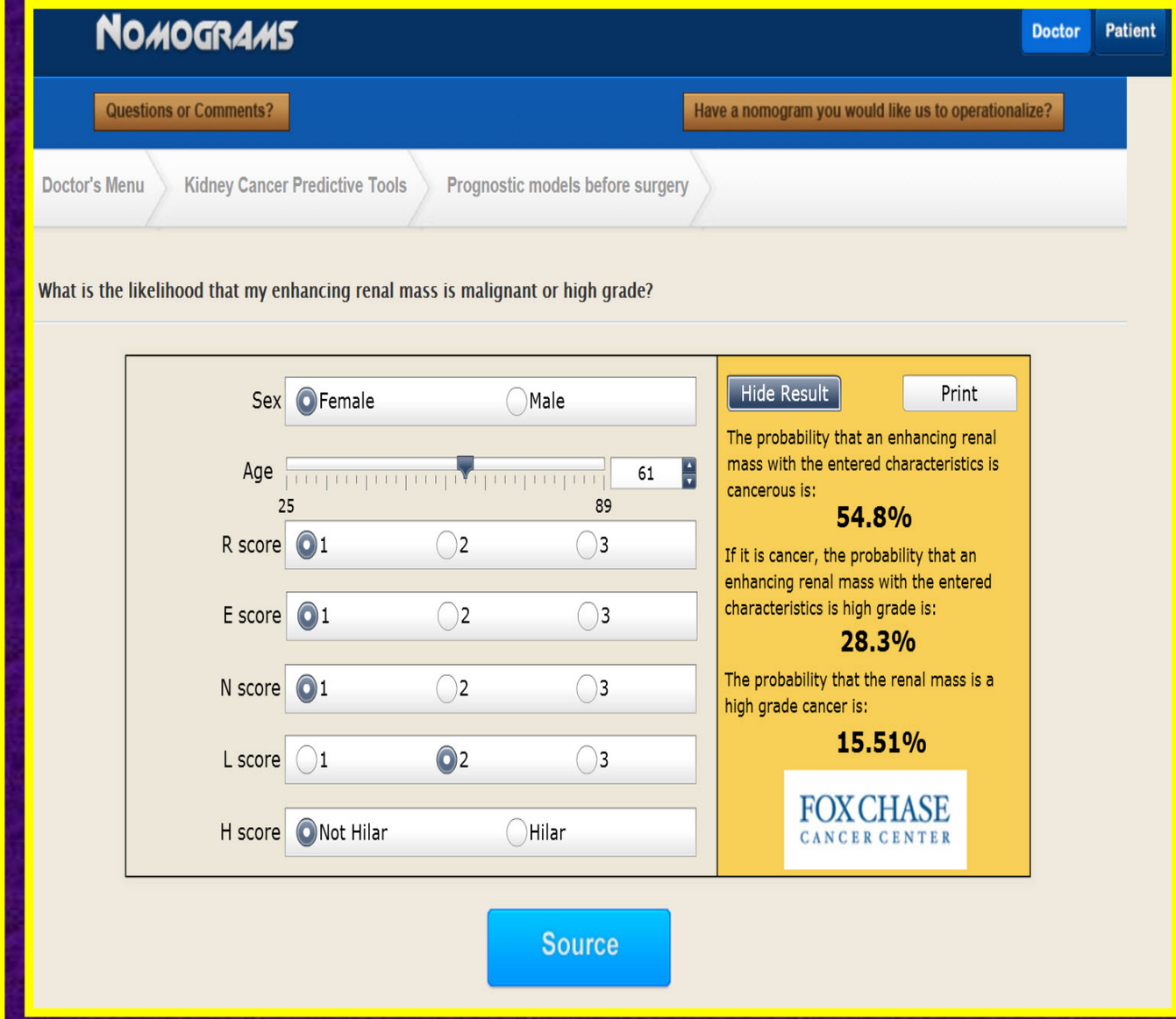
Abstract

Background: Counseling patients with enhancing renal mass currently occurs in the context of significant uncertainty regarding tumor pathology.
Objective: We evaluated whether radiographic features of renal masses could predict tumor pathology and developed a comprehensive nomogram to quantitate the likelihood of malignancy and high-grade pathology based on these features.
Design, setting, and participants: We retrospectively queried Fox Chase Cancer Center's prospectively maintained database for consecutive renal masses where a Nephrometry score was available.
Intervention: All patients in the cohort underwent either partial or radical nephrectomy.
Measurements: The individual components of Nephrometry were compared with histology and grade of resected tumors. We used multiple logistic regression to develop nomograms predicting the malignancy of tumors and likelihood of high-grade disease among malignant tumors.
Results and limitations: Nephrometry score was available for 525 of 1750 renal masses. Nephrometry score correlated with both tumor grade ($p < 0.0001$) and histology ($p < 0.0001$), such that small endophytic nonhilar tumors were more likely to represent benign pathology. Conversely, large interpolar and hilar tumors more often represented high-grade cancers. The resulting nomogram from these data offers a useful tool for the preoperative prediction of tumor histology (area under the curve [AUC]: 0.76) and grade (AUC: 0.73). The model was subjected to out-of-sample cross-validation; however, lack of external validation is a limitation of the study.
Conclusions: The current study is the first to objectify the relationship between tumor anatomy and pathology. Using the Nephrometry score, we developed a tool to quantitate the preoperative likelihood of malignant and high-grade pathology of an enhancing renal mass.

Kutikov A, et al. Eur Urol. 2011;60:241-8

Πιθανότητα κακοήθειας - επιθετικότητας (R.E.N.A.L.)





http://labs.fccc.edu/nomograms/nomogram.php?id=56&audience=1

http://www.nephrometry.com

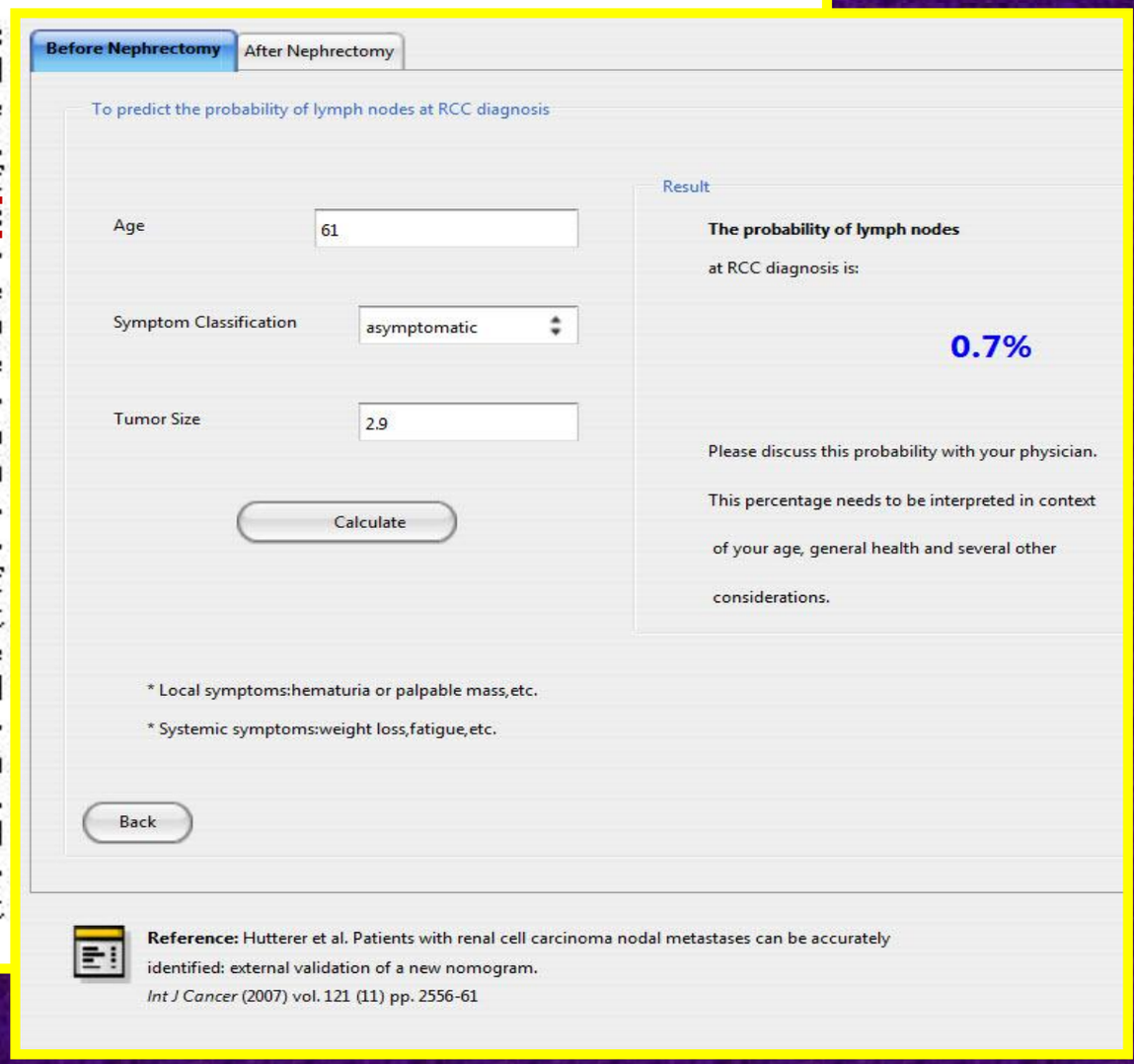
Kutikov A, et al. Eur Urol. 2011;60:241-8

Πιθανότητα λεμφαδενικών μεταστάσεων κατά τη διάγνωση

Patients with renal cell carcinoma nodal metastases can be accurately identified: External validation of a new nomogram

Georg C. Hutterer[1,2], Jean-Jacques Patard[3], Paul Perrotte[4], Constantin Ionescu[1], Alexandre de La Taille[5], Laurent Salomon[5], Gregory Verhoest[3], Jacques Tostain[6], Luca Cindolo[7], Vincenzo Ficarra[8], Walter Artibani[8], Luigi Schips[2], Richard Zigeuner[2], Peter F. Mulders[9], Antoine Valeri[10], Denis Chautard[11], Jean-Luc Descotes[12], Jean-Jacques Rambeaud[12], Arnaud Mejean[13] and Pierre I. Karakiewicz[1,4*]

Outcome of patients with renal cell carcinoma nodal metastases (NM) is substantially worse than that of patients with localized disease. This justifies more thorough staging and possibly more aggressive treatment in those at risk of or with established NM. We developed and externally validated a nomogram capable of highly accurately predicting renal cell carcinoma NM in patients without radiographic evidence of distant metastases. Age, symptom classification, tumour size and the pathological nodal stage were available for 4,658 individuals. The data of 2,522 (54.1%) individuals from 7 centers were used to develop a multivariable logistic regression model-based nomogram predicting the individual probability of NM. The remaining data from 2,136 (45.9%) patients from 5 institutions were used for external validation. In the development cohort, 107/2,522 (4.2%) had lymph node metastases *vs.* 100/2,136 (4.7%) in the external validation cohort. Symptom classification and tumour size were independent predictors of NM in the development cohort. Age failed to reach independent predictor status, but added to discriminant properties of the model. A nomogram based on age, symptom classification and tumour size was 78.4% accurate in predicting the individual probability of NM in the external validation cohort. Our nomogram can contribute to the identification of patients at low risk of NM. This tool can help to risk adjust the need and the extent of nodal staging in patients without known distant metastases. More thorough staging can hopefully better select those in whom adjuvant treatment is necessary.



http://www.nomogram.org

Hutterer GC, et al. Int J Cancer. 2007;121:2556-61

Πιθανότητα απομακρυσμένων μεταστάσεων στη διάγνωση

Patients with distant metastases from renal cell carcinoma can be accurately identified: external validation of a new nomogram

Georg C. Hutterer[1,2], Jean-Jacques Patard[3], Claudio Jeldres[1,4], Paul Perrotte[4], Alexandre de La Taille[5], Laurent Salomon[5], Gregory Verhoest[3], Jacques Tostain[6], Luca Cindolo[7], Vincenzo Ficarra[8], Walter Artibani[8], Luigi Schips[2], Richard Zigeuner[2], Peter F. Mulders[9] and Pierre I. Karakiewicz[1,4]

Study Type – Symptom prevalence study (retrospective cohort study)
Level of Evidence 2b

OBJECTIVE

To identify clinical variables that can accurately predict the presence of distant metastases in patients with renal cell carcinoma (RCC).

PATIENTS AND METHODS

Age, symptom classification, tumour size and the prevalence of distant metastases at diagnosis before nephrectomy were available for 5376 patients with pathologically confirmed RCC. The data of 2660 (49.5%) patients from 11 centres were used to develop a multivariable logistic regression model-based nomogram predicting the individual probability of distant metastases. The remaining data from 2716 (50.5%) patients from three institutions were used for external validation.

RESULTS

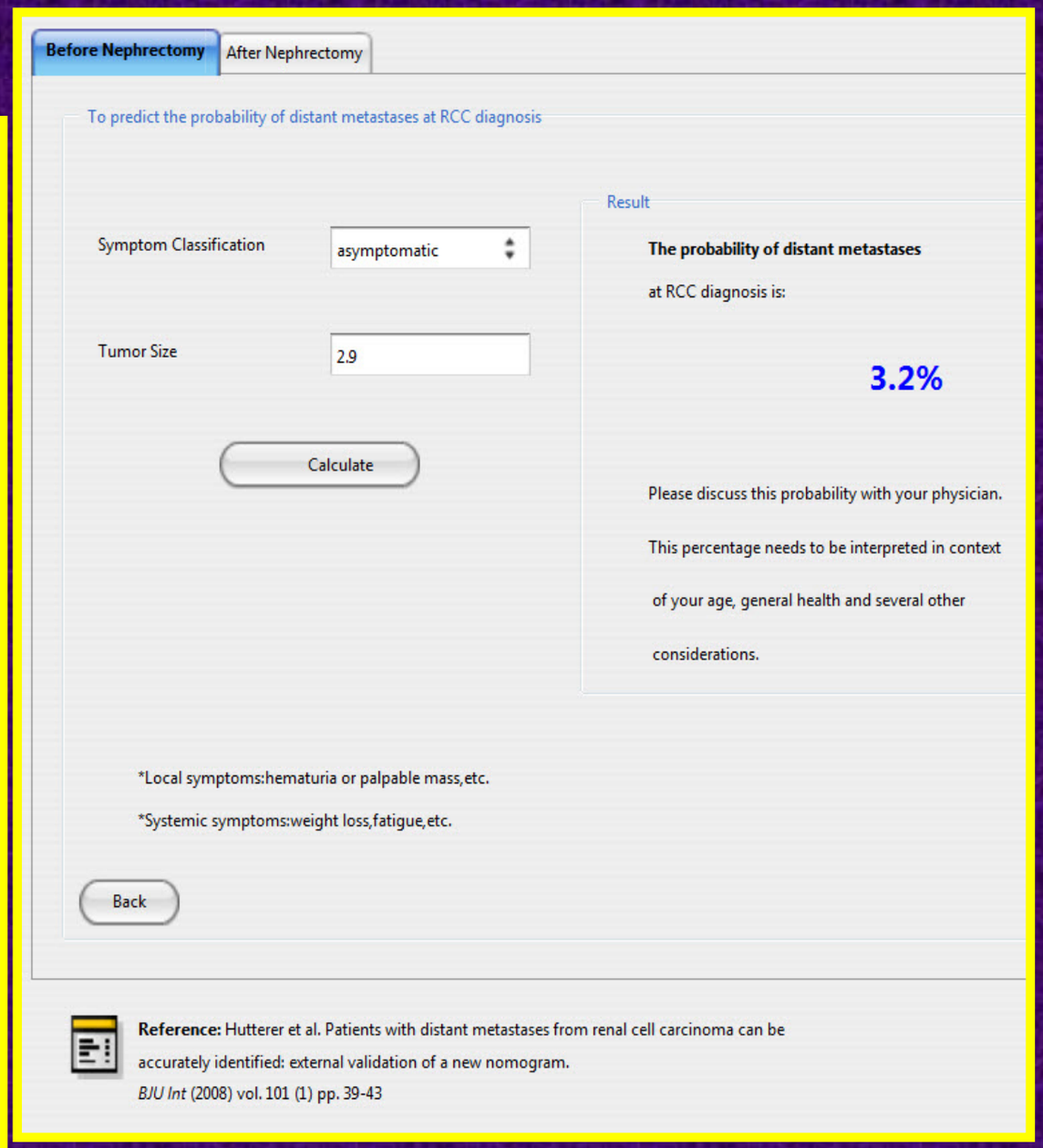
In the development cohort, 269/2660 (10.1%) had distant metastases, vs 285/2716 (10.5%) in the external validation cohort. Symptom classification and tumour size were independent predictors of distant metastases in the development cohort; age was not an independent predictor. A nomogram based on symptom classification and tumour size was 85.2% accurate in predicting the individual probability of distant metastases in the external validation cohort.

CONCLUSION

Although distant metastases might be easily identifiable in some patients, their diagnosis might be a challenge in others. The current nomogram provides a simple, user-friendly and, most importantly, an accurate tool aimed at predicting the probability of distant metastases in patients with RCC.

KEYWORDS

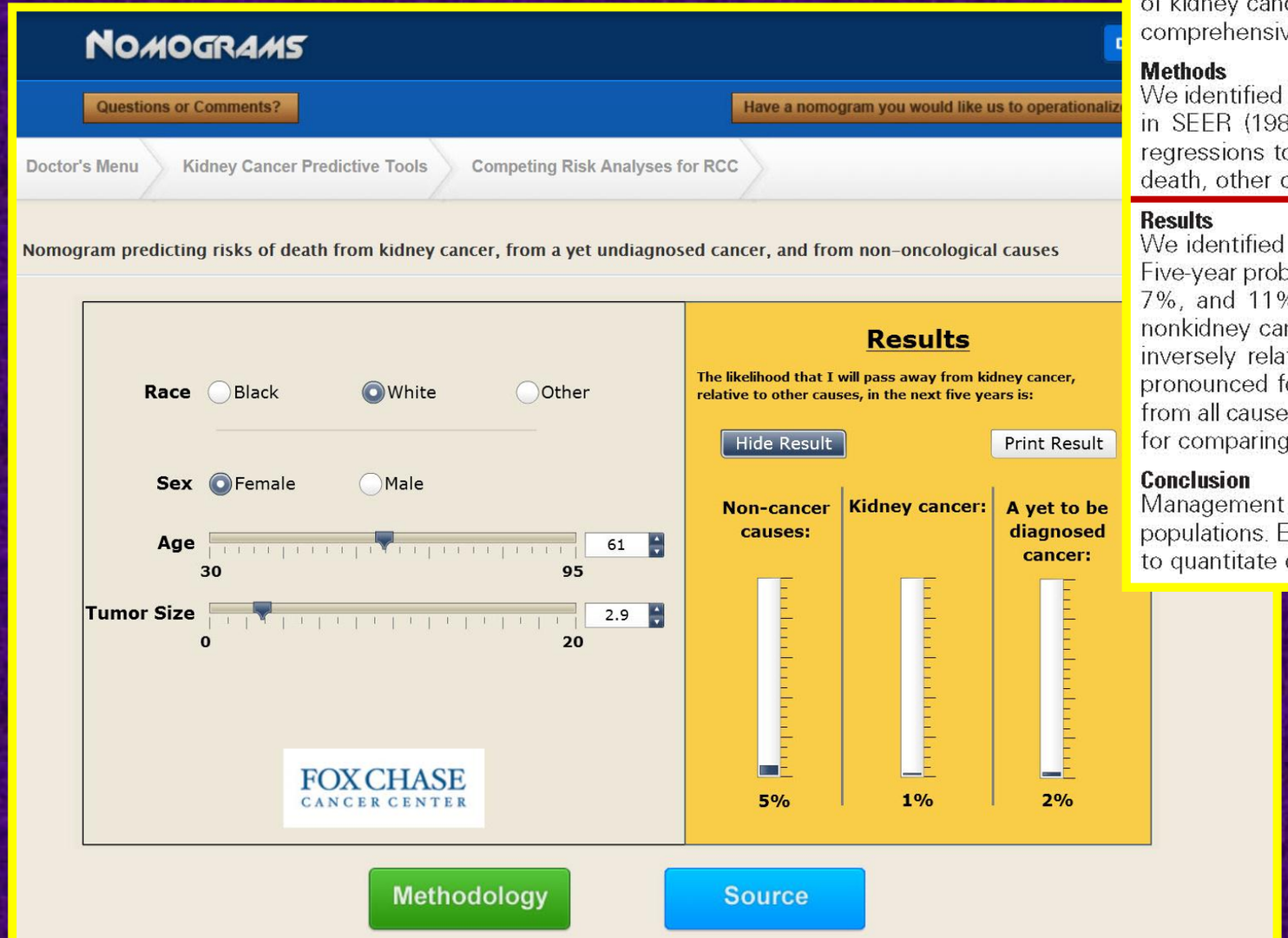
lymph node metastases, renal cell carcinoma, stage, symptom classification



http://www.nomogram.org

Hutterer GC, et al. BJU Int. 2008;101:39-43

Ειδική θνητότητα από τον καρκίνο σε σχέση με άλλα αίτια (5-ετία μετά νεφρεκτομή)



Evaluating Overall Survival and Competing Risks of Death in Patients With Localized Renal Cell Carcinoma Using a Comprehensive Nomogram

Alexander Kutikov, Brian L. Egleston, Yu-Ning Wong, and Robert G. Uzzo

A B S T R A C T

Purpose
Many patients with localized node-negative renal cell carcinoma (RCC) are elderly with competing comorbidities. Their overall survival benefit after surgical treatment is unknown. We reviewed cases in the Surveillance, Epidemiology, and End Results (SEER) database to evaluate the impact of kidney cancer versus competing causes of death in patients with localized RCC and develop a comprehensive nomogram to quantitate survival differences.

Methods
We identified individuals with localized, surgically treated clear-cell, papillary, or chromophobe RCC in SEER (1988 through 2003). We used Fine and Gray competing risks proportional hazards regressions to predict 5-year probabilities of three competing mortality outcomes: kidney cancer death, other cancer death, and noncancer death.

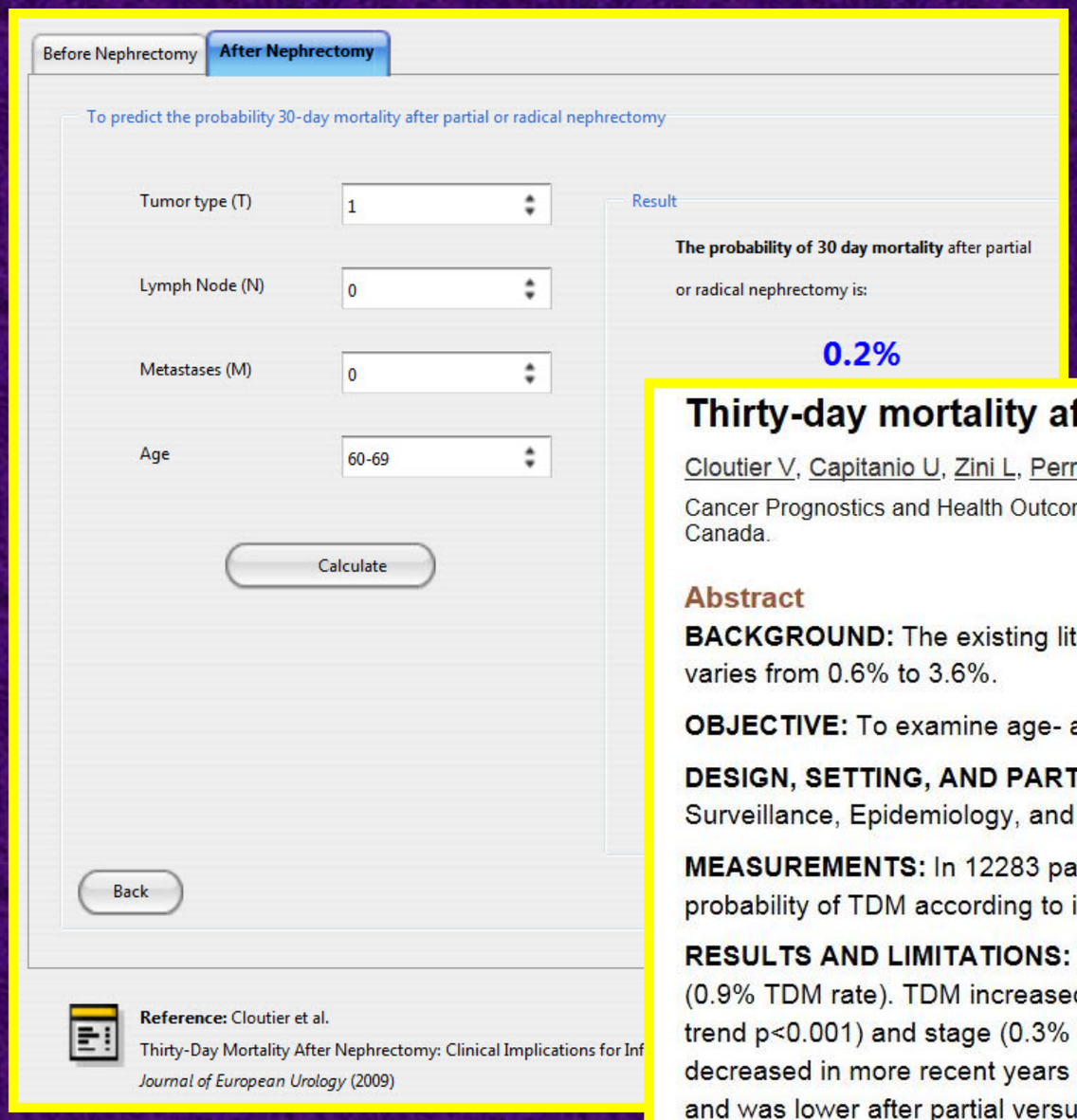
Results
We identified 30,801 cases of localized RCC (median age, 62 years; median tumor size, 4.5 cm). Five-year probabilities of kidney cancer death, other cancer death, and noncancer death were 4%, 7%, and 11%, respectively. Age was strongly predictive of mortality and most predictive of nonkidney cancer deaths ($P < .001$). Increasing tumor size was related to death from RCC and inversely related to noncancer deaths ($P < .001$). Racial differences in outcomes were most pronounced for nonkidney cancer deaths ($P < .001$). Men were more likely to die than women from all causes ($P < .002$). This nomogram integrates commonly available factors into a useful tool for comparing competing risks of death.

Conclusion
Management of localized RCC must consider competing causes of mortality, particularly in elderly populations. Effective decision making requires treatment trade-off calculations. We present a tool to quantitate competing causes of mortality in patients with localized RCC.

http://www.nomogram.org

Kutikov A, et al. J Clin Oncol. 2010;28:311-7

‘Αμεση μετεγχειρητική θνητότητα (εντός 30 ημερών)



Thirty-day mortality after nephrectomy: clinical implications for informed consent.

Cloutier V, Capitanio U, Zini L, Perrotte P, Jeldres C, Shariat SF, Arjane P, Patard JJ, Montorsi F, Karakiewicz PI.

Cancer Prognostics and Health Outcomes Unit, University of Montreal Health Centre, Department of Urology, University of Montreal, Montreal, Québec, Canada.

Abstract

BACKGROUND: The existing literature suggests that the surgical mortality (SM) observed with nephrectomy for localised disease varies from 0.6% to 3.6%.

OBJECTIVE: To examine age- and stage-specific 30-d mortality (TDM) rates after partial or radical nephrectomy.

DESIGN, SETTING, AND PARTICIPANTS: We relied on 24535 assessable patients from the National Cancer Institute (NCI) Surveillance, Epidemiology, and End Results (SEER) database.

MEASUREMENTS: In 12283 patients, logistic regression models were used to develop a tool for pretreatment prediction of the probability of TDM according to individual patient and tumour characteristics. External validation was performed on 12252 patients.

RESULTS AND LIMITATIONS: In the entire cohort of 24535 patients, 219 deaths occurred during the initial 30 d after nephrectomy (0.9% TDM rate). TDM increased with age (≤49 yr: 0.5% vs 50-59 yr: 0.7% vs 60-69 yr: 0.9% vs 70-79 yr: 1.2% vs ≥80 yr: 2.0%; $\chi(2)$ trend p<0.001) and stage (0.3% for T1-2N0M0 vs 1.3% for T3-4N0-2M0 vs 4.2% for T1-4N0-2M1; $\chi 2$ trend p=<0.001). TDM decreased in more recent years (1988-1993: 1.3% vs 1994-1998: 0.9% vs 1999-2002: 0.7% vs 2003-2004: 0.6%; $\chi 2$ trend p<0.001) and was lower after partial versus radical nephrectomy (RN) (0.4% vs 0.9%; p=0.008). Only age (p<0.001) and stage (p<0.001) achieved independent predictor status. The look-up table that relied on the regression coefficients of age and stage reached 79.4% accuracy in the external validation cohort.

CONCLUSIONS: Age and stage are the foremost determinants of TDM after nephrectomy. Our model provides individual probabilities of TDM after nephrectomy, and its use should be highly encouraged during informed consent prior to planned nephrectomy.

http://www.nomogram.org

Cloutier V, et al. Eur Urol. 2009;56:998-1003

Ειδική θνητότητα από τον καρκίνο (προσεχής 10-ετία)

A preoperative prognostic model for patients treated with nephrectomy for renal cell carcinoma.

Karakiewicz PI, Suardi N, Capitanio U, Jeldres C, Ficarra V, Cindolo L, de la Taille A, Tostain J, Mulders PF, Bensalah K, Artibani W, Salomon L, Zigeuner R, Valéri A, Descotes JL, Rambeaud JJ, Méjean A, Montorsi F, Bertini R, Patard JJ.

Cancer Prognostics and Health Outcomes Unit, University of Montreal Health Center, Montreal, QC, Canada. pierre.karakiewicz@umontreal.ca

Abstract

BACKGROUND: Currently two pretreatment prognostic models with limited accuracy (65-67%) can be used to predict survival in patients with localized renal cell carcinoma (RCC).

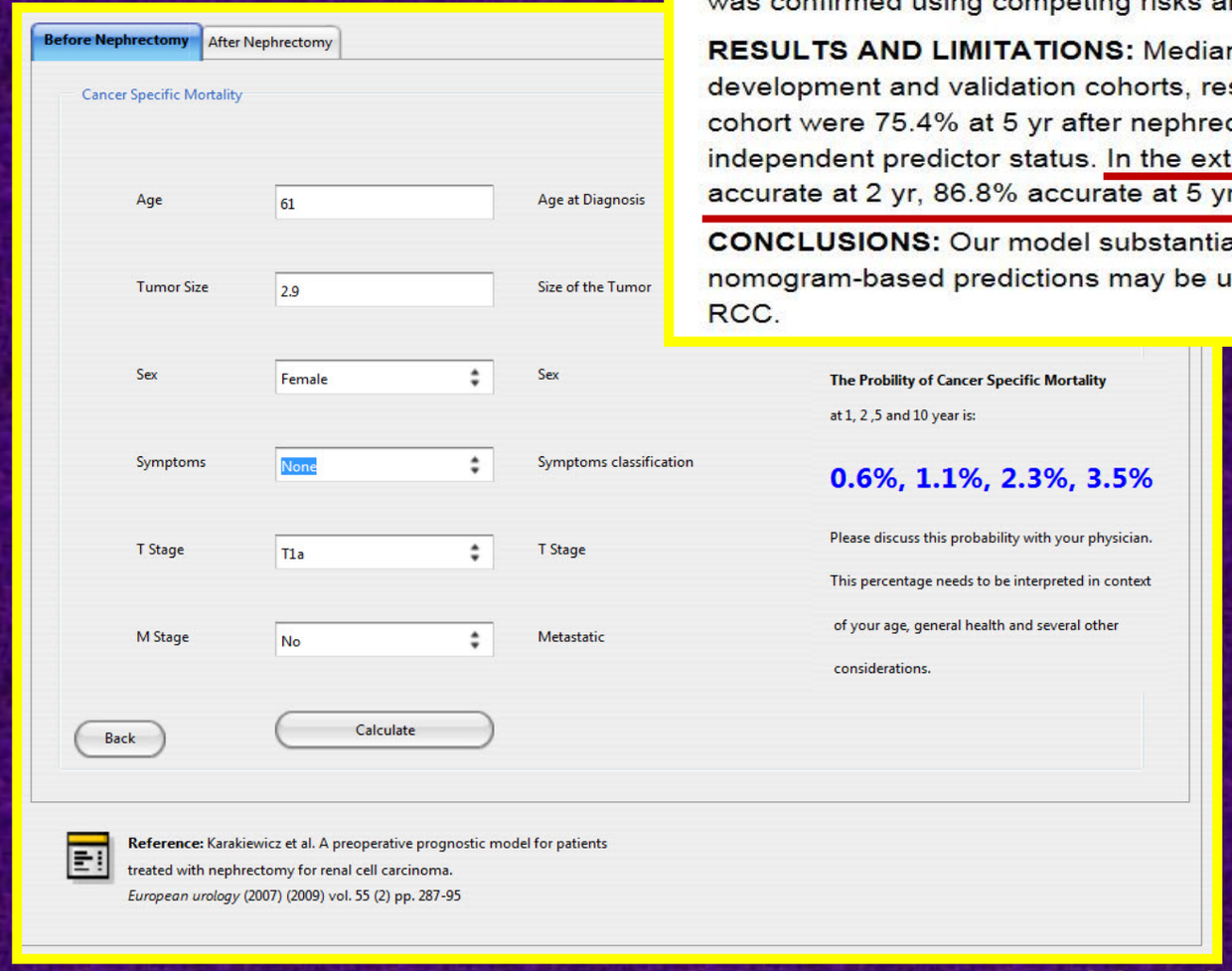
OBJECTIVE: We set out to develop a more accurate pretreatment model for predicting RCC-specific mortality after nephrectomy for all stages of RCC.

DESIGN, SETTING, AND PARTICIPANTS: The data originated from a series of prospectively recorded contemporary cases of patients treated with radical or partial nephrectomy between 1984 and 2006. Model development was performed using data from 2474 patients from five centers and external validation was performed using data from 1972 patients from seven centers.

MEASUREMENTS: The probability of RCC-specific mortality was modeled using Cox regression. The significance of the predictors was confirmed using competing risks analyses, which account for mortality from other causes.

RESULTS AND LIMITATIONS: Median follow-up in patients who did not die of RCC-specific causes was 4.2 yr and 3.5 yr in the development and validation cohorts, respectively. The freedom from cancer-specific mortality rates in the nomogram development cohort were 75.4% at 5 yr after nephrectomy and 68.3% at 10 yr after nephrectomy. All variables except gender achieved independent predictor status. In the external validation cohort the nomogram predictions were 88.1% accurate at 1 yr, 86.8% accurate at 2 yr, 86.8% accurate at 5 yr, and 84.2% accurate at 10 yr.

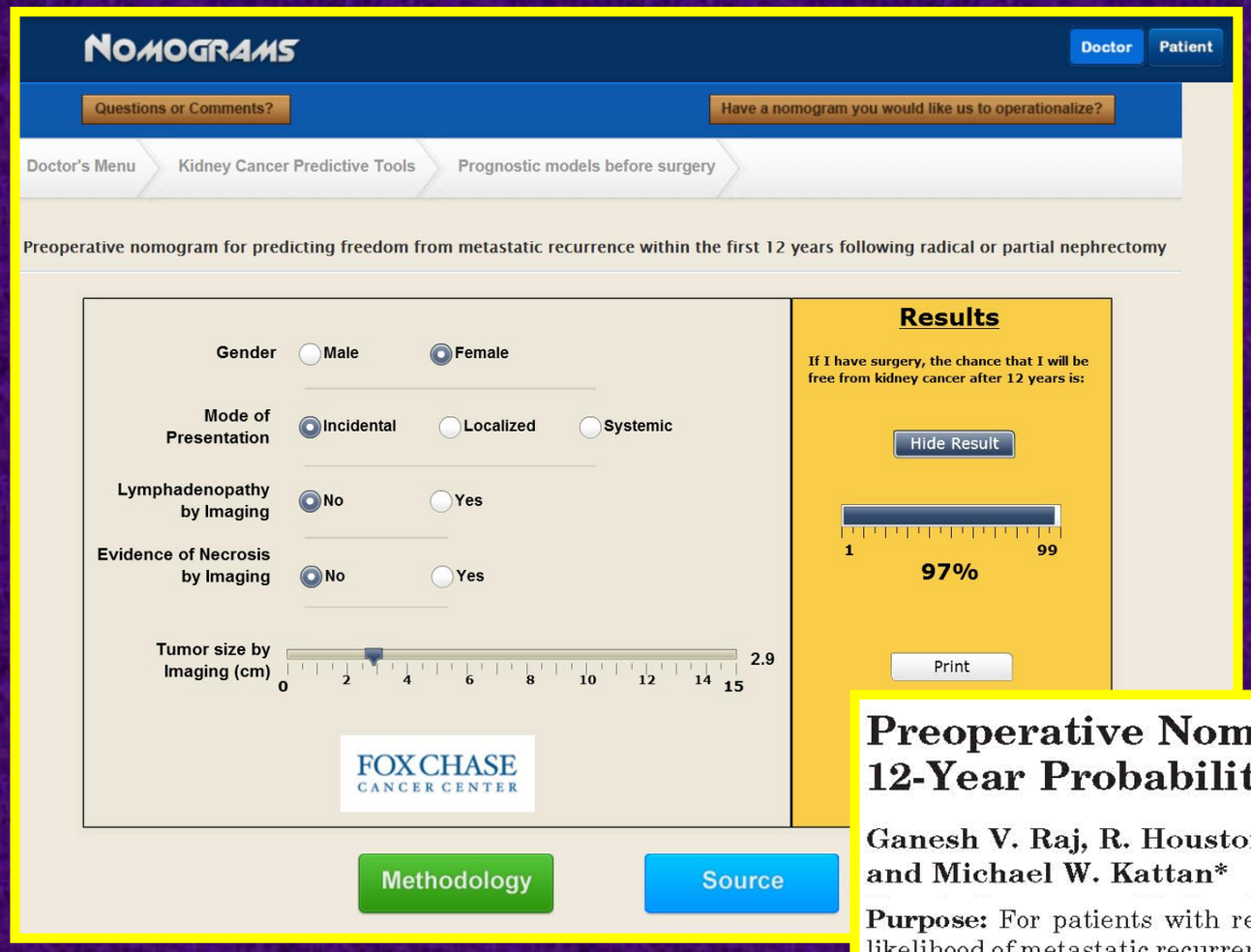
CONCLUSIONS: Our model substantially exceeds the accuracy of the existing pretreatment models. Consequently, the proposed nomogram-based predictions may be used as benchmark data for pretreatment decision making in patients with various stages of RCC.



http://www.nomogram.org

Karakiewicz PI, et al. Eur Urol. 2009;55:287-95

12-ετής επιβίωση ελεύθερη νόσου



Preoperative Nomogram Predicting 12-Year Probability of Metastatic Renal Cancer

Ganesh V. Raj, R. Houston Thompson, Bradley C. Leibovich, Michael L. Blute, Paul Russo and Michael W. Kattan*

Purpose: For patients with renal masses localized to the kidney there is currently no preoperative tool to predict the likelihood of metastatic recurrence following surgical intervention. We developed a predictive model that could be used in the preoperative setting.

Materials and Methods: We pooled institutional databases from Memorial Sloan-Kettering and Mayo Clinic, and identified complete data on 2,517 patients with renal masses and no concurrent evidence of metastases who underwent radical or partial nephrectomy. Cox proportional hazard regression analyses were used to model preoperative clinical and radiographic characteristics as predictors for development of metastases following nephrectomy. Internal validation was performed with a statistical bootstrapping technique.

Results: Metastatic recurrence developed in 340 of the 2,517 patients. Median followup for patients without metastatic recurrence was 4.7 years. A nomogram was developed using preoperative characteristics to predict the 12-year likelihood of postoperative metastatic recurrence with a concordance index of 0.80. In contrast, the concordance index of preoperative TNM staging was 0.71. Size of the primary renal mass, evidence of lymphadenopathy or necrosis on preoperative imaging and the mode of presentation were important predictors for the subsequent development of metastases.

Conclusions: We present a preoperative nomogram that accurately predicts the development of metastatic recurrence following nephrectomy. This nomogram may be potentially useful to identify and counsel patients at high risk for recurrence.

http://labs.fccc.edu/nomograms/nomogram.php?id=5&audience=1

Raj GV, et al. J Urol. 2008;179:2146-51

Κλινικό παράδειγμα 1 (συνέχεια)

- μερ. νεφρ/μή (μείωση συνολικού όγκου νεφρών ≈ 20%)
- διαυγοκυτταρικό νεφροκυτταρικό καρκίνωμα
- μέγιστη διάμετρος όγκου 2,9 cm
- Fuhrman grade 3
- στοιχεία νέκρωσης κατά τόπους
- στοιχεία αγγειακής διήθησης

✓ Μετεγχειρητικά νομογράμματα (μερική/ριζική νεφρ/μη)

- διατήρηση φυσιολογικής νεφρικής λειτουργίας (7-ετία)
- 5-ετής επιβίωση ελεύθερη υποτροπής
- ειδική θνητότητα από τον καρκίνο (10-ετία)
- δεσμευμένη πιθανότητα επιβίωσης (10-ετία)
- ειδική καρκινική θνητότητα - προσδόκιμο (15-ετία)
- παρακολούθηση ασθενούς
- επιβίωση μετά από υποτροπή (1-5 έτη)
- αναχαίτιση εξέλιξης από σουνιτινίμπη (12-μηνη)

Διατήρηση φυσιολογικής νεφρικής λειτουργίας (7-ετία)
5-ετής επιβίωση ελεύθερη υποτροπής

Cleveland Clinic QHS
RISK CALCULATOR

Renal Cell Carcinoma
Outcomes using Post-Op information

Symptoms/Presentation	Incidental
Histology	Conventional
Tumor size	2.9
1997 P Stage	Unknown
Age	61
Gender	☑
ASA score	0,1
Pre-operative Creatinine	1
Percent Change in Kidney Volume	20
2002pT	T1A
Grade	3
Necrosis	Yes
Vasc.Inv	Yes

Save Inputs | Recall Inputs | Clear Cache

Calculate

5-year Recurrence Free Survival[1]

93%

7-year Freedom from Renal Insufficiency after partial or radical nephrectomy[2]

99%

5-year Freedom from Recurrence after partial or radical nephrectomy[3]

92%

[1] Kattan MW, Reuter V, Motzer RJ, Katz J, Russo P. A postoperative prognostic nomogram for renal cell carcinoma. J Urol 2001;166(1):63-67.
[2] Sorbellini M, Kattan MW, Snyder ME, Hakimi AA, Sarasohn DM, Russo P. Prognostic nomogram for renal insufficiency after radical or partial nephrectomy. J. Urol. 2006 Aug;176(2):472-476.
[3] Sorbellini M, Kattan MW, Snyder ME, Goetzl M, McKiernan J, Russo P:A post operative nomogram predicting recurrence for patients with conventional clear-cell renal cell carcinoma. J Urol. 2005 Jan;173(1):48-51.

http://rcc.simpal.com/RCEval.cgi?RCID=arrigas%40ccf.org_kidney%20post%20combo.txt

Διατήρηση φυσιολογικής νεφρικής λειτουργίας (7-ετία)

Prognostic Nomogram for Renal Insufficiency After Radical or Partial Nephrectomy

Maximiliano Sorbellini, Michael W. Kattan, Mark E. Snyder, A. Ari Hakimi, Debra M. Sarasohn and Paul Russo*

From the Departments of Urology (MS, MES, AAH, PR) and Radiology (DMS), Memorial Sloan-Kettering Cancer Center, New York, New York, and Department of Quantitative Health Sciences, Cleveland Clinic Foundation (MWK), Cleveland, Ohio

Purpose: We analyzed prognostic factors to predict renal insufficiency after partial or radical nephrectomy. We developed and performed internal validations of a postoperative nomogram for this purpose. We used a prospectively updated renal tumor database of more than 1,500 patients.

Materials and Methods: From July 1989 to October 2003, 161 partial nephrectomies and 857 radical nephrectomies performed at Memorial Sloan-Kettering Cancer Center for renal cortical tumors were analyzed. Computerized tomography images were reviewed by a single radiologist. Kidney volume was calculated using the ellipsoid formula, $V = L1 \times L2 \times L3 \times \pi/6$, where V represents volume and L represents length. Renal insufficiency was defined by 2 serum creatinine values greater than 2.0 mg/dl at least 1 month postoperatively. Tumor histology was not an exclusion criterion and yet we excluded cases of bilateral synchronous disease. Prognostic variables were preoperative serum creatinine, American Society of Anesthesiologists score, percent change in kidney volume after surgery, and patient age and sex.

Results: Renal insufficiency was noted in 105 of the 857 patients with radical nephrectomy (12.3%) and in 6 of the 161 with partial nephrectomy (3.7%) studied. Patients had a median followup of 21.2 months (maximum 157.9). The 7-year probability of freedom from renal insufficiency in the cohort was 79.1% (95% CI 74.6 to 83.6). The nomogram was designed based on a Cox proportional hazards regression model. Following internal statistical validation nomogram predictions appeared accurate and discriminating with a concordance index of 0.835.

Conclusions: A nomogram was developed that can predict the 7-year probability of renal insufficiency in patients undergoing radical or partial nephrectomy.

Sorbellini M, et al.. J Urol. 2006;176:472-6

5-ετής επιβίωση ελεύθερη υποτροπής

A POSTOPERATIVE PROGNOSTIC NOMOGRAM FOR RENAL CELL CARCINOMA

MICHAEL W. KATTAN,* VICTOR REUTER, ROBERT J. MOTZER, JARED KATZ AND PAUL RUSSO

From the Departments of Urology, Epidemiology and Biostatistics, Pathology, and Medicine (Genitourinary Oncology Service), Memorial Sloan-Kettering Cancer Center, New York, New York

ABSTRACT

Purpose: Few published studies have combined prognostic factors to predict the likelihood of recurrence after surgery for renal cell carcinoma. We developed a nomogram for this purpose.

Materials and Methods: With Cox proportional hazards regression analysis, we modeled pathological data and disease followup for 601 patients with renal cell carcinoma who were treated with nephrectomy. Predictor variables were patient symptoms, including incidental, local or systemic, histology, including chromophobe, papillary or conventional, tumor size, and pathological stage. Treatment failure was recorded when there was either clinical evidence of disease recurrence or death from disease. Validation was performed with a statistical (bootstrapping) technique.

Results: Disease recurrence was noted in 66 of the 601 patients, and those in whom treatment was successful had a median and maximum followup of 40 and 123 months, respectively. The 5-year probability of freedom from failure for the patient cohort was 86% (95% confidence interval 82 to 89). With statistical validation, predictions by the nomogram appeared accurate and discriminating with an area under the receiver operating characteristic curve, that is a comparison of the predicted probability with the actual outcome of 0.74.

Conclusions: A nomogram has been developed that can be used to predict the 5-year probability of treatment failure among patients with newly diagnosed renal cell carcinoma. The nomogram may be useful for patient counseling, clinical trial design and patient followup planning.

Kattan MW, et al. J Urol. 2001;166:63-7

5-ετής επιβίωση ελεύθερη υποτροπής

A POSTOPERATIVE PROGNOSTIC NOMOGRAM PREDICTING RECURRENCE FOR PATIENTS WITH CONVENTIONAL CLEAR CELL RENAL CELL CARCINOMA

MAXIMILIANO SORBELLINI, MICHAEL W. KATTAN, MARK E. SNYDER, VICTOR REUTER, ROBERT MOTZER, MANLIO GOETZL, JAMES McKIERNAN AND PAUL RUSSO

From the Departments of Urology (MS, MWK, MES, RM, PR), Pathology (VR), and Epidemiology and Biostatistics (MWK), Memorial Sloan-Kettering Cancer Center, and the Department of Urology, Columbia University (MG, JM), New York, New York

ABSTRACT

Purpose: Few published studies have simultaneously analyzed multiple prognostic factors to predict recurrence after surgery for conventional clear cell renal cortical carcinomas. We developed and performed external validation of a postoperative nomogram for this purpose. We used a prospectively updated database of more than 1,400 patients treated at a single institution.

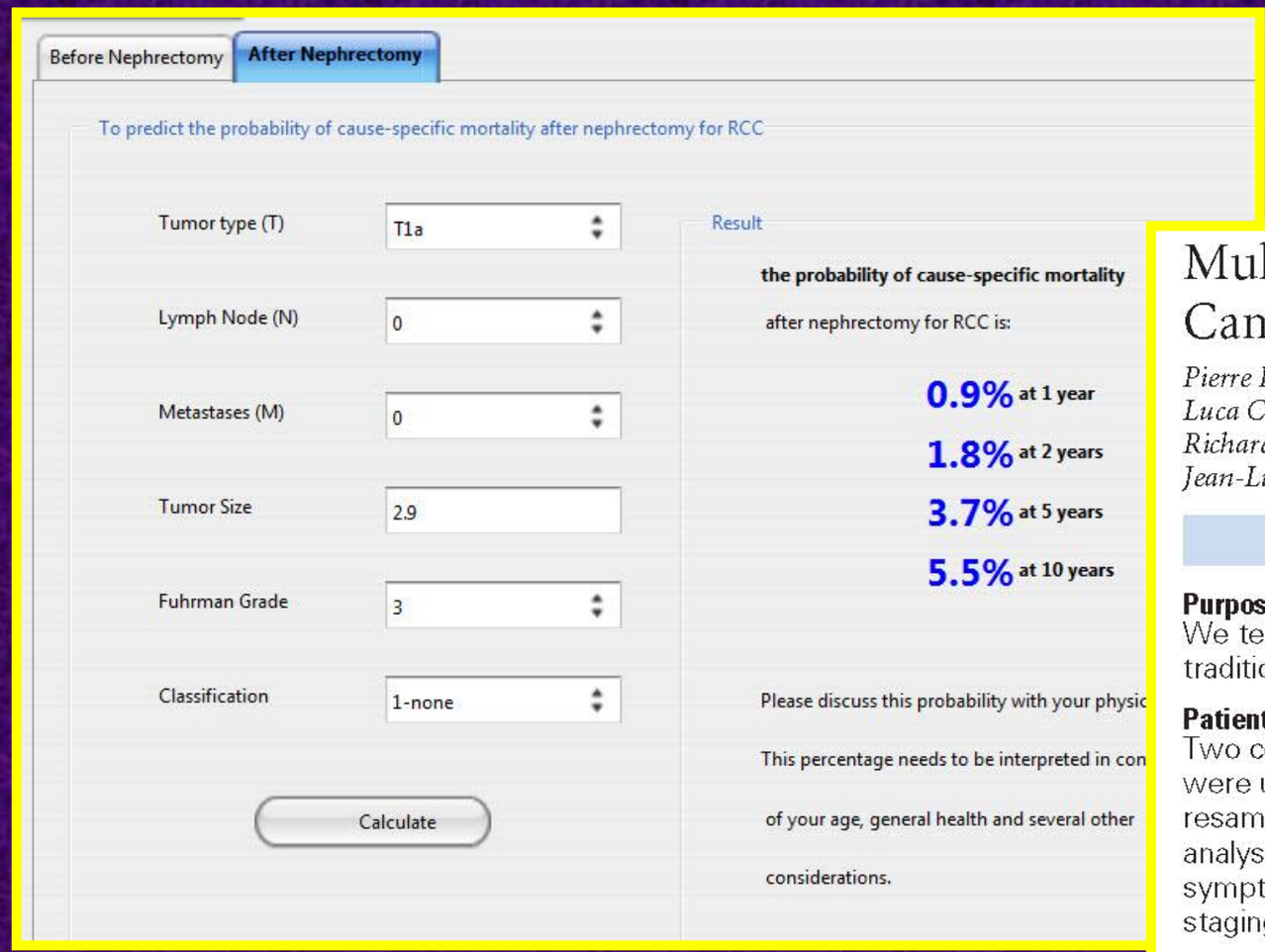
Materials and Methods: From January 1989 to August 2002, 833 nephrectomies (partial and radical) for renal cell carcinoma of conventional clear cell histology performed at Memorial Sloan-Kettering Cancer Center were reviewed from the center's kidney database. Patients with von Hippel-Lindau disease or familial syndromes, as well as patients presenting with synchronous bilateral renal masses, or distant metastases or metastatic regional lymph nodes before or at surgery were excluded from study. We modeled clinicopathological data and disease followup for 701 patients with conventional clear cell renal cell carcinoma. Prognostic variables for the nomogram included pathological stage, Fuhrman grade, tumor size, necrosis, vascular invasion and clinical presentation (ie incidental asymptomatic, locally symptomatic or systemically symptomatic).

Results: Disease recurrence was noted in 72 of 701 patients. Those patients without evidence of disease had a median and maximum followup of 32 and 120 months, respectively. The 5-year probability of freedom from recurrence for the patient cohort was 80.9% (95% confidence interval 75.7% to 85.1%). A nomogram was designed based on a Cox proportional hazards regression model. Following external validation predictions by the nomogram appeared accurate and discriminating, and the concordance index was 0.82.

Conclusions: A nomogram has been developed that can be used to predict the 5-year probability of freedom from recurrence for patients with conventional clear cell renal cell carcinoma. This nomogram may be useful for patient counseling, clinical trial design and effective patient followup strategies.

Sorbellini M, et al. J Urol. 2005;173:48-51

Ειδική θνητότητα από τον καρκίνο (10-ετία)



Multi-Institutional Validation of a New Renal Cancer–Specific Survival Nomogram

Pierre I. Karakiewicz, Alberto Briganti, Felix K.-H. Chun, Quoc-Dien Trinh, Paul Perrotte, Vincenzo Ficarra, Luca Cindolo, Alexandre De La Taille, Jacques Tostain, Peter F.A. Mulders, Laurent Salomon, Richard Zigeuner, Tommaso Prayer-Galetti, Denis Chautard, Antoine Valeri, Eric Lechevallier, Jean-Luc Descotes, Herve Lang, Arnaud Mejean, and Jean-Jacques Patard

A B S T R A C T

Purpose
We tested the hypothesis that the prediction of renal cancer–specific survival can be improved if traditional predictor variables are used within a prognostic nomogram.

Patients and Methods
Two cohorts of patients treated with either radical or partial nephrectomy for renal cortical tumors were used: one (n = 2,530) for nomogram development and for internal validation (200 bootstrap resamples), and a second (n = 1,422) for external validation. Cox proportional hazards regression analyses modeled the 2002 TNM stages, tumor size, Fuhrman grade, histologic subtype, local symptoms, age, and sex. The accuracy of the nomogram was compared with an established staging scheme.

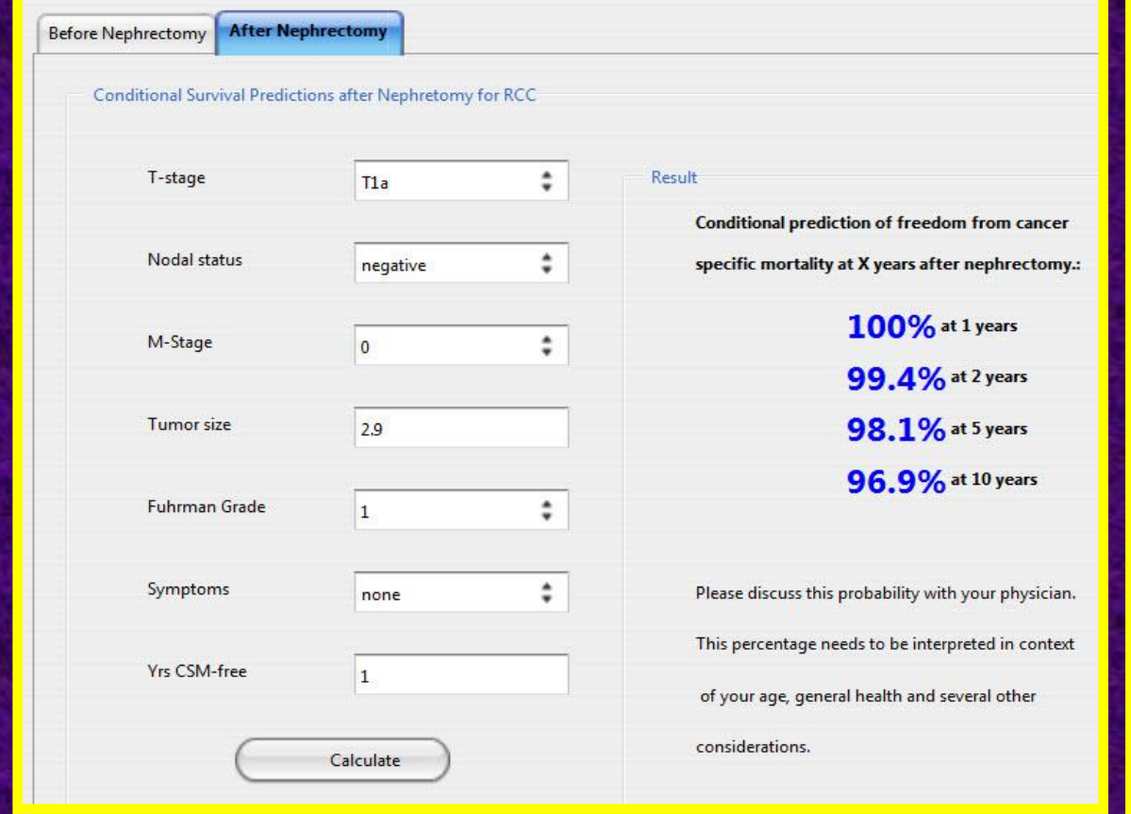
Results
Cancer-specific mortality was observed in 598 (23.6%) patients, whereas 200 (7.9%) died as a result of other causes. Follow-up ranged from 0.1 to 286 months (median, 38.8 months). External validation of the nomogram at 1, 2, 5, and 10 years after nephrectomy revealed predictive accuracy of 87.8%, 89.2%, 86.7%, and 88.8%, respectively. Conversely, the alternative staging scheme predicting at 2 and 5 years was less accurate, as evidenced by 86.1% ($P = .006$) and 83.9% ($P = .02$) estimates.

Conclusion
The new nomogram is more contemporary, provides predictions that reach further in time and, compared with its alternative, which predicts at 2 and 5 years, generates 3.1% and 2.8% more accurate predictions, respectively.

http://www.nomogram.org

Karakiewicz PI, et al. J Clin Oncol. 2007;25:1316-22

Δεσμευμένη επιβίωση 12 μήνες μετά (10-ετία)



Conditional Survival Predictions After Nephrectomy for Renal Cell Carcinoma

Pierre I. Karakiewicz,*,† Nazareno Suardi,* Umberto Capitanio,* Hendrik Isbarn, Claudio Jeldres,* Paul Perrotte,* Maxine Sun,* Vincenzo Ficarra,* Richard Zigeuner,* Jacques Tostain,* Arnaud Mejean,* Luca Cindolo,* Allan J. Pantuck,‡ Arie S. Belldegrun,* Laurent Zini,* Alexandre de la Taille,* Denis Chautard,* Jean-Luc Descotes,* Shahrokh F. Shariat,* Antoine Valeri,* Peter F. A. Mulders,* Hervé Lang,* Eric Lechevallier* and Jean-Jacques Patard*

Purpose: Conditional survival implies that on average long-term cancer survivors have a better prognosis than do newly diagnosed individuals. We explored the effect of conditional survival in renal cell carcinoma.

Materials and Methods: We studied 3,560 patients with renal cell carcinoma of all stages treated with nephrectomy. We applied conditional survival methodology to a previously reported posttreatment nomogram predicting survival after nephrectomy for patients with renal cell carcinoma stage I to IV. We used the same predictor variables that were integrated in the original multivariable Cox regression models, namely TNM stage, Fuhrman grade, tumor size and symptom classification. To validate the conditional survival nomogram we used an independent cohort of 3,560 patients from 15 institutions.

Results: The 5-year survival of patients immediately after nephrectomy was 74.2%, which increased to 80.4%, 85.1%, 90.6% and 89.6% at 1, 2, 5 and 10 years after nephrectomy, respectively. The predicted probabilities varied by as much as 50% when, for example, predictions of renal cell carcinoma specific mortality at 10 years were made after nephrectomy 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.

Conclusions: We developed (2,530) and externally validated (3,560) a conditional nomogram for predicting renal cell carcinoma specific mortality that allows consideration of the length of survivorship. Our tool provides the most realistic prognosis estimates with high accuracy.

http://www.nomogram.org

Karakiewicz PI, et al. J Urol. 2009;182:2607-12

Ειδική καρκινική θνητότητα - προσδόκιμο (15-ετία)

CancerMath.net

Renal Cell Carcinoma Outcome Calculator

CancerMath | Renal Cancer Tools | All Cancers | About

Enter patient information:

Patient characteristics

Current Age: 61

Sex: Female

Race: White

Years since diagnosis: 0

Tumor characteristics

Tumor Diameter: 2.9 (cm)

Local lymph nodes: No Positive nodes

Histological Type: Clear cell

Grade: 3 - Poorly diff.

Tumor Extension: kidney cortex

Update Graph

Questions or trouble? Click here for the calculator FAQ

Display as: Mortality curves

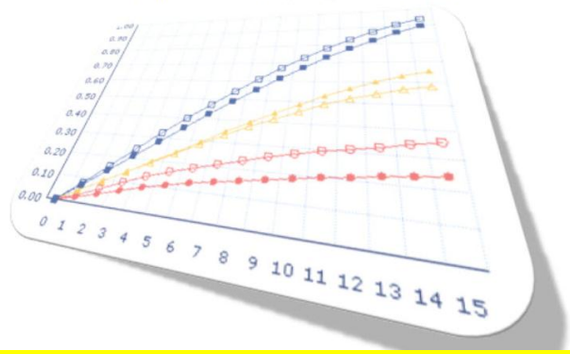
Classification:	**T1a N0 Mx AJCC Stage: I**
Cancer Mortality:	**12.6%** 15-year cancer mortality. (Kaplan-Meier death rate of **14.2%**)
Life Expectancy:	**18.9** years median survival **19.5** years mean survival A 61-year-old woman without this cancer would have mean survival of **23.1** years.

LABORATORY FOR QUANTITATIVE MEDICINE
MASSACHUSETTS GENERAL HOSPITAL

HOME | PEOPLE | RESEARCH | PUBLICATIONS | LINKS | CONTACT

Home

Welcome to the Laboratory for Quantitative Medicine



www.lifemath.net/cancer/renalcell/outcome/index.php

National Cancer Institute: Surveillance Epidemiology and End Results Database

Παρακολούθηση

NOMOGRAMS

Doctor | Patient

Questions or Comments? | Have a nomogram you would like us to operationalize?

Doctor's Menu > NCCN Guidelines > Kidney

NCCN Surveillance Guidelines for Kidney Cancer

NCCN Clinical Practice Guidelines in Oncology: Kidney Cancer v 1.2011

Initial Evaluation | NCCN/AUA Guidelines | Recommended Followup | Staging/Prognosis

Surveillance plan calculator

Follow-up for patients with completely resected disease includes an abdominal and chest CT scan obtained approximately 4 to 6 months after surgery to serve as a baseline. No single follow-up plan is appropriate for all patients therefore individual follow-up plan should be developed depending on the size of the primary tumor, the extent of extrarenal spread, histology, and relative risk of relapse. Patients are seen every 6 months for the first 2 years after surgery and annually thereafter and each visit should include a history, physical examination, and comprehensive metabolic panel (e.g., blood urea nitrogen, serum creatinine, calcium levels, LDH, liver function tests).

As an alternate protocol, the NCCN Kidney Cancer panel members suggest the surveillance protocol based on

T Stage	N Stage	Grade	ECOG-PS
(•) T1	(•) N0	( ) I	(•) ECOG 0
( ) T2	( ) N1	( ) II	( ) ECOG 1
( ) T3		(•) III	( ) ECOG 2
( ) T4		( ) IV	( ) ECOG 3

T Stage | N Stage | Grade | ECOG

T1: Tumor 7 cm or less in greatest dimension, limited to the kidney

T1a: Tumor 4 cm or less in greatest dimension, limited to the kidney

T1b: Tumor more than 4 cm but not more than 7 cm in greatest dimension, limited to the kidney

T2: Tumor more than 7 cm in greatest

Intermediate Risk

Followup/Months	3	6	12	18	24	30	36	48	60	84	108
History and Physical Examination		X	X	X	X	X	X	X	X	X	X
Laboratory studies		X	X	X	X	X	X	X	X	X	X
Chest CT		X	X	X	X	X	X	X	X	X	X
Abdominal CT			X				X		X	X	X

http://labs.fccc.edu/nomograms/nomogram.php?id=45&audience=1&status=1

Κλινικό παράδειγμα 1 (συνέχεια)

- 14 μήνες μετά, μετάσταση πνεύμονα (1 εστία)
- Hgb = 12.3 g/dl (φ.τ.: 12 - 16 g/dl)
- PLT = 300.000 (φ.τ.: 150.000 - 400.000)
- LDH = 426 U/L (φ.τ.: 135 - 225 U/L)
- ALP = 79 U/L (φ.τ.: 35 - 104 U/L)
- Ca (διορθωμένο) = 10,4 mg/dl (φ.τ.: 8,4 - 10,0 mg/dl)

Επιβίωση μετά από υποτροπή (1-5 έτη)

Renal Cell Carcinoma Recurrence After Nephrectomy for Localized Disease: Predicting Survival From Time of Recurrence

Scott E. Eggener, Ofer Yossepowitch, Joseph A. Pettus, Mark E. Snyder, Robert J. Motzer, and Paul Russo

A B S T R A C T

Purpose
Prognostic factors for patients with metastatic renal cell carcinoma (RCC) are well established. However, the risk profile is unknown for patients with recurrent RCC after a nephrectomy for localized disease.

Patients and Methods
From January 1989 to July 2005, we identified patients with localized RCC treated by nephrectomy who subsequently developed recurrent disease. We applied a validated prognostic scoring system previously developed for patients with metastatic RCC. Each patient was given a total risk score of 0 to 5, with one point for each of five prognostic variables (recurrence < 12 months after nephrectomy, serum calcium > 10 mg/dL, hemoglobin < lower limit of normal, lactate dehydrogenase > 1.5× upper limit of normal, and Karnofsky performance status < 80%). Patients were categorized into low- (score = 0), intermediate- (score = 1 to 2), and high-risk subgroups (score = 3 to 5).

Results
Our final cohort included 118 patients, with a median survival time of 21 months from the time of recurrence. Median follow-up time for survivors was 27 months. Overall survival was strongly associated with risk group category ($P < .0001$). Low-risk, intermediate-risk, and high-risk criteria were fulfilled in 34%, 50%, and 16% of patients, respectively. Median survival time for low-risk, intermediate-risk, and high-risk patients was 76, 25, and 6 months, respectively. Two-year overall survival rates for low-risk, intermediate-risk, and high-risk patients were 88% (95% CI, 77% to 99%), 51% (95% CI, 37% to 65%), and 11% (95% CI, 0% to 24%), respectively.

Conclusion
At disease recurrence after nephrectomy for localized disease, a scoring system based on objective clinical and laboratory data provides meaningful risk stratification for both patient counseling and clinical trial entry.

Eggener SE, et al.. J Clin Oncol. 2006;24:3101-6

Επιβίωση μετά από υποτροπή (1-5 έτη)

NOMOGRAMS

Doctor | Patient

Questions or Comments?

Have a nomogram you would like us to operationalize?

Doctor's Menu > Kidney Cancer Predictive Tools > Prognostic models - recurrent / advanced / metastatic disease

Predictive model for survival in patients who have experienced a recurrence following nephrectomy

High Lactate Dehydrogenase? (> 1.5 times upper limit of normal)	○ No	● Yes
Low Serum Hemoglobin? (< lower limit of normal)	● No	○ Yes
High Corrected Serum Calcium? (> 10 mg/dL)	○ No	● Yes
Low Karnofsky Performance Status? (< 80%)	● No	○ Yes
Recurrence Less Than 12 Months after Nephrectomy?	● No	○ Yes

Please Note: Karnofsky performance status is a scale that allows a physician to rate the patient's ability to perform activities of daily living. Patients who are unable to work or perform normal activity due to their illness are assigned a Karnofsky performance status of less than 80%

FOX CHASE CANCER CENTER

Results

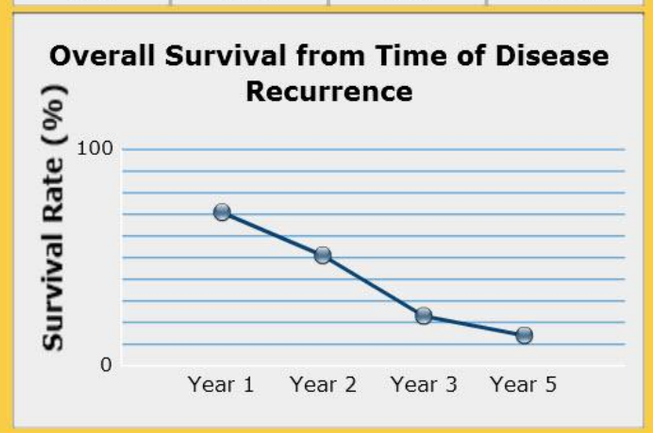
My expected survival if i have experienced a recurrence following nephrectomy is:

Hide Result | Print

Risk

My 5 year survival expectation is:

Year 1	Year 2	Year 3	Year 5
71%	51%	23%	14%



http://labs.fccc.edu/nomograms/nomogram.php?id=12&audience=1

Eggener SE, et al.. J Clin Oncol. 2006;24:3101-6

Αναχαίτιση της εξέλιξης από σουνιτινίμπη (12-μηνη)

Prognostic Nomogram for Sunitinib in Patients With Metastatic RCC

BACKGROUND. In a randomized, phase 3 trial, sunitinib demonstrated superior efficacy over interferon-alfa as first-line therapy in patients with metastatic clear-cell renal cell carcinoma (RCC). On the basis of outcome data from that trial, the authors developed a nomogram for predicting the probability of 12-month progression-free survival for patients who received sunitinib therapy.

METHODS. Three-hundred seventy-five patients who received sunitinib in the phase 3 trial were the subject of the current analysis. Nomogram pretreatment predictor variables included corrected serum calcium levels, the number of metastatic sites, hemoglobin levels, prior nephrectomy, the presence of lung and liver metastases, thrombocytosis, Eastern Cooperative Oncology Group performance status, time from diagnosis to treatment, and serum levels of alkaline phosphatase and lactate dehydrogenase. Investigator-assessed progression-free survival was the predicted outcome endpoint. Internal validation of the nomogram consisted of quantification of the discrimination with the concordance index and assessment of calibration.

RESULTS. One-hundred seventy-four of 375 patients (46%) who received sunitinib achieved an objective response, and the median progression-free survival was 10.8 months (95% confidence interval, 10.6-12.6 months). A nomogram for predicting the probability of 12-month progression-free survival for patients who received sunitinib therapy was constructed on the basis of a Cox regression model from 11 parameters that were determined before treatment. The concordance index was 0.633.

CONCLUSIONS. A nomogram was developed from pretreatment clinical features to predict the probability of achieving 12-month progression-free survival with sunitinib therapy for metastatic clear-cell RCC. The authors concluded that independent validation of the nomogram and additional studies to identify tumor-specific prognostic factors are warranted. ***Cancer* 2008;113:1552-8.** © *2008 American Cancer Society.*

Motzer RJ, et al. Cancer. 2008;113:1552-8

Αναχαίτιση της εξέλιξης από σουνιτινίμπη (12-μηνη)

NOMOGRAMS

Doctor | Patient

Questions or Comments? | Have a nomogram you would like us to operationalize?

Doctor's Menu > Kidney Cancer Predictive Tools > Prognostic models - recurrent / advanced / metastatic disease

Nomogram predicting 12-month progression-free survival in patients with metastatic Clear Cell RCC who receive sunitinib

Number of Metastatic Sites: (•) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7

Lung Metastases? ( ) No (•) Yes

Liver Metastases? (•) No ( ) Yes

ECOG PS*? (•) 0 ( ) 1

Thrombocytosis? (•) No ( ) Yes

Prior Nephrectomy? ( ) No (•) Yes

Hemoglobin* (•) >= Lower Limit of Normal ( ) < Lower Limit of Normal

Time between Diagnosis and Treatment, in Months: 14 (0 – 300)

Alk Phos / (ULN of Alk Phos) *: 0.76 (0 – 5)

LDH / (ULN of LDH) *: 1.89 (0 – 4)

Corrected Calcium, mg/dL *: 10.4 (7 – 13)

* Eastern Cooperative Oncology Group Performance Status

* Corrected calcium = total calcium (mg/dL) - 0.707 * (serum albumin[g/dL] - 3.4) (see Orrell, 1971 - 24).

* ULN: Upper Limit of Normal

* Alk Phos: alkaline phosphatase

* LDH: lactate dehydrogenase

* Thrombocytosis is defined herein as a platelet count > 400,000/lL

FOX CHASE CANCER CENTER

Results

The likelihood of sunitinib stopping progression of my clear cell renal cell carcinoma for the next 12 months is:

Hide Results

0 – 83

40.5%

Print

http://labs.fccc.edu/nomograms/nomogram.php?id=14&audience=1

Motzer RJ, et al. Cancer. 2008;113:1552-8

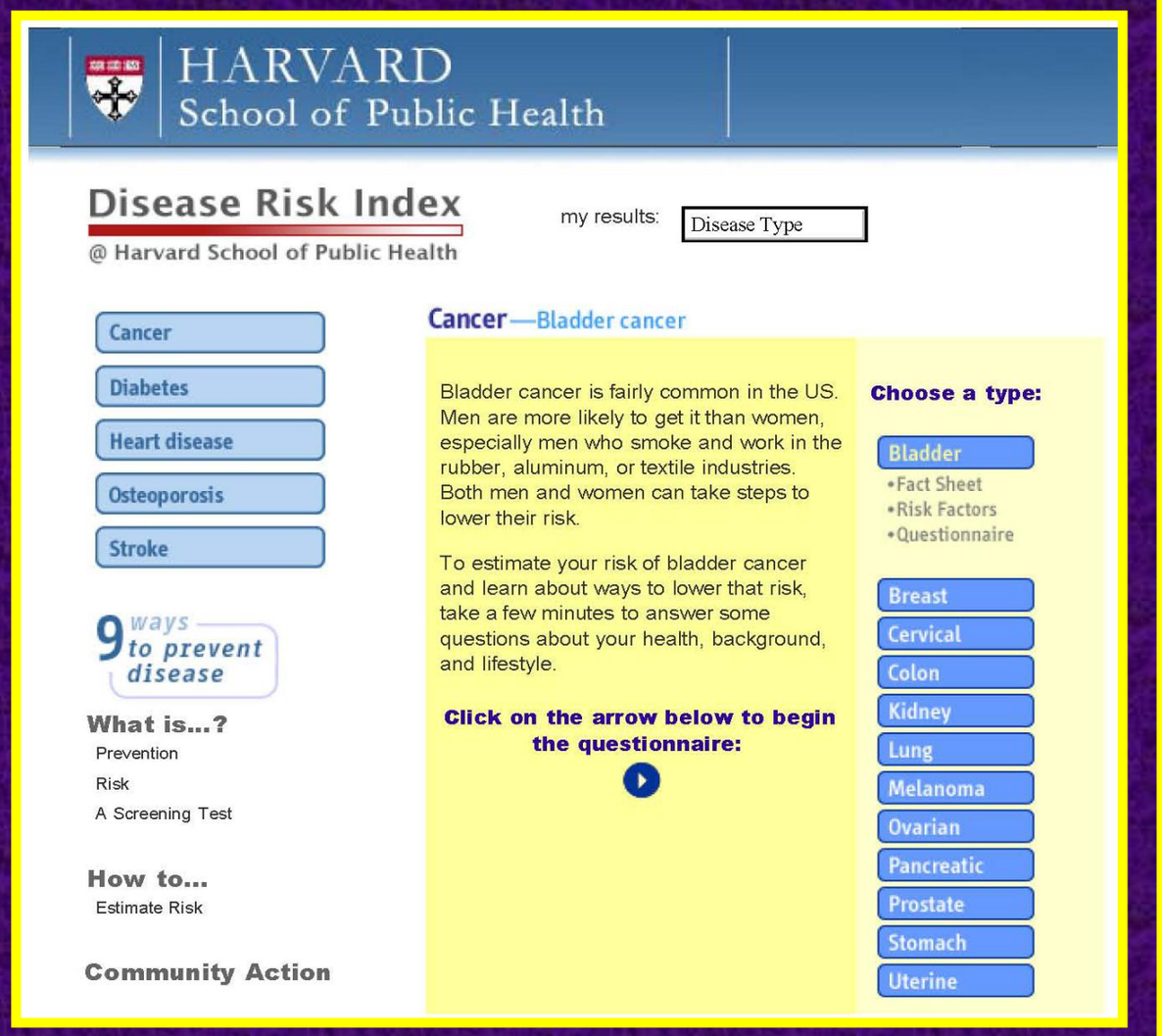
ΚΑΡΚΙΝΟΣ ΟΥΡΟΔΟΧΟΥ ΚΥΣΤΗΣ

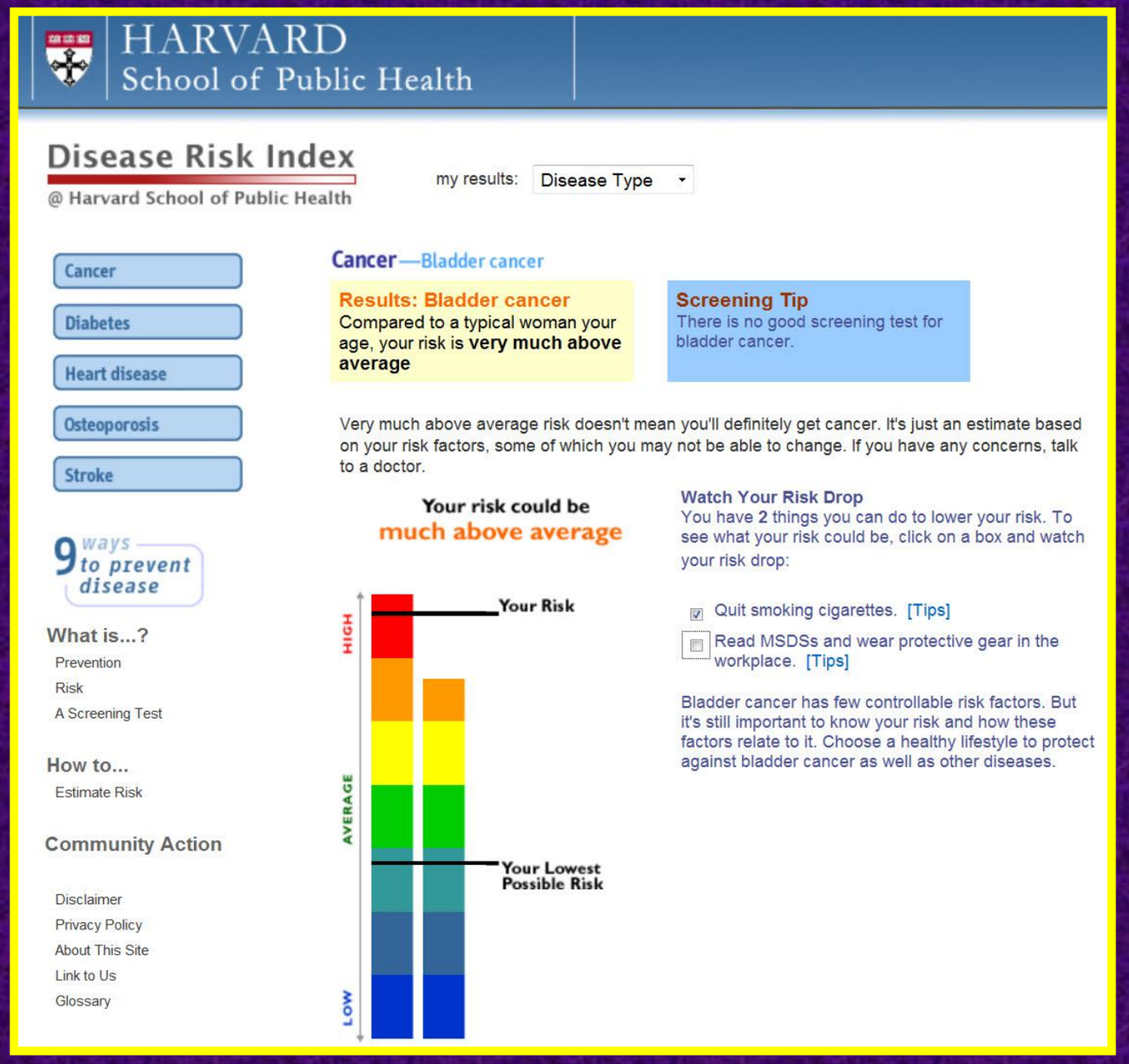
5ο Διαδραστικό Σχολείο Ουρολογίας, 26-29 Απριλίου 2012, Χ. Μαμουλάκης: c.mamoulakis@med.uoc.gr

Κλινικό παράδειγμα 2

- άνδρας, 68 ετών
- (-) ατομικό αναμνηστικό για καρκίνο
- (-) οικογενειακό ιστορικό α΄-β΄ βαθμού για καρκίνο κύστης
- καπνιστής (≈ 20 τσιγάρα ημερησίως)
- συνταξιούχος ελαιοχρωματιστής (> 30 έτη)
- δε συνήθιζε να φορά στολή προστασίας στη δουλειά του
- χρήση πόσιμου νερού από ιδιωτικό πηγάδι στο χωρίο του
- δεν αναφέρει αιματουρία, NMP22 (-)

✓ Εκτίμηση κινδύνου και πρόληψη (γενικός πληθυσμός)





http://www.diseaseriskindex.harvard.edu/update/hccpquiz.pl?lang=english&func=home&quiz

Harvard Report on Cancer Prevention, Volume 4: Harvard Cancer Risk Index

Πιθανότητα καρκίνου κύστης σε άτομα υψηλού κινδύνου

BCa Diagnosis in high risk individuals

Age 68

Gender Male

Smoker Yes

Race White

Hematuria None

NMP 22 Negative

Back Calculate

Result

The risk of having

BCa is:

1.9%

Reference: Lotan et al. Impact of clinical factors, including a point-of-care nuclear matrix protein-22 assay and cytology, on bladder cancer detection. *BJU international* (2009) vol. 103 (10) pp. 1368-74

BJUI BJU INTERNATIONAL

Impact of clinical factors, including a point-of-care nuclear matrix protein-22 assay and cytology, on bladder cancer detection

Yair Lotan, Umberto Capitanio*†, Shahrokh F. Shariat, Georg C. Hutterer*† and Pierre I. Karakiewicz*

Study Type – Diagnostic (exploratory cohort)
Level of Evidence 2b

OBJECTIVE

To determine whether the nuclear matrix protein-22 (NMP22) assay can improve the accuracy of discriminating between high-risk patients with and without bladder cancer.

PATIENTS AND METHODS

Age, gender, race, smoking status, haematuria and its extent, and the NMP22 and urinary cytology results, were available for 1272 patients. The data of 670 (52.7%) from four study sites were used to develop a logistic regression model-based nomogram to predict the presence of bladder cancer. The remaining data from 602 (47.3%) patients from nine study sites were used to externally validate the nomogram. A separate nomogram was developed for urinary cytology, and for the combination of NMP22 and urinary cytology findings.

RESULTS

Of 1272 patients, 76 (6.0%) had bladder cancer, 217 (17.1%) were NMP22-positive and 17 (1.3%) had malignant cells on urinary cytology. NMP22 and urinary cytology results were independent predictors of bladder cancer ($P = 0.005$ and 0.007, respectively). In external validation, the area under the curve (AUC) for NMP22 was 76.0% vs 56.2% for cytology. External validation of the multivariable NMP22-based bladder cancer nomogram gave an AUC of 82.4% vs 74.7% for the multivariable cytology-based nomogram (gain 7.7%; $P = 0.006$) vs 82.6% for the multivariable nomogram combining NMP22 and cytology results (gain 0.2%; $P = 0.1$).

CONCLUSIONS

The ability of the NMP22 test to predict bladder cancer in high-risk patients significantly exceeds that of urinary cytology. The NMP22-based nomogram can help to identify individuals at risk of bladder cancer.

KEYWORDS

bladder cancer, detection, cytology, NMP22, tumour marker

http://www.nomogram.org

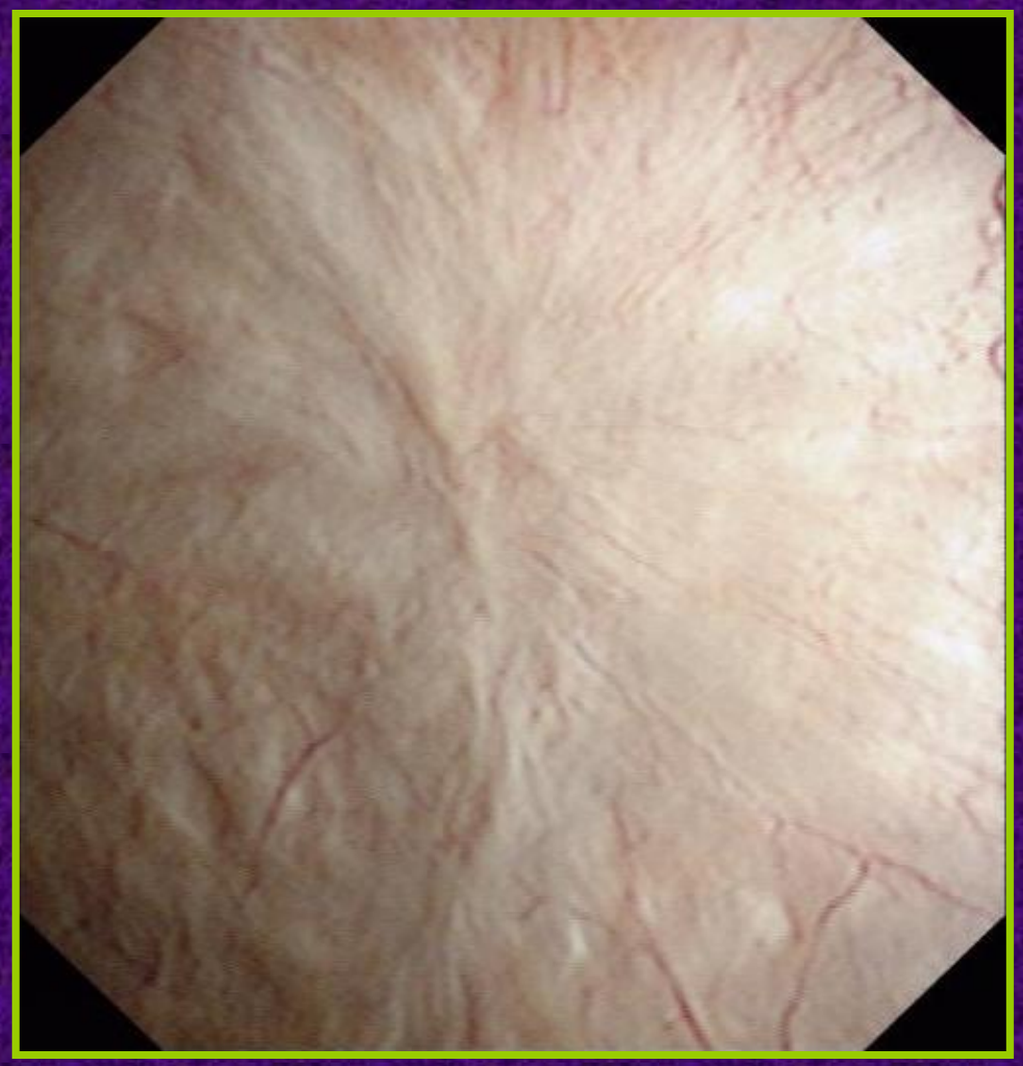
Lotan Y, et al. BJU Int. 2009;103:1368-74

Κλινικό παράδειγμα 2 (συνέχεια)

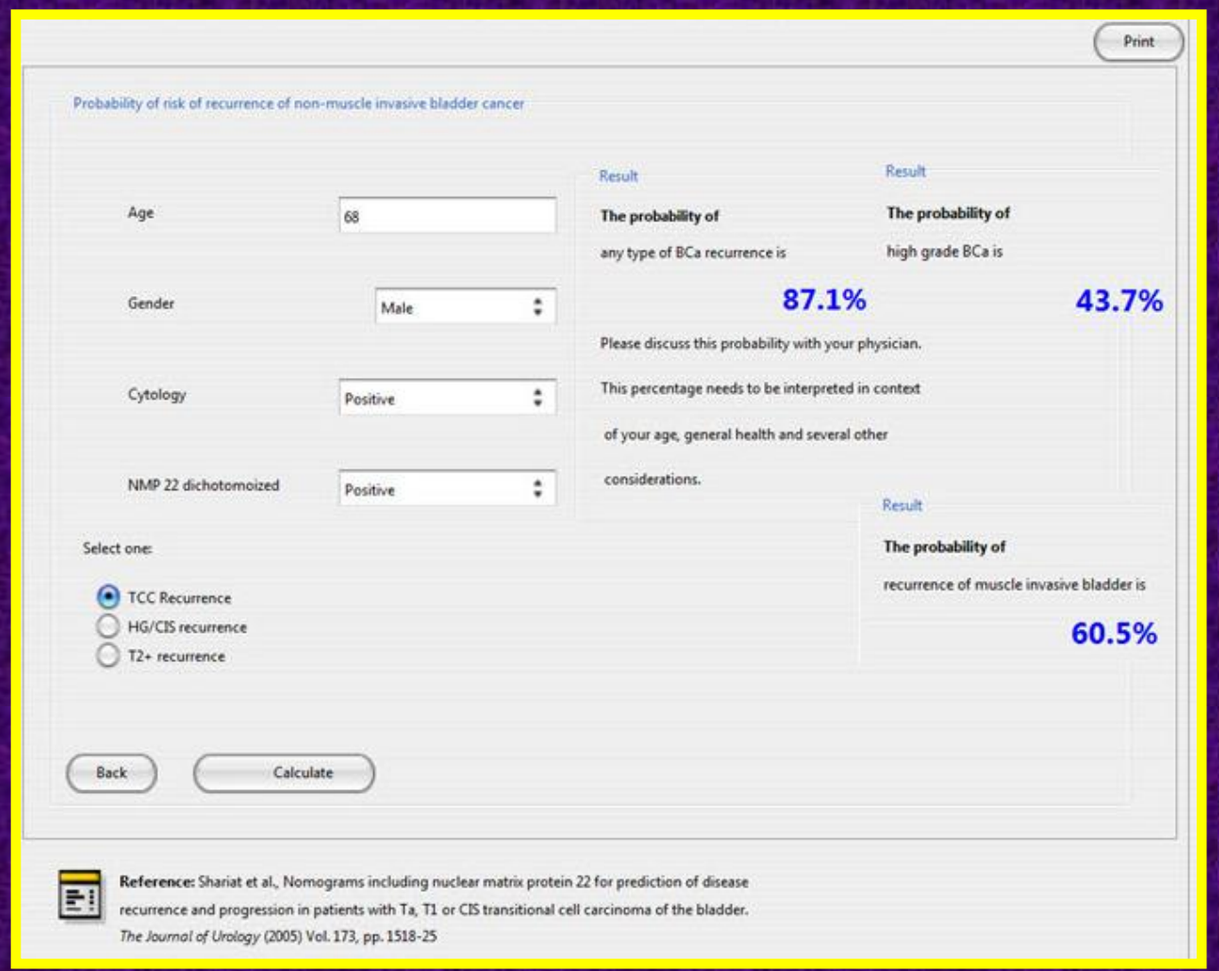
- σύσταση διακοπής καπνίσματος
- δύο χρόνια μετά: επεισόδιο μακροσκοπικής αιματουρίας
- έλεγχος με US: ύποπτη μάζα στην ουροδόχο κύστη
- κυστεοσκόπηση: Μονήρης όγκος > 3cm
- bladder wash out cytology:
- (ουροθηλιακό καρκίνωμα υψηλού βαθμού κακοήθειας)
- 1 εβδομάδα μετά: TUR-BT: T1G3

Κλινικό παράδειγμα 2 (συνέχεια)

- 4 εβδομάδες μετά:
- κυστεοσκόπηση: (-)
- bladder wash out cytology: (+) high grade
- NMP22 (+)



Υποτροπή/πρόδος μη-μυοδιηθητικού καρκίνου κύστης



NOMOGRAMS INCLUDING NUCLEAR MATRIX PROTEIN 22 FOR PREDICTION OF DISEASE RECURRENCE AND PROGRESSION IN PATIENTS WITH Ta, T1 OR CIS TRANSITIONAL CELL CARCINOMA OF THE BLADDER

SHAHROKH F. SHARIAT,*† CRAIG ZIPPE,‡ GERSON LÜDECKE,‡ HANS BOMAN,‡ MARTA SANCHEZ-CARBAYO,‡ ROBERTO CASELLA,‡ CHRISTINE MIAN,‡ MARTIN G. FRIEDRICH,‡ SANAA EISSA,‡ HIDEYUKI AKAZA,‡ IHOR SAWCZUK,‡ VINCENZO SERRETTA,‡ HARTWIG HULAND,‡ HANS HEDELIN,‡ RAINA RUPESH,‡ NAOTO MIYANAGA,‡ ARTHUR I. SAGALOWSKY,‡ FRANK WIANS, JR.,‡ CLAUS G. ROEHRBORN,‡ YAIR LOTAN,‡ PAUL PERROTTE,‡ SERGE BENAYOUN,‡ MICHAEL J. MARBERGER‡ AND PIERRE I. KARAKIEWICZ§

ABSTRACT

Purpose: We developed and validated nomograms that accurately predict disease recurrence and progression in patients with Ta, T1, or CIS transitional cell carcinoma (TCC) of the bladder using a large international cohort.

Methods: Univariate and multivariate logistic regression models targeted histologically confirmed disease recurrence, and focused on 2,542 patients with bladder TCC from 10 participating centers. Variables consisted of pre-cystoscopy voided urine Nuclear Matrix Protein 22 (NMP22) assay, urine cytology, age and gender. Resulting nomograms were internally validated with bootstrapping. Nomogram performance was explored graphically with Loess smoothing plots.

Results: Overall 957 patients had recurrent TCC. Tumor grade and stage was available for 898 patients, including 24% grade I, 43% grade II, and 33% grade III; 45% stage Ta, 32% T1 and/or CIS, and 23% T2 or greater. Bootstrap corrected predictive accuracy for any TCC recurrence was 0.842; grade III Ta/T1 or CIS was 0.869; and T2 or higher stage TCC of any grade was 0.858. Virtually perfect performance characteristics were observed for the nomograms predicting any TCC recurrence or grade III Ta/T1 or CIS. The nomogram predicting T2 or higher stage TCC overestimated the observed probability for predicted values greater than 45%.

Conclusions: We developed and internally validated nomograms that incorporate urinary NMP22, cytology, age and gender to predict with high accuracy the probability of disease recurrence and progression in patients with Ta, T1, and/or CIS bladder TCC. These nomograms could provide a means for individualizing followup in patients with Ta, T1, CIS bladder TCC.

http://www.nomogram.org

Shariat SF, et al. J Urol. 2005;173:1518-25

Υποτροπή/πρόδος μη-μυοδιηθητικού καρκίνου κύστης

Predicting Recurrence and Progression in Individual Patients with Stage Ta T1 Bladder Cancer Using EORTC Risk Tables: A Combined Analysis of 2596 Patients from Seven EORTC Trials

Richard J. Sylvester [a,*], *Adrian P.M. van der Meijden* [b], *Willem Oosterlinck* [c], *J. Alfred Witjes* [d], *Christian Bouffioux* [e], *Louis Denis* [f,1], *Donald W.W. Newling* [g,2], *Karlheinz Kurth* [h,3]

Abstract

Objectives: To provide tables that allow urologists to easily calculate a superficial bladder cancer patient's short- and long-term risks of recurrence and progression after transurethral resection.

Methods: A combined analysis was carried out of individual patient data from 2596 superficial bladder cancer patients included in seven European Organization for Research and Treatment of Cancer trials.

Results: A simple scoring system was derived based on six clinical and pathological factors: number of tumors, tumor size, prior recurrence rate, T category, carcinoma in situ, and grade. The probabilities of recurrence and progression at one year ranged from 15% to 61% and from less than 1% to 17%, respectively. At five years, the probabilities of recurrence and progression ranged from 31% to 78% and from less than 1% to 45%.

Conclusions: With these probabilities, the urologist can discuss the different options with the patient to determine the most appropriate treatment and frequency of follow-up.

Sylvester RJ, et al. Eur Urol. 2006;49:466-5

Υποτροπή/πρόδος μη-μυοδιηθητικού καρκίνου κύστης

EORTC Risk Tables For Stage Ta T1 Bladder Cancer

EORTC Risk Tables for Stage Ta T1 Bladder Cancer

Prior Reccurence Rate
- (•) Primary
- ( ) Recurrent <= 1 per year
- ( ) Recurrent > 1 per year

Number of Tumors
- (•) 1
- ( ) 2 to 7
- ( ) 8 or more

Tumor Diameter
- ( ) < 3 cm
- (•) >= 3 cm

T Category
- ( ) Ta
- (•) T1

Grade (WHO 1973)
- ( ) G1
- ( ) G2
- (•) G3

Concomitant CIS
- (•) No
- ( ) Yes

[Calculate Probabilities] [Clear] [Exit]

	1 Year	2 Years	3 Years	4 Years	5 Years
Probability of Recurrence	0.38	0.51	0.56	0.59	0.62
Probability of Progression	0.05	0.08	0.11	0.15	0.17

Reference: Sylvester RJ, van der Meijden APM, Oosterlinck W, Witjes JA, Bouffioux C, Denis L, Newling DWW, Kurth KH. Predicting recurrence and progression in individual patients with stage Ta T1 bladder cancer using EORTC risk tables: A combined analysis of 2596 patients from 7 EORTC trials. European Urology 49: 466-477, 2006.

Programmed by Richard Sylvester, EORTC Data Center, 83 avenue Mounier, 1200 Brussels, Belgium.

Version 1.0, January 2006

http://www.eortc.be/tools/bladdercalculator/download_disclaimer.htm

Sylvester RJ, et al. Eur Urol. 2006;49:466-5

Κλινικό παράδειγμα 2 (συνέχεια)

- 2 εβδομάδες μετά
  (6 εβδομάδες μετά αρχικό TUR-BT: re-TUR: T2 grade 3
- προτείνεται ριζική κυστεκτομή

Πιθανότητα τοπικής εξωκυστικής επέκτασης ή παρουσίας λεμφαδενικών μεταστάσεων

Precystectomy Nomogram for Prediction of Advanced Bladder Cancer Stage

Pierre I. Karakiewicz [a,*], *Shahrokh F. Shariat* [b], *Ganesh S. Palapattu* [c], *Paul Perrotte* [a], *Yair Lotan* [b], *Craig G. Rogers* [c], *Gilad E. Amiel* [d], *Amnon Vazina* [d], *Amit Gupta* [b], *Patrick J. Bastian* [c], *Arthur I. Sagalowsky* [b], *Mark Schoenberg* [c], *Seth P. Lerner* [d]

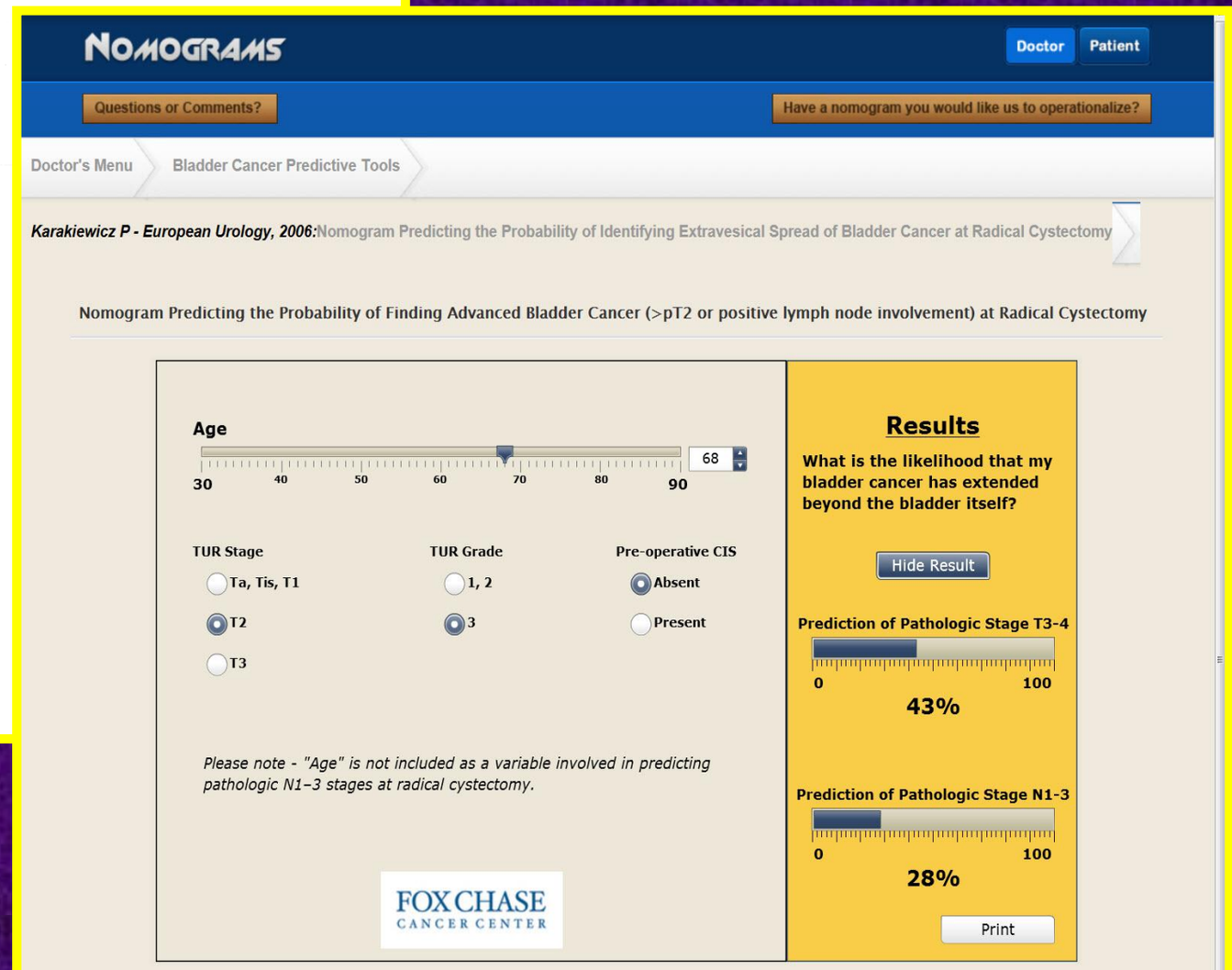
Abstract

Objective: To evaluate precystectomy prediction of pT and pN stages at cystectomy.

Methods: Multivariate logistic regression analyses modelled variables of 726 evaluable patients treated with radical cystectomy and bilateral pelvic lymphadenectomy. The first set of models predicted $pT_{3–4}$ stage at cystectomy, and the second set predicted $pN_{1–3}$ stages at cystectomy. Transurethral resection (TUR) predictors consisted of 2002 T stage, 1973 WHO tumour grade, presence of carcinoma in situ, age, gender, and delivery of neo-adjuvant chemotherapy. The area under the ROC curve quantified nomogram accuracy. Two hundred bootstrap resamples were used to reduce overfit bias.

Results: At TUR, 11% of patients were staged as $pT_{3–4}$ versus 42% at cystectomy. Lymph node metastases were found in 24% of patients at cystectomy ($pN_{1–3}$). The multivariate $pT_{3–4}$ nomogram was 75.7% accurate versus 71.4% for TUR T stage. The multivariate $pN_{1–3}$ nomogram was 63.1% accurate versus 61.0% for TUR T stage.

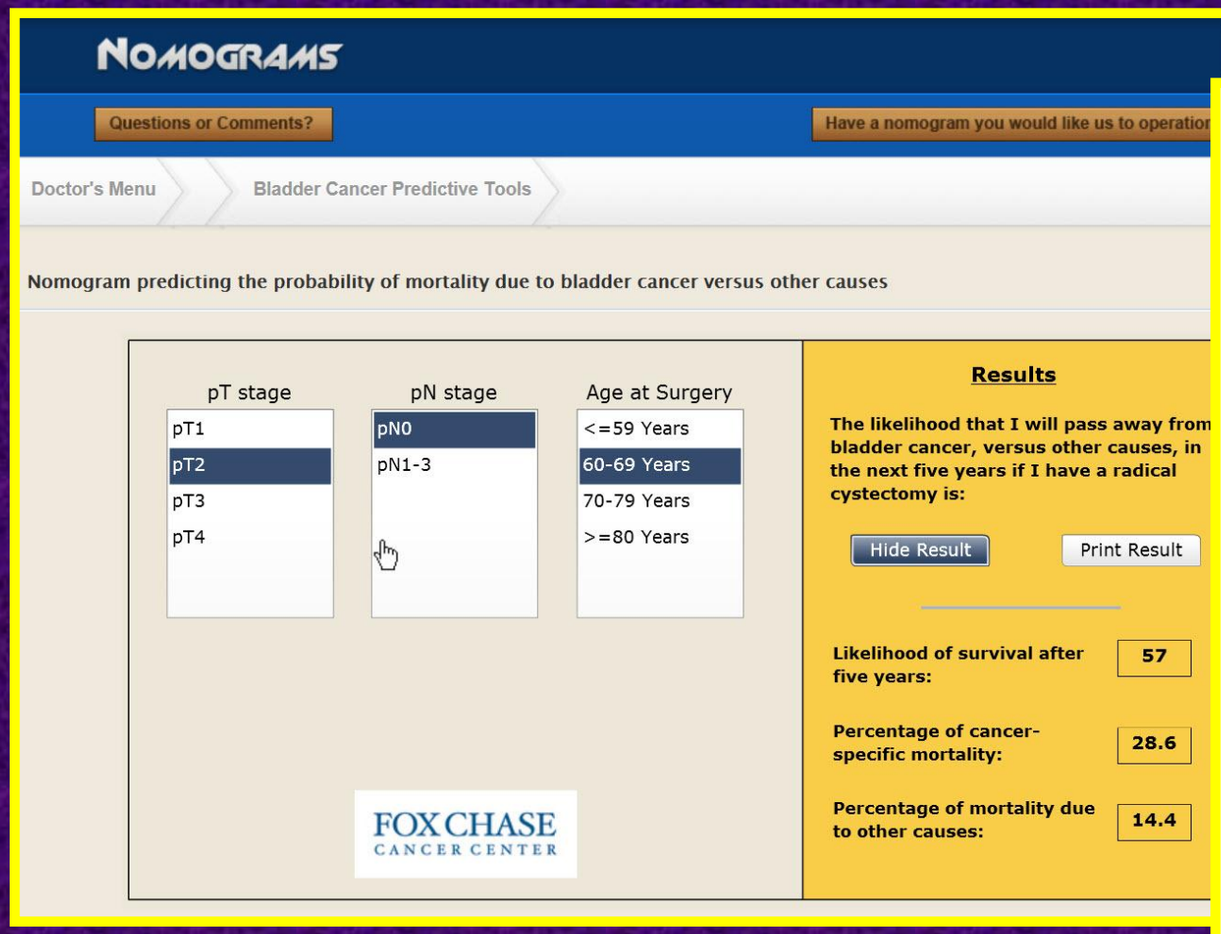
Conclusion: Multivariate nomograms are not perfect, but they do predict more accurately than TUR T stage alone.



http://labs.fccc.edu/nomograms/nomogram.php?id=40&audience=1

Karakiewicz PI, et al. Eur Urol. 2006;50:1254-60

Θνητότητα μετά από ριζική κυστεκτομή



A Population-Based Competing-Risks Analysis of the Survival of Patients Treated With Radical Cystectomy for Bladder Cancer

Giovanni Lughezzani, MD[1,2]; Maxine Sun, BSc[1]; Shahrokh F. Shariat, MD[3]; Lars Budäus, MD[1,4]; Rodolphe Thuret, MD[1,5]; Claudio Jeldres, MD[1,6]; Daniel Liberman, MD[1,6]; Francesco Montorsi, MD[2]; Paul Perrotte, MD[6]; and Pierre I. Karakiewicz, MD[1,6]

BACKGROUND. Patients treated with radical cystectomy represent a very heterogeneous group with respect to cancer-specific and other-cause mortality. Comorbidities and comorbidity-associated events represent very important causes of mortality in those individuals. The authors examined the rates of cancer-specific and other-cause mortality in a population-based radical cystectomy cohort. **METHODS.** The authors identified 11,260 patients treated with radical cystectomy for urothelial carcinoma of the urinary bladder between 1988 and 2006 within 17 Surveillance, Epidemiology, and End Results registries. Patients were stratified into 20 strata according to patient age and tumor stage at radical cystectomy. Smoothed Poisson regression models were fitted to obtain estimates of cancer-specific and other-cause mortality rates at specific time points after radical cystectomy. **RESULTS.** After stratification according to disease stage and patient age, cancer-specific mortality emerged as the main cause of mortality in all patient strata. Nonetheless, at 5 years after radical cystectomy, between 8.5% and 27.1% of deaths were attributable to other-cause mortality. The 3 most common causes of other-cause mortality were other malignancies, heart disease, and chronic obstructive pulmonary disease. The most prominent effect on cancer-specific mortality was exerted by locally advanced bladder cancer stages. Conversely, age was the main determinant of other-cause mortality. Interestingly, even after adjusting for bladder cancer pathologic stage, cancer-specific mortality was higher in older individuals than their younger counterparts. **CONCLUSIONS.** The current study provides a valuable graphical aid for prediction of cancer-specific and other-cause mortality according to disease stage and patient age. It can help clinicians to better stratify the risk-benefit ratio of radical cystectomy. Hopefully, these findings will be considered in treatment decision making and during informed consent before radical cystectomy. **Cancer 2011;117:103–9.** © *2010 American Cancer Society.*

http://labs.fccc.edu/nomograms/nomogram.php?id=48&audience=1

Lughezzani G, et al. Cancer. 2011;117:103-9

Κλινικό παράδειγμα 2 (συνέχεια)

- αποφασίζεται να γίνει ριζική κυστεκτομή

Κλινική Σταδιοποίηση (TNM 2009)

NOMOGRAMS

Doctor | Patient

Questions or Comments? | Have a nomogram you would like us to operationalize?

Doctor's Menu > NCCN Guidelines > Bladder

NCCN Guidelines for Bladder

NCCN Clinical Practice Guidelines in Oncology: Bladder Cancer v 1.2011

Initial Evaluation | NCCN/AUA Guidelines | Recommended Followup | Intravesical Tx Principles

Initial Evaluation

Clinical/Pathological Stage

- ○ Noninvasive disease (cTa, cT1)
- ◉ Muscle invasive (cT2, cT3, cT4)
- ○ Metastatic *
- ○ Urothelial of prostate

- H&P
- Office cystoscopy
- Cytology
- Complete blood count (CBC)
- Chemistry profile, including alkaline phosphatase
- Chest imaging
- Imaging of upper tract collecting system **
- Abdominal/pelvic CT or MRI
- Bone scan if alkaline phosphatase elevated or symptoms

Bladder Cancer Staging: AJCC TNM Staging for Bladder Cancer

Bladder Cancer Predictive Tools: Open available nomograms

* *Metastatic is mapped to muscle invasive. See NCCN guidelines for treatment*

** *Imaging may include one or more of the following: IVP, CT urography, renal ultrasound with retrograde pyelogram, ureteroscopy, MRI urogram*

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NOMOGRAMS

Doctor | Patient

Questions or Comments? | Have a nomogram you would like us to operationalize?

Doctor's Menu > AJCC Version 7 TNM Staging > TNM v7 Staging for Bladder

Tumor Staging – Bladder AJCC v7

Pathologic Staging (pTNM)

AJCC/UICC TNM, 7th edition

Protocol web posting date: October 2009

Kidney | Prostate | Bladder | Testicular | Adrenal | Renal Pelvis | Penile

Click to Use Pathologic Stage | Hide Result | Print Result

Tumor - Clinical	Node	Metastasis
TX	NX	M0
T0	N0	M1
Ta	N1	
Tis	N2	
T1	N3	
T2		
T3		
T4a		
T4b		

FOX CHASE CANCER CENTER

Tumor | Node | Metastasis

Tumor - Clinical	
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Ta	Noninvasive papillary carcinoma
Tis	Carcinoma in situ: "flat tumor"
T1	Tumor invades subepithelial connective tissue
T2	Tumor invades muscularis propria
T3	Tumor invades perivesical tissue
T4a	Tumor invades prostatic stroma, uterus, vagina
T4b	Tumor invades pelvic wall, abdominal wall
Tumor - Pathologic	
pT2a	Tumor invades superfi cial muscularis propria (inner half)

Result:		
Stage II	**T2**	Tumor invades muscularis propria
	N0	No lymph node metastasis
	M0	No distant metastasis

http://labs.fccc.edu/nomograms/nomogram.php?id=54&audience=1&status=1

Κλινικό παράδειγμα 2 (συνέχεια)

- ριζική κυστεκτομή 2 εβδομάδες αργότερα (9 εβδομάδες μετά τη διάγνωση)

Ιστοπαθολογική Σταδιοποίηση (TNM 2009)

NOMOGRAMS

Doctor | Patient

Questions or Comments? | Have a nomogram you would like us to operationalize?

Doctor's Menu > AJCC Version 7 TNM Staging > TNM v7 Staging for Bladder

Tumor Staging – Bladder AJCC v7

Pathologic Staging (pTNM)

AJCC/UICC TNM, 7th edition

Protocol web posting date: October 2009

Kidney | Prostate | **Bladder** | Testicular | Adrenal | Renal Pelvis | Penile

Click to Use Clinical Stage | Hide Result | Print Result

Tumor - Pathologic	Node	Metastasis
pT2a	NX	M0
pT2b	**N0**	M1
pT3a	N1	
pT3b	N2	
	N3	

FOX CHASE CANCER CENTER

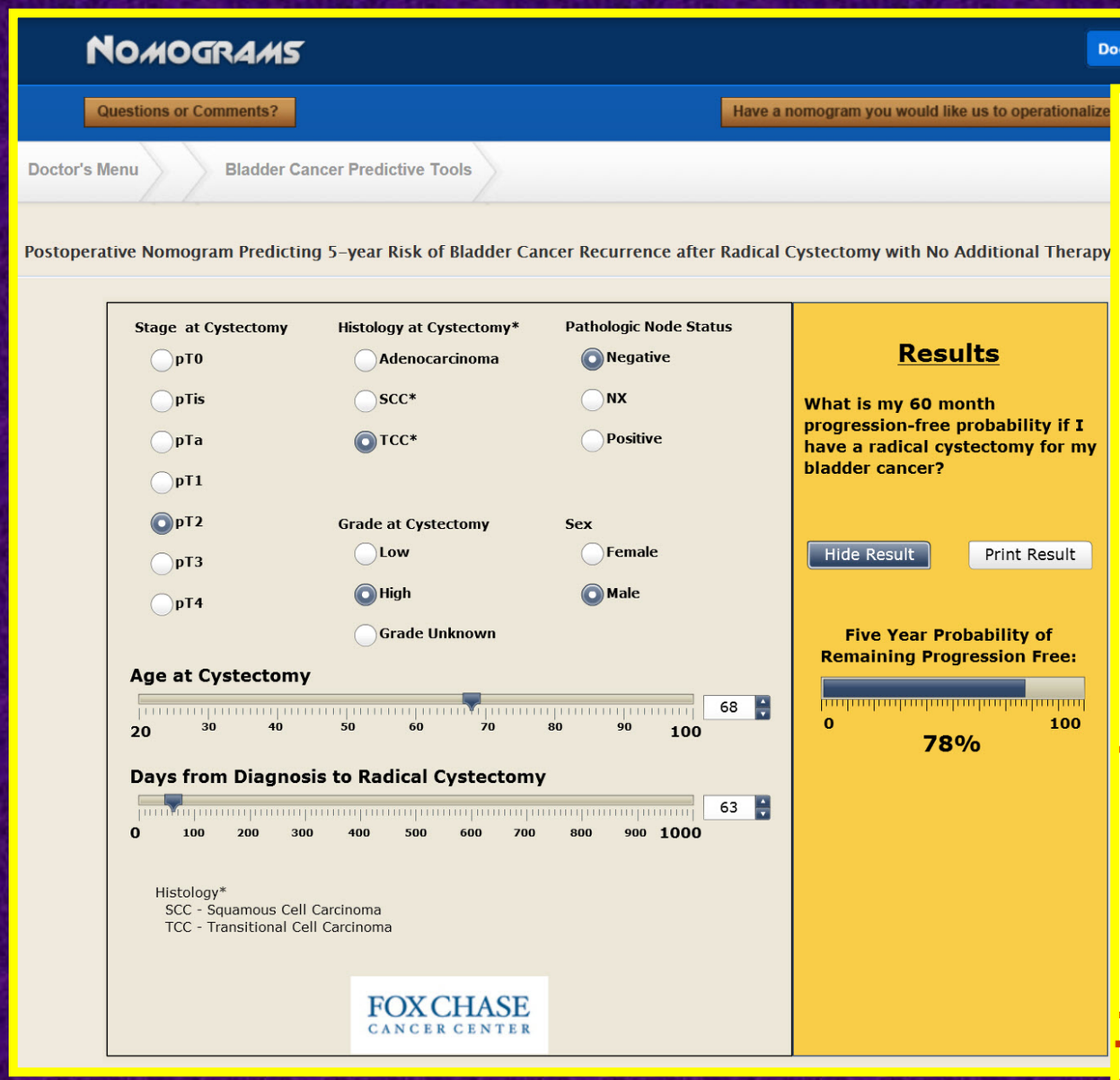
Tumor | Node | Metastasis

Tumor - Clinical	
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Ta	Noninvasive papillary carcinoma
Tis	Carcinoma in situ: "flat tumor"
T1	Tumor invades subepithelial connective tissue
T2	Tumor invades muscularis propria
T3	Tumor invades perivesical tissue
T4a	Tumor invades prostatic stroma, uterus, vagina
T4b	Tumor invades pelvic wall, abdominal wall
Tumor - Pathologic	
pT2a	Tumor invades superfi cial muscularis propria (inner half)

Result: **Stage II**	**pT2b**	Tumor invades deep muscularis propria (outer half)
	N0	No lymph node metastasis
	M0	No distant metastasis

http://labs.fccc.edu/nomograms/nomogram.php?id=54&audience=1&status=1

Κίνδυνος υποτροπής μετά από ριζική κυστεκτομή



Postoperative Nomogram Predicting Risk of Recurrence After Radical Cystectomy for Bladder Cancer

International Bladder Cancer Nomogram Consortium

A B S T R A C T

Purpose

Radical cystectomy and pelvic lymphadenectomy (PLND) remains the standard treatment for localized and regionally advanced invasive bladder cancers. We have constructed an international bladder cancer database from centers of excellence in the management of bladder cancer consisting of patients treated with radical cystectomy and PLND. The goal of this study was the development of a prognostic outcomes nomogram to predict the 5-year disease recurrence risk after radical cystectomy.

Patients and Methods

Institutional radical cystectomy databases containing detailed information on bladder cancer patients were obtained from 12 centers of excellence worldwide. Data were collected on more than 9,000 postoperative patients and combined into a relational database formatted with patient characteristics, pathologic details of the pre- and postcystectomy specimens, and recurrence and survival status. Patients with available information for all selected study criteria were included in the formation of the final prognostic nomogram designed to predict 5-year progression-free probability.

Results

The final nomogram included information on patient age, sex, time from diagnosis to surgery, pathologic tumor stage and grade, tumor histologic subtype, and regional lymph node status. The predictive accuracy of the constructed international nomogram (concordance index, 0.75) was significantly better than standard American Joint Committee on Cancer TNM (concordance index, 0.68; $P < .001$) or standard pathologic subgroupings (concordance index, 0.62; $P < .001$).

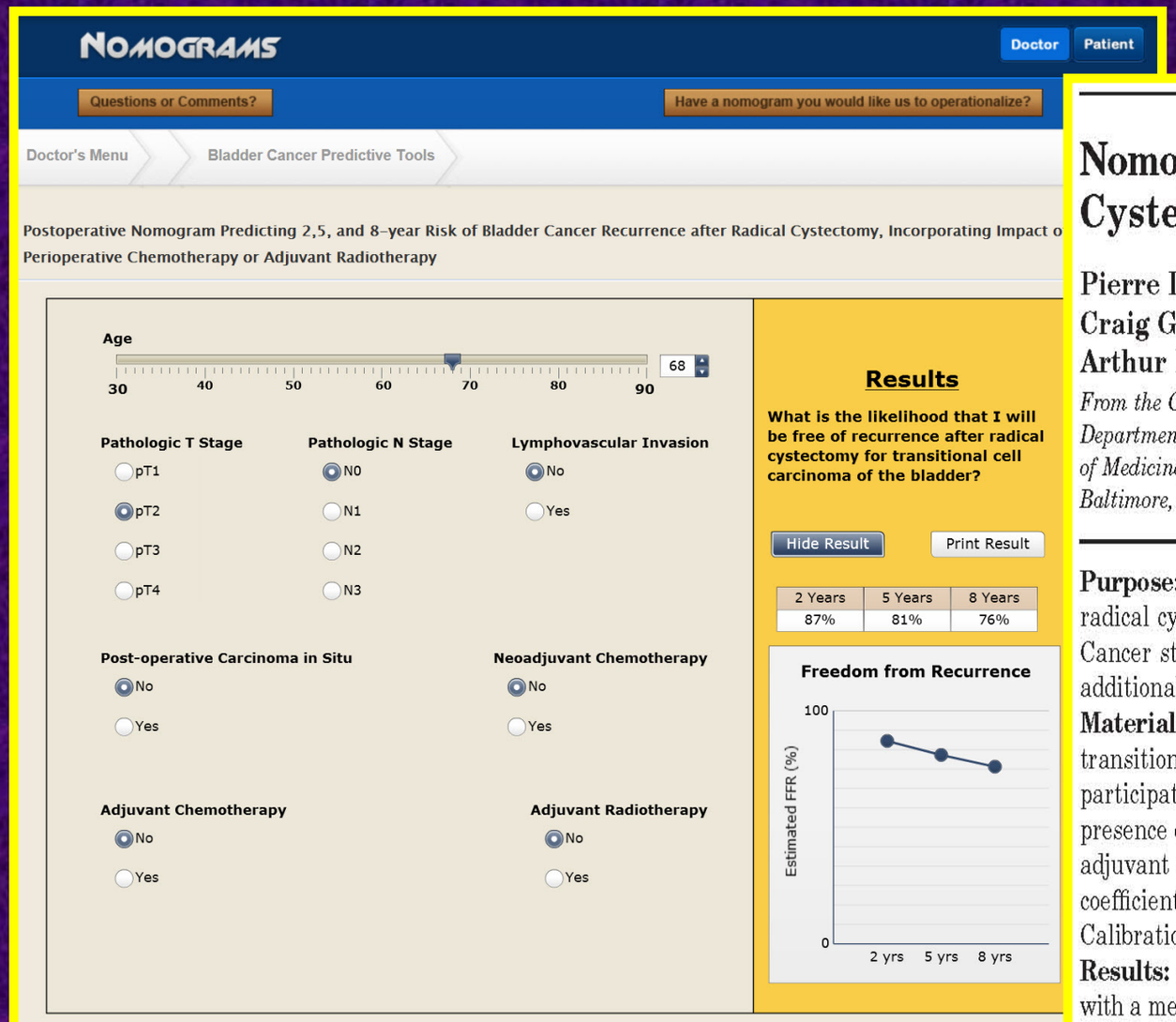
Conclusion

We have developed an international bladder cancer nomogram predicting recurrence risk after radical cystectomy for bladder cancer. The nomogram outperformed prognostic models that use standard pathologic subgroupings and should improve our ability to provide accurate risk assessments to patients after the surgical management of bladder cancer.

http://labs.fccc.edu/nomograms/nomogram.php?id=37&audience=1

Bochner BH, et al. J Clin Oncol. 2006;24:3967-72

Κίνδυνος υποτροπής μετά από ριζική κυστεκτομή



Nomogram for Predicting Disease Recurrence After Radical Cystectomy for Transitional Cell Carcinoma of the Bladder

Pierre I. Karakiewicz,*,† Shahrokh F. Shariat,*,‡ Ganesh S. Palapattu, Amiel E. Gilad, Yair Lotan, Craig G. Rogers, Amnon Vazina, Amit Gupta, Patrick J. Bastian, Paul Perrotte, Arthur I. Sagalowsky,§ Mark Schoenberg‖ and Seth P. Lerner¶,**

From the Cancer Prognostics and Health Outcomes Unit, University of Montreal, Montreal, Quebec, Canada (PIK, YL, AG, PP, AIS), the Department of Urology, University of Texas Southwestern Medical Center, Dallas (SFS), The Scott Department of Urology, Baylor College of Medicine, Houston (AEG, AV, SPL), Texas, and the James Buchanan Brady Urological Institute, The Johns Hopkins Hospital, Baltimore, Maryland (GSP, CGR, PJB, MS)

Purpose: American Joint Committee on Cancer staging represents the gold standard for prediction of recurrence after radical cystectomy in patients with invasive bladder cancer. We tested the hypothesis that American Joint Committee on Cancer stage based predictions may be improved when pathological tumor and node stage information is combined with additional clinical and pathological variables within a prognostic nomogram.

Materials and Methods: We used Cox proportional hazards regression analysis to model variables of 728 patients with transitional cell carcinoma of the bladder treated with radical cystectomy and bilateral pelvic lymphadenectomy at 1 of 3 participating institutions. Standard predictors, pT and pN, were complemented by age, gender, tumor grade at cystectomy, presence of lymphovascular invasion, presence of carcinoma in situ in the cystectomy specimen, neoadjuvant chemotherapy, adjuvant chemotherapy and adjuvant radiotherapy. The concordance index was used to quantify the accuracy of regression coefficient based nomograms. A total of 200 bootstrap resamples were used to reduce overfit bias and for internal validation. Calibration plots were used to graphically explore the performance characteristics of the multivariate nomogram.

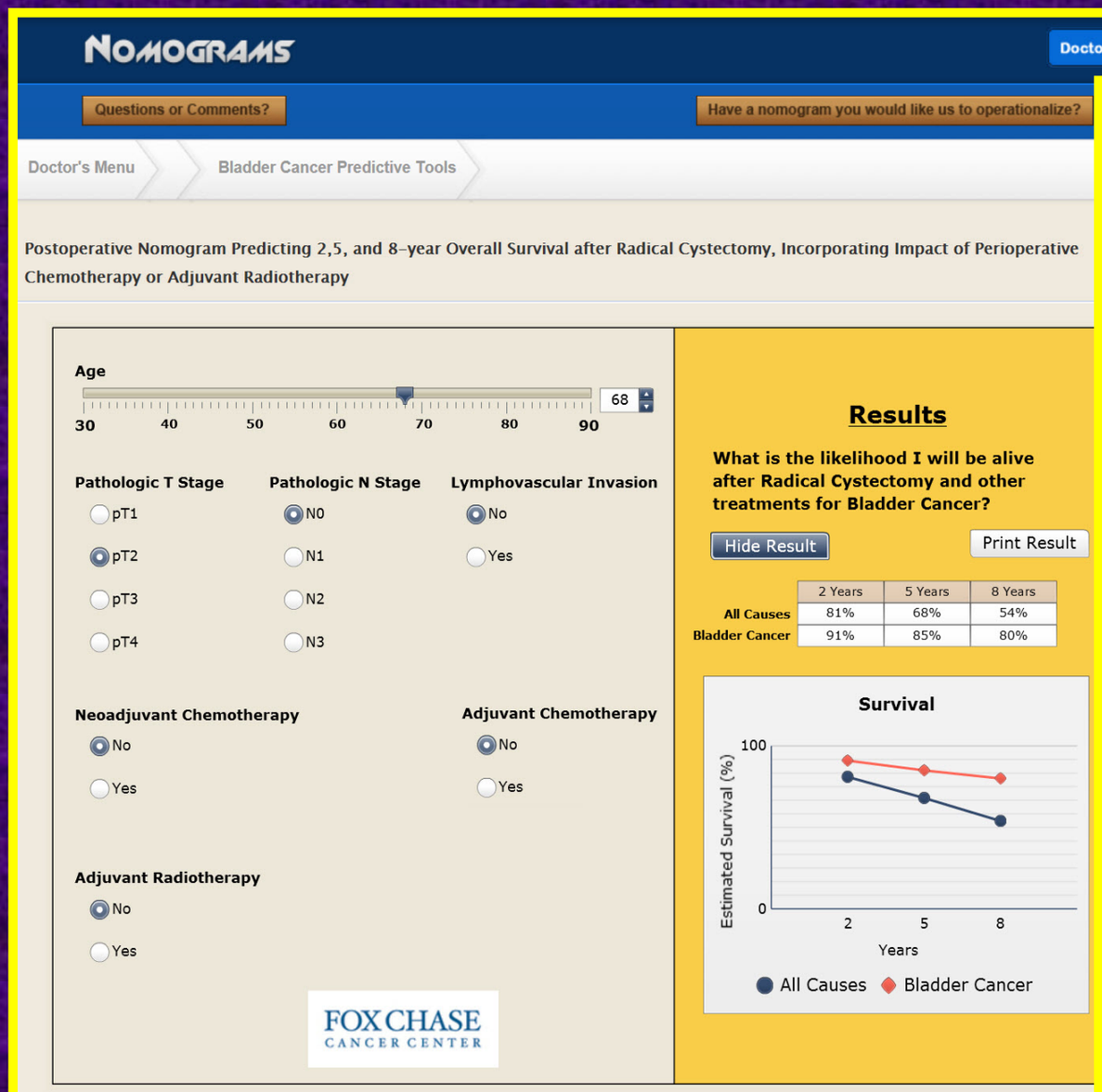
Results: Followup ranged from 0.1 to 183.4 months (median 24.9, mean 36.4). Recurrence was recorded in 249 (34.2%) patients with a median time to recurrence of 108 months (range 0.8 to 131.9). Actuarial recurrence-free probabilities were 69.6% (95% CI 65.8%–73.0%), 60.2% (55.8%–64.3%) and 52.9% (47.3%–58.1%) at 2, 5 and 8 years after cystectomy, respectively. Two-hundred bootstrap corrected predictive accuracy of American Joint Committee on Cancer stage based predictions was 0.748. Accuracy increased by 3.2% (0.780) when age, lymphovascular invasion, carcinoma in situ, neoadjuvant chemotherapy, adjuvant chemotherapy and adjuvant radiotherapy were added to pathological stage information and used within a nomogram.

Conclusions: A nomogram predicting bladder cancer recurrence after cystectomy is 3.2% more accurate than American Joint Committee on Cancer stage based predictions. Moreover, a nomogram approach combines several advantages such as easy and precise estimation of individual recurrence probability at key points after cystectomy, which all patients deserve to know and all treating physicians need to know.

http://labs.fccc.edu/nomograms/nomogram.php?id=38&audience=1

Karakiewicz PI, et al. J Urol. 2006;176:1354-61

Επιβίωση μετά από ριζική κυστεκτομή



Nomograms Provide Improved Accuracy for Predicting Survival after Radical Cystectomy

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Aims: To develop multivariate nomograms that determine the probabilities of all-cause and bladder cancer–specific survival after radical cystectomy and to compare their predictive accuracy to that of American Joint Committee on Cancer (AJCC) staging.

Methods: We used Cox proportional hazards regression analyses to model variables of 731 consecutive patients treated with radical cystectomy and bilateral pelvic lymphadenectomy for bladder transitional cell carcinoma. Variables included age of patient, gender, pathologic stage (pT), pathologic grade, carcinoma *in situ*, lymphovascular invasion (LVI), lymph node status (pN), neoadjuvant chemotherapy (NACH), adjuvant chemotherapy (ACH), and adjuvant external beam radiotherapy (AXRT). Two hundred bootstrap resamples were used to reduce overfit bias and for internal validation.

Results: During a mean follow-up of 36.4 months, 290 of 731 (39.7%) patients died; 196 of 290 patients (67.6%) died of bladder cancer. Actuarial all-cause survival estimates were 56.3% [95% confidence interval (95% CI), 51.8-60.6%] and 42.9% (95% CI, 37.3-48.4%) at 5 and 8 years after cystectomy, respectively. Actuarial cancer-specific survival estimates were 67.3% (62.9-71.3%) and 58.7% (52.7-64.2%) at 5 and 8 years, respectively. The accuracy of a nomogram for prediction of all-cause survival (0.732) that included patient age, pT, pN, LVI, NACH, ACH, and AXRT was significantly superior ($P = 0.001$) to that of AJCC staging–based risk grouping (0.615). Similarly, the accuracy of a nomogram for prediction of cancer-specific survival that included pT, pN, LVI, NACH, and AXRT (0.791) was significantly superior ($P = 0.001$) to that of AJCC staging–based risk grouping (0.663).

Conclusions: Multivariate nomograms provide a more accurate and relevant individualized prediction of survival after cystectomy compared with conventional prediction models, thereby allowing for improved patient counseling and treatment selection.

http://labs.fccc.edu/nomograms/nomogram.php?id=39&audience=1

Shariat SF, et al. Clin Cancer Res. 2006;12:6663-76

Παρακολούθηση

NOMOGRAMS

Doctor | Patient

Questions or Comments? | Have a nomogram you would like us to operationalize?

Doctor's Menu > NCCN Guidelines > Bladder

NCCN Guidelines for Bladder

NCCN Clinical Practice Guidelines in Oncology: Bladder Cancer v 1.2011

Initial Evaluation | NCCN/AUA Guidelines | Recommended Followup | Intravesical Tx Principles

Recommended Followup

Stage

- Ta
- T1
- Tis
- T2
- T3
- T4
- Metastatic

Treatment

- Radical Cystectomy
- Partial Cystectomy
- No Cystectomy

Grading Notes | Imaging Notes

Imaging may include one or more of the following:
- IVP
- CT urography
- renal ultrasound with retrograde pyelogram
- ureteroscopy
- MRI urogram

Probability of Recurrence in 5 years: not available

Probability of Progression to Muscle Invasion: not available

Bladder Cancer Predictive Tools:

Open available nomograms

FOLLOW-UP	once	every 3 mo	every 3-6 mo	every 3-12 mo	every 6-12 mo	every 12 mo	every 12-24 mo	Comments
Cystoscopy								
Urethral wash cytology					X			particularly if Tis was found within the bladder or prostatic urethra
Urine cytology			X					for 2 y and then as clinically indicated
Serum chemistries with creatinine			X					for 2 y and then as clinically indicated
Liver function tests								
Imaging of upper tracts								
Imaging of the chest				X				for 2 y depending on risk or recurrence, then as clinically indicated
Imaging of abdomen and pelvis				X				for 2 y depending on risk or recurrence, then as clinically indicated
Monitoring of vitamin B12 deficiency						X		If a continent diversion was created
Selected mapping biopsy								

http://labs.fccc.edu/nomograms/nomogram.php?id=54&audience=1&status=1

ΕΥΧΑΡΙΣΤΩ