

## AGREEMENT BETWEEN PHYSICIAN AND ADVANCED CANCER PATIENT PERFORMANCE STATUS RATINGS IN A PALLIATIVE CARE OUTPATIENT SETTING

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## Introduction

### ONCOLOGY

- Accurate rating of patients' performance status (PS) can influence **clinical decisions**, such as **eligibility for standard treatments or clinical trials**.

### PALLIATIVE CARE

- Accurate prognostication is important for **timely advanced care planning** discussions and to facilitate **transitions to end-of-life care**.

## Common scales

- **Palliative Performance Scale (PPS)**
- **Eastern Cooperative Oncology Group (ECOG)**
- **Karnofsky Performance Scale (KPS)**

- *valid and reliable*

- *correlate well with survival*

- *poor sensitivity at the lower ends, suggesting inaccuracies for patients nearing the end of life*

## Previous studies

- Inter-rater agreement
  - *between different Health Care providers*
  - *between Physician-rated vs Patient-rated PS measures* increasingly available
- **Oncology** setting
- **Smaller** studies
- **Inconclusive** results
- **Limited** to one or two cancer sites

Loprinzi CL, Laurie JA, Wiesand HS, Krook JE, Novotny PJ, Kugler JW, et al. Prospective evaluation of prognostic variables from patient-completed questionnaires. North Central Cancer Treatment Group. J Clin Oncol 1994 Mar;12(3):601-7.

## PATIENT - REPORTED version of the ECOG

- Patients should be able to provide an accurate assessment of their own performance status.
- Could be a useful clinical instrument to assist with survival prediction, treatment selection and overall quality of life assessment in patients with cancer.

Slevin ML, Plant H, Lynch D, Drinkwater J, Gregory WM. Who should measure quality of life, the doctor or the patient? Br J Cancer 1988;57:109-12.

## Study objective

- To assess agreement between the physician-reported ECOG and the patient-reported functional status measure (PRFS) based on the ECOG in an outpatient oncology palliative care clinic (OPCC).
- To examine factors associated with a difference in patient - versus physician - rated PS measures.

## Methods

- The outpatient oncology palliative care clinic (OPCC) at Princess Margaret Cancer Centre, Toronto, Ontario
- 949 patients with a visit between August 1, 2013 to December 31, 2014

| Palliative care physicians | Patients    |
|----------------------------|-------------|
| ECOG                       | ESAS-r-CS   |
| PPS                        | PRFS (ECOG) |

ECOG is a 6-point scale based on patients' capability for self-care, daily activity and physical ability

|   |                                                                                                                                 |
|---|---------------------------------------------------------------------------------------------------------------------------------|
| 0 | fully active, able to carry on all pre-disease performance without restriction                                                  |
| 1 | restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature            |
| 2 | ambulatory and capable of all self-care but unable to carry out any work activities; up and about more than 50% of waking hours |
| 3 | capable of only limited self-care; confined to bed or chair more than 50% of waking hours                                       |
| 4 | completely disabled; cannot carry on any self-care; totally confined to bed or chair                                            |
| 5 | DEAD                                                                                                                            |

PRFS is a 5-point measure of performance status, based on the ECOG but expressed in lay language, in which patients assess their own level of functioning

|   |                                                                               |
|---|-------------------------------------------------------------------------------|
| 0 | normal with no limitations                                                    |
| 1 | not my normal self, but able to be up and about with fairly normal activities |
| 2 | not feeling up to most things, but in bed or chair less than half the day     |
| 3 | able to do little activity and spend most of the day in bed or chair          |
| 4 | pretty much bedridden, rarely out of bed                                      |

Martin L, Watanabe S, Feinsinger R, Lau F, Ghosh S, Quan H, et al. Prognostic factors in patients with advanced cancer: Use of the patient-generated subjective global assessment in survival prediction. J Clin Oncol 2010;28:4376-83.

## Methods

- Patients **independently** completed the PRFS tool, which was **collected separately** from the ECOG so that physicians and patients **were blind to each other's performance status measures**.
- Demographics, primary cancer diagnosis, reason for palliative care referral and referring service were **collected from the UHN palliative care clinical database**.
- Vital status was obtained through the **UHN electronic patient record, the UHN Cancer Registry, and an online obituary search**.

## Analysis

- Demographic and clinical variables** were summarized using **descriptive statistics**.
- Agreement between ECOG and PRFS** was assessed using weighted **Kappa statistics**.
- The **Bland-Altman** method was used to demonstrate the **agreement between the two ratings**.
- The **statistical difference** between the two ratings was tested using a **paired t-test**.
- Univariable and multivariable linear regression** was performed to determine **factors associated with the difference between PRFS and ECOG ratings**.
- Covariates that were investigated included **patient age, gender, cancer site, reason for palliative care referral and EDS**.
- The **ESAS Distress Score (EDS)** is calculated by **summing the main nine ESAS symptom severity scores, with prorating of scores when more than 50% of the items are completed**.

## Results

- The **median age** of participants was 65 years (20-98).
- 81.3% were referred to the OPCC for **pain or symptom management**.

| Characteristic              | N (%)            |
|-----------------------------|------------------|
| Age, median (range)         | 65.0 (20.0-98.0) |
| Sex (Male)                  | 482 (80.8)       |
| <b>Primary disease site</b> |                  |
| Gastrointestinal            | 240 (25.3)       |
| Lung                        | 181 (19.1)       |
| Gynecological               | 111 (11.7)       |
| Genitourinary               | 91 (9.6)         |
| Head and neck               | 84 (8.9)         |
| Breast                      | 80 (8.9)         |
| Central nervous s.          | 36 (3.8)         |
| Myeloma                     | 28 (3.0)         |
| Skin                        | 27 (2.8)         |
| Lymphoma                    | 20 (2.1)         |
| Leukemia                    | 16 (1.7)         |
| Unknown                     | 35 (3.7)         |
| <b>Reason for referral</b>  |                  |
| Symptom control             | 471 (49.6)       |
| Pain                        | 301 (31.7)       |
| Palliative planning         | 164 (17.3)       |
| Terminal care               | 13 (1.4)         |
| <b>Referring service</b>    |                  |
| Medical oncology            | 603 (63.5)       |
| Radiation oncology          | 201 (21.2)       |
| Surgical oncology           | 60 (6.3)         |
| Hematology                  | 47 (5.0)         |
| Psychosocial Oncology       | 18 (1.9)         |
| Other*                      | 20 (2.1)         |

\*Other referring services include cardiologist, internal medicine, and unknown

## Results

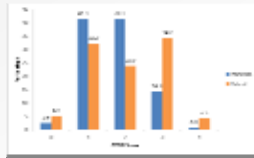
- Overall, patients' **symptom distress scores were moderate** (mean ESAS distress score 34.1 ± 17.7).
- Fatigue** was rated as the most severe symptom (5.5 ± 2.8), followed by **poor sense of well-being** (4.9 ± 2.5), **pain** (4.4 ± 3.1) and **loss of appetite** (4.4 ± 3.0).

Patient reported symptoms, individual item range 0-10

| Symptom             | Mean ± SD (N)       | Median (IQR)     |
|---------------------|---------------------|------------------|
| EDS*                | 34.1 ± 17.7 (N=904) | 32.0 (20.5-47.0) |
| ETS**               | 40.9 ± 21.1 (N=905) | 40.0 (25.0-56.0) |
| Pain                | 4.4 ± 3.1 (N=899)   | 4.0 (2.0-7.0)    |
| Tiredness           | 5.5 ± 2.8 (N=899)   | 6.0 (3.0-8.0)    |
| Nausea              | 1.8 ± 2.5 (N=896)   | 0.0 (0.0-3.0)    |
| Depression          | 3.2 ± 2.9 (N=896)   | 3.0 (0.0-5.0)    |
| Anxiety             | 3.3 ± 2.9 (N=895)   | 3.0 (0.0-5.0)    |
| Drowsiness          | 3.9 ± 3.0 (N=897)   | 4.0 (1.0-6.0)    |
| Appetite            | 4.4 ± 3.0 (N=900)   | 5.0 (2.0-7.0)    |
| Wellbeing           | 4.9 ± 2.5 (N=886)   | 5.0 (3.0-7.0)    |
| Shortness of breath | 3.0 ± 2.9 (N=902)   | 2.0 (0.0-5.0)    |
| Constipation        | 3.0 ± 3.1 (N=890)   | 2.0 (0.0-5.0)    |
| Sleep               | 3.9 ± 3.2 (N=892)   | 4.0 (1.0-7.0)    |

## Results

- Weighted Kappa statistics indicated **moderate inter-rater agreement at 0.32** (95%CI: 0.28-0.36).
- Total agreement** between physicians and patients occurred in **42%** (398/949) of assessments.
- 41%** of patients rated their performance status as worse.
- 17%** of patients rated their performance better than did physicians.



| Physician ECOG score | Count | %      |
|----------------------|-------|--------|
| 0                    | 25    | (2.6)  |
| 1                    | 392   | (41.3) |
| 2                    | 390   | (41.1) |
| 3                    | 136   | (14.3) |
| 4                    | 6     | (0.6)  |

| Patient ECOG score | Count | %      |
|--------------------|-------|--------|
| 0                  | 51    | (5.4)  |
| 1                  | 306   | (32.2) |
| 2                  | 227   | (23.9) |
| 3                  | 325   | (34.2) |
| 4                  | 40    | (4.2)  |

## Results

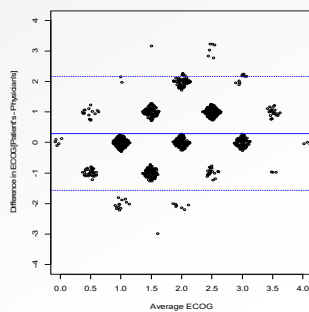
- The **worst agreement** was found for **ECOG 0** (5 of 25 patients rated 0 by physicians also rated 0 themselves, 20% agreement).
- The **highest agreement** was in those with physician-rated **ECOG 3** (87/136 patients, 64% agreement).

The distribution of ECOG scores for the individual observers

| Physicians' score | Patients' score |     |     |     |    | Total |
|-------------------|-----------------|-----|-----|-----|----|-------|
|                   | 0               | 1   | 2   | 3   | 4  |       |
| 0                 | 5               | 17  | 2   | 1   | 0  | 25    |
| 1                 | 32              | 193 | 96  | 65  | 6  | 392   |
| 2                 | 13              | 89  | 110 | 169 | 9  | 390   |
| 3                 | 1               | 7   | 19  | 87  | 22 | 136   |
| 4                 | 0               | 0   | 0   | 3   | 3  | 6     |
| Total             | 51              | 306 | 227 | 325 | 40 | 949   |

## Results

- The **solid line** shows the average difference between patient's and physician's rating, and the **dotted lines** show upper and lower 95% agreement limits.
- On average, **patients rated their ECOG worse by 0.31 points** (95% CI: 0.25-0.37).
- The upper agreement limit was 2.2 (95% CI 2.1, 2.3), and the lower agreement limit was -1.5 (95% CI: -1.6, -1.4).



## Results

- In multivariate regression analysis **patient age was negatively associated** ( $p < 0.002$ ), and **EDS positively associated** ( $p < 0.0001$ ), with the difference between the patient's and physician's ratings.
- Median age (65 years)** and **median EDS (33)** were used as cut-off values to further evaluate how age and EDS were associated with the difference in reporting performance status.
- Younger patients** (<65 years) were more likely to report worse scores than physicians (217/449 [48%] versus 170/500 [34%] of those  $\geq 65$  years old).
- Patients with higher symptom burden** (EDS  $\geq 33$ ) were more likely to report worse scores than physicians (237/457 [52%] vs. 131/449 [29%] with EDS <33).

Univariable and multivariable analyses of factors associated with patient versus physician-reported ECOG, N=949

| Variables               | Univariable analysis |      |        | Multivariable analysis |      |        |
|-------------------------|----------------------|------|--------|------------------------|------|--------|
|                         | Beta                 | SE   | pValue | Beta                   | SE   | pValue |
| Age, per 10 years       | -0.11                | 0.02 | <.0001 | -0.08                  | 0.02 | 0.002  |
| Sex, female             | -0.001               | 0.06 | 0.99   |                        |      |        |
| Primary disease site    |                      |      |        |                        |      |        |
| Breast                  | 0.00                 | 0.14 | 1.00   |                        |      |        |
| Central nervous system  | -0.33                | 0.18 | 0.06   |                        |      |        |
| Gastrointestinal        | -0.05                | 0.11 | 0.61   |                        |      |        |
| Genitourinary           | -0.21                | 0.13 | 0.11   |                        |      |        |
| Head and neck           | -0.21                | 0.13 | 0.12   |                        |      |        |
| Leukemia                | 0.24                 | 0.25 | 0.34   |                        |      |        |
| Lung                    | -0.11                | 0.11 | 0.34   |                        |      |        |
| Lymphoma                | 0.16                 | 0.22 | 0.47   |                        |      |        |
| Myeloma                 | 0.08                 | 0.20 | 0.69   |                        |      |        |
| Skin                    | -0.42                | 0.20 | 0.03   |                        |      |        |
| Unknown                 | 0.19                 | 0.23 | 0.40   |                        |      |        |
| Gynecological           | -                    | -    | -      |                        |      |        |
| Reason for referral     |                      |      |        |                        |      |        |
| Pain                    | 0.18                 | 0.09 | 0.05   |                        |      |        |
| Symptom control         | 0.19                 | 0.08 | 0.02   |                        |      |        |
| Terminal care           | -0.16                | 0.27 | 0.55   |                        |      |        |
| Palliative planning     | -                    | -    | -      |                        |      |        |
| Referring service       |                      |      |        |                        |      |        |
| Hematology              | 0.26                 | 0.18 | 0.15   | 0.31                   | 0.17 | 0.08   |
| Medical oncology        | 0.08                 | 0.12 | 0.52   | 0.11                   | 0.12 | 0.36   |
| Other referring service | -0.55                | 0.24 | 0.02   | -0.35                  | 0.23 | 0.12   |
| Psychosocial oncology   | 0.14                 | 0.25 | 0.58   | 0.06                   | 0.25 | 0.82   |
| Radiation oncology      | 0.01                 | 0.14 | 0.95   | 0.04                   | 0.13 | 0.74   |
| Surgical oncology       | -                    | -    | -      | -                      | -    | -      |
| EDS, per 10 points      | 0.16                 | 0.02 | <.0001 | 0.15                   | 0.02 | <.0001 |

## Discussion

- This is the **first study to assess agreement between physician - and patient - rated PS scales** in patients with diverse cancer diagnoses in the **outpatient palliative care setting**.
- Patients tended to report their PS as **worse than physicians**, as found in previous studies in patients with lung and colon cancer.
- Considering this, perhaps it would be worthwhile to discuss performance status with patients and explore reasons for inconsistencies.

## Discussion

- A multivariate regression analysis shows that **patient age and ESAS EDS correlated significantly** with disagreement in performance status estimation in this study.
- This is in particular for **those with greater symptom burden**, which may suggest an influence of **poorer self-perception and expectations** in these patients.
- Similarly, **younger patients** tend to **rate their PS as worse than physicians**, which might be due to physicians overestimating PS of young patients, or due to younger patients assessing their PS more pessimistically.

## Conclusion

- Collecting **both** patient and physician-reported PS could assist in a **more accurate assessment** in eligibility for hospice or home care, along with other treatment or care options.
- Future research will evaluate the **correlation of physician vs. patient PS ratings against survival** data to investigate the clinical significance of **patient reported PS as a prognostication tool**.