

WEIGHT LOSS IN SOLID TUMORS PROGNOSTIC IMPORTANCE

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12/6/2013

INTRODUCTION

- Objectives
 1. Weight Loss (WL) in Adult Solid Tumors
 2. WL: Clinical Predictors
 3. WL, Clinical Predictors, Prognosis

METHODS

- Electronic Medical Record: 2009 – 2011
- Cancer Center Retrospective
- N = 5901: Solid Tumor + 2 Visits + Weight
- Visit 1: ≤ 1 Year After Diagnosis
- Visit 2: ≥ 3 Weeks After Visit 1

METHODS

- % Weight Change Visit 1 → 2 (Continuous)
- 4 Categories
 - Weight Gain
 - WL: $\leq 5\%$
 - WL: 5.01-10%
 - WL: $>10\%$

METHODS

- Clinical Variables
 - Body Mass Index (BMI)
 - Blood Pressure (Systolic, Diastolic)
 - Charlson Comorbidity Index (CCI)
 - C-Reactive Protein (CRP)
 - Pulse Rate
 - Resting Energy Expenditure (REE)

DEMOGRAPHIC DATA (N = 5901)

Variables	%
Mean Age 61±12	
Gender	
Male	58
Female	42
Race	
Caucasian	82
African-American	16
Others	2
Primary Sites	
Genitourinary (GU)	31
Gastrointestinal (GI)	16
Breast	15
Lung	15
Head and Neck	6
Brain	5
Known Metastasis	18

CLINICAL PREDICTORS OF WL

Variables	Odds Ratio	95% CI	p
Primary Site			
GU	1.87	1.45 – 2.40	<0.001
Other	2.41	1.82 – 3.19	<0.001
Lung	2.02	1.53 – 2.66	<0.001
GI	3.92	2.99 – 5.12	<0.001
H&N	8.00	5.75 – 11.1	<0.001
Metastatic Site	1.36	1.24 – 1.49	<0.001
Radiotherapy	1.70	1.48 – 1.96	<0.001
Chemotherapy	1.26	1.06 – 1.50	<0.001
BMI Obese	1.77	1.47 – 2.13	<0.001

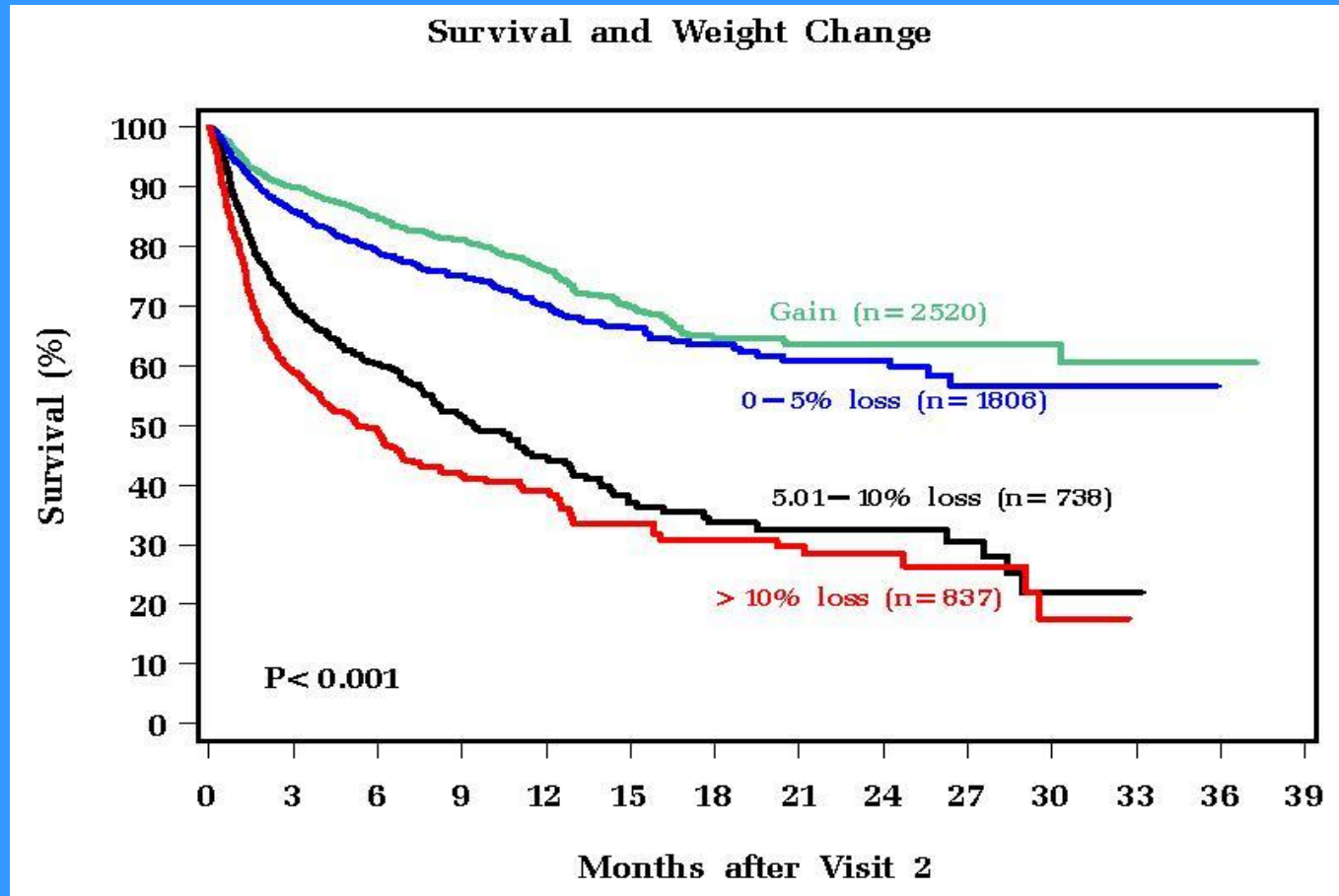
CLINICAL PREDICTORS OF PROGNOSIS IN WL

Variables	Hazard Ratio	95% CI	p
Chemotherapy	1.95	1.60-2.39	<0.001
Tachycardia	1.84	1.50-2.25	<0.001
Metastasis (+1) site	1.58	1.45-1.73	<0.001
WL>10%	1.31	1.03-1.67	0.026
Calculated REE	1.30	1.16-1.46	<0.001

WEIGHT CHANGE AND PROGNOSIS

Months F/U	Gain (n=2520)	5.01 – 10% WL (n=738)	>10% (n=837)	p
6	85	60	49	<0.001
18	65	34	31	
Median	Not observed	9 months	5 months	

WEIGHT LOSS AND PROGNOSIS



CONCLUSIONS

1. New Diagnosis > Half > 5% WL V1-V2
2. Weight & BMI: Unreliable → Use WL
3. WL Predictors
 - Cancer Site
 - Metastatic Sites
 - Treatment
4. Physician Underreported WL (97%)
5. ↓ Systolic BP & ↑ Pulse: Across WL Severity
6. Prognostic Factors: >10% WL, Tachycardia
7. 43% ↑ Weight

Investigators

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- **Lisa Rybicki, MS**
- **Aynur Aktas, MD**

METHODS

- Univariate Associations
 - Weight + Continuous (Pearson corr.)
 - Weight + Categorical (t-test/ANOVA)
- Multivariate (MVA): Stepwise Linear Regression
- Prognosis: >Visit 2
 - Kaplan Meier + Log Rank
 - Cox Proportional Hazard Analysis

INTRODUCTION

- Large Cancer Database Useful – Weight Loss (WL) Prevalence and Severity
- Predictive & Prognostic Importance in Cancer Outcomes ¹
- Independent Prognostic Parameter ²
- WL in Cancer
 - ? Hypermetabolism (REE)
 - ? Blood Pressure, Pulse, WL Related (Autonomic)

1. Di Fiore F, Am J Gastroenterol, 2007

2. Walsh D, Support Care Cancer, 2000

RESULTS: CHANGE VISIT 1→2

Variable (Median)	Gain (N=2520)	0-5% WL (N=1806)	5.01-10% WL (N=738)	>10% WL (N=837)	P value
Days Visit 1→2	216 (22,1080)	144 (22,1075)	182 (22,1049)	277 (22, 1053)	<0.001
BMI	1 (-4, 13)	-1 (-6, 5)	-2 (-14, 2)	-4 (-19, 0)	<0.001
Systolic BP	0 (-72, 80)	-4 (-99, 78)	-6 (-77, 57)	-9 (-86, 50)	<0.001
Diastolic BP	0 (-41, 47)	-2 (-57, 42)	-2 (-43, 42)	-3 (-47, 47)	<0.001
Calculated REE	27 (-49, 365)	-24 (-109, 55)	-75 (-240, -21)	-156 (-890, -46)	<0.001
Pulse	0 (-84, 62)	-1 (-47, 69)	2 (-59, 76)	6 (-49, 105)	<0.001
Albumin	0 (-2, 5)	0 (-2, 2)	-0.2 (-2, 3)	-0.3 (-3, 2)	<0.001
Triglycerides	10(-102, 234)	-2 (-159, 254)	-12 (-67, 47)	-1 (-89, 253)	0.74
Hemoglobin	0 (7, 8)	-1 (6, 5)	-1 (10, 5)	-1 (9, 5)	<0.001

RESULTS: PREDICTORS AFTER VISIT 1

Variables	Odds Ratio	95% CI	p
Primary Site			
GU/Breast	1.87	1.45 – 2.40	<0.001
Other/Breast	2.41	1.82 – 3.19	<0.001
Lung/Breast	2.02	1.53 – 2.66	<0.001
GI/Breast	3.92	2.99 – 5.12	<0.001
H&N/Breast	8.00	5.75 – 11.1	<0.001
Number of Metastatic Sites Per 1 Site Increase	1.36	1.24 – 1.49	<0.001
Radiotherapy, Yes/No	1.70	1.48 – 1.96	<0.001
Chemotherapy, Yes/No	1.26	1.06 – 1.50	<0.001
BMI			
Overweight/Normal	1.39	1.18 – 1.63	<0.001
Obese I/Normal	1.77	1.47 – 2.13	<0.001
Obese II/Normal	1.76	1.38 – 2.25	<0.001
Obese III/Normal	1.55	1.16 – 2.08	0.003
Days from Visit 1 → Visit 2	0.98	0.97 – 0.99	<0.001

PROGNOSTIC FACTORS AFTER VISIT 2

Variables	Hazard Ratio	95% CI	p
Weight Change			
Visit 1 → Visit 2 >10% / Gain	1.31	1.03-1.67	0.026
Primary Site			
Brain/Breast	3.10	1.73-5.56	<0.001
GI/Breast	2.15	1.38-3.36	<0.001
Lung/Breast	2.24	1.43-3.54	<0.001
Other/Breast	1.74	1.08-2.78	0.022
Metastatic Sites			
Per 1 site increase	1.58	1.45-1.73	<0.001
Chemotherapy			
Yes/No	1.95	1.60-2.39	<0.001
Days from Visit 1 → Visit 2	0.95	0.94-0.97	<0.001
Age at Visit 2, years	1.36	1.23-1.51	<0.001

RESULTS: CHANGE VISIT 1→2

Variable (Median)	0-5% WL (N=1806)	>10% WL (N=837)	P value
Days Visit 1→2	144 (22, 1075)	277(22, 1053)	<0.001
BMI	-1 (-6, 5)	-4 (-19, 0)	<0.001
Systolic BP	-4 (-99, 78)	-9 (-86, 50)	<0.001
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Calculated REE	24(-109, 55)	-156 (-890, -46)	<0.001
Pulse	-1 (-47, 69)	6 (-49, 105)	<0.001
Albumin	0 (-2, 2)	-0.3 (-3, 2)	<0.001
Triglycerides	-2 (-159, 254)	-1 (-89, 253)	0.74
Hemoglobin	-1 (6, 5)	-1 (9, 5)	<0.001

PROGNOSTIC FACTORS AFTER VISIT 2

Variables	Hazard Ratio	95% CI	p
Weight at Visit 2, kg	0.65	0.55-0.77	<0.001
Systolic BP at Visit 2			
Stage I HTN/Normal	0.77	0.60-0.98	0.036
Stage II HTN/Normal	0.51	0.33-0.80	0.003
REE at Visit 2, %	1.30	1.16-1.46	<0.001
Pulse at Visit 2			
Tachycardia/Normal	1.84	1.50-2.25	<0.001
Albumin at Visit 2, g/dL	0.55	0.48-0.64	<0.001
Hematocrit at Visit 2, %	0.84	0.76-0.92	<0.001
WBC at Visit 2, k/ μ L	1.02	1.00-1.04	0.014

PROGNOSTIC FACTORS: VISIT 2

Variables	Hazard Ratio	95% CI	p
Weight, kg	0.65	0.55-0.77	<0.001
Systolic BP			
Stage I HTN/Normal	0.77	0.60-0.98	0.036
Stage II HTN/Normal	0.51	0.33-0.80	0.003
Calculated REE, %	1.30	1.16-1.46	<0.001
Pulse			
Tachycardia/Normal	1.84	1.50-2.25	<0.001
Albumin, g/dL	0.55	0.48-0.64	<0.001
Hematocrit, %	0.84	0.76-0.92	<0.001
WBC, k/uL	1.02	1.00-1.04	0.014

RESULTS: SURVIVAL AFTER VISIT 2

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Three pairwise comparisons were also significant at $p < 0.001$

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Months F/U	Gain (n=2520)	5.01 – 10% WL (n=738)	>10% (n=837)	p
6	85	60	49	<0.001
12	76	44	39	
18	65	34	31	
24	64	33	28	
30	64	22	18	
Median	Not observed	9 months	5 months	
# (%) Dead	388 (15%)	306 (42%)	409 (49%)	

Three pairwise comparisons were also significant at $p < 0.001$