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| **Supplementary Table 1: Participants by treatment type and timing of their Vitamin D measure in relationship to treatment initiation** |
|  |  | **Timing of serum draw in relationship to treatment** |
| **Treatment course** |  | *No Treatment* |  | *Some Chemo and/or Radiation Treatment* |  | *After surgery (<12 weeks after surgery)* |  | *>12 weeks after surgery* |
| Surgery only |  | 27 |  |  |  | 55 |  | 2 |
| Chemotherapy only |  | 15a |  | 24b |  |  |  |  |
| Radiation only |  | 3a |  | 4b |  |  |  |  |
| Chemotherapy then surgery |  | 1a |  |  |  | 2 |  |  |
| Surgery then chemotherapy |  | 1a |  |  |  | 4 |  |  |
| Surgery then radiation |  | 1a |  |  |  |  |  |  |
| Chemotherapy and radiation |  | 17a |  | 61b |  |  |  |  |
| Trimodality (chemotherapy and radiation followed by surgical resection) |  | 37a |  | 137c |  | 67 |  | 12 |
| No Treatment |  | 8 |  |  |  |  |  |  |
| *Totals per category:* |  | 108 |  | 226 |  | 128 |  | 14 |

Values in the table represent number of patients in each category

1. These patients’ bloods were drawn <4 weeks after the date of diagnosis, and we assumed they have not started there chemotherapy and/or radiation yet.
2. These patients’ bloods were drawn >=4weeks after the date of diagnosis, and we assumed they had initiated chemotherapy and/or radiation by that time.
3. These patients’ bloods were drawn >=4weeks after the date of diagnosis but before the date of their surgical resection, and we assume they had initiated chemotherapy and/or radiation.

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| **Supplementary Table 2: Serum levels of 25(OH)D and overall survivala among EA patients who had not undergone treatment**b **at the time of blood draw (N=108)** |
| **25(OH)D Quartiles**c |  | **N deaths/patients** | **Hazard Ratio** | **95% CI** | **p-value** |
| 1 (highest) |  | 26/37 | REF |  |  |
| 2 |  | 22/33 | 0.54 | (0.27, 1.08) | 0.08 |
| 3 |  | 17/21 | 0.84 | (0.39, 1.81) | 0.66 |
| 4 (lowest) |  | 15/17 | 1.07 | (0.48, 2.37) | 0.87 |
|  |   |  |  |  | Global p-value=0.21 |
| **25(OH)D Clinical Cut Pointsd** |  |  |  |  |  |
| ≥40 ng/mL (≥100 nmol/L) |  | 4/5 | REF |  |  |
| 30-40 ng/mL (75-100 nmol/L) |  | 7/9 | 7.97 | (1.39, 45.80) | 0.02 |
| 20-30 ng/mL (50-75 nmol/L) |  | 34/51 | 2.17 | (0.47, 9.90) | 0.32 |
| 10-20 ng/mL (25-50 nmol/L) |  | 29/37 | 2.76 | (0.61, 12.59) | 0.19 |
| <10 ng/mL (<25 nmol/L) |  | 6/6 | 10.38 | (1.46, 74.07) | 0.02 |
|  |  |  |  |  | Global p-value=0.02 |
| **25(OH)D Continuous (ng/mL)**d |  |  | 1.00 | (0.96, 1.03) | 0.75 |

aOverall survival was calculated as time between date of blood draw and date of death or censored at date last known to be alive. b Includes patients who declined treatment, patients who had surgery only and blood was drawn before surgery, and patients whose blood was drawn <4 weeks after diagnosis and are assumed to have not started chemotherapy and/or radiation treatment. cEstimates come from model that additionally adjusted for age, sex, smoking status, BMI categories, year of diagnosis, time between diagnosis and blood draw, chemotherapy, radiation, time-dependent surgery, and baseline hazard was stratified by tumor stage by lymph node status. Quartiles of vitamin D were determined accounting for month of blood draw. dEstimates come from model that additionally adjusted for age, sex, smoking status, BMI categories, season of blood draw, year of diagnosis, time between diagnosis and blood draw, chemotherapy, radiation, time-dependent surgery, and baseline treatment was stratified by tumor stage by lymph node status.

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| **Supplementary Table 3: Estimated 25(OH)D at time of diagnosis and overall survival**a  **among EA patients (N=445)** |
|  |  | **Hazard Ratio** | **95% CI** | **p-value** |
| **Estimated 25(OH)D (ng/mL) at time of diagnosis continuous**b |  | 0.97 | (0.93, 1.02) | 0.30 |  |

aIn this analysis, overall survival was calculated as time between date of pathology confirmed diagnosis and date of death or censored at date last known to be alive. bEstimates come from model that additionally adjusted for age, sex, smoking status, BMI categories, year of diagnosis, chemotherapy, radiation, time-dependent surgery, and baseline hazard was stratified by tumor stage by lymph node status.

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| **Supplementary Table 4: Serum levels of 25(OH)D and overall survivala among White EA patients (N=446)** |
| **25(OH)D Quartiles**b |  | **N deaths/patients** | **Hazard Ratio** | **95% CI** | **p-value** |
| 1 (highest) |  | 85/109 | REF |  |  |
| 2 |  | 77/113 | 0.87 | (0.63, 1.19) | 0.39 |
| 3 |  | 90/117 | 1.03 | (0.76, 1.39) | 0.85 |
| 4 (lowest) |  | 85/107 | 0.99 | (0.72, 1.36) | 0.96 |
|  |   |  |  |  | Global p-value=0.74 |
| **25(OH)D Clinical Cut Pointsc** |  |  |  |  |  |
| ≥40 ng/mL (≥100 nmol/L) |  | 13/15 | REF |  |  |
| 30-40 ng/mL (75-100 nmol/L) |  | 31/39 | 1.38 | (0.71, 2.69) | 0.34 |
| 20-30 ng/mL (50-75 nmol/L) |  | 115/166 | 1.01 | (0.56, 1.83) | 0.98 |
| 10-20 ng/mL (25-50 nmol/L) |  | 150/189 | 1.29 | (0.71, 2.32) | 0.40 |
| <10 ng/mL (<25 nmol/L) |  | 28/37 | 1.04 | (0.52, 2.10) | 0.91 |
|  |  |  |  |  | Global p-value=0.27 |
| **25(OH)D Continuous (ng/mL)**c |  |  | 1.00 | (0.99, 1.01) | 0.48 |

aOverall survival was calculated as time between date of blood draw and date of death or censored at date last known to be alive bEstimates come from model that additionally adjusted for age, sex, smoking status, BMI categories, year of diagnosis, time between diagnosis and blood draw, chemotherapy, radiation, time-dependent surgery, and baseline hazard was stratified by tumor stage by lymph node status. Quartiles of vitamin D were determined accounting for month of blood draw. cEstimates come from model that additionally adjusted for age, sex, smoking status, BMI categories, season of blood draw, year of diagnosis, time between diagnosis and blood draw, chemotherapy, radiation, time-dependent surgery, and baseline treatment was stratified by tumor stage by lymph node status