Appendix A

VHA Prostate Measures

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MEASURE #1: PERFORMANCE STATUS	
Numerator Statement	Patients with documentation of performance status using a standardized scale (i.e. ECOG, WHO, KPS) at consult.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Indication of just "poor" or "good" performance status does NOT meet this measure; must use a standard scale. • Consensus Survey Results: 100%
Expected Performance Rate	• Higher = better • Panel vote: 90%
Timeframe	• At time of consult

MEASURE #2: INITIAL EVALUATION: PSA, T STAGE, GLEASON SCORE, AND RISK GROUP	
Numerator Statement	Patients with documented evaluation in the physician's consult note that includes **ALL** of the following: 1. Prostate-specific antigen (PSA), **AND** 2. Primary tumor (T) stage, **AND** 3. Gleason score, **AND** 4. NCCN risk group
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients treated post prostatectomy
Notes	• Documentation of primary and secondary Gleason grade is acceptable but not required for item #3. • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	Time of consult

MEASURE #3: IMAGING/STAGING FOR HIGH RISK	
Numerator Statement	Patients with imaging for staging, prior to the initiation of treatment, that includes: 1. CT or MRI, **AND** 2. Bone scan (T^{99} or NaF PET).
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, at high **OR** very high risk as defined by NCCN guidelines, receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients treated post prostatectomy
Notes	• Consensus Survey Results: 100%
Expected Performance Rate	• Higher = better • Panel Vote: 95% • CMS PQRS Measure #102 (Avoidance of Overuse of Bone Scan for Staging Low-Risk Prostate Cancer Patients). Average Performance Rate in 2011: 95.4%. in 2012: 92.9%; in 2013: 90.6%
Timeframe	Prior to first treatment

MEASURE #4: DISCUSSION OF TREATMENT OPTIONS FOR INTERMEDIATE RISK	
Numerator Statement	Patients who received counseling on, at a minimum, **ALL** the following treatment options for clinically localized disease prior to initiation of treatment: 1. Interstitial prostate brachytherapy, **AND** 2. External beam radiotherapy, **AND** 3. Radical prostatectomy.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, at intermediate risk as defined by NCCN guidelines, receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Mention of surgery discussion is acceptable for item #3. • If patient was previously seen by a urologist for prostatectomy consult/procedure, item #3 is considered met • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 80%
Timeframe	Prior to the first treatment

ASPIRATIONAL MEASURE #5: QUALITY OF LIFE ASSESSMENT AT CONSULT	
Numerator Statement	Patients with urinary **OR** bowel **OR** sexual **OR** hormonal domains assessed with a validated instrument (i.e. AUA, EPIC-26, IIEF/SHIM) documented in the physician's consult note.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• A validated instruments need to be used (i.e. an internal assessment would not be sufficient). • Aspirational Measure • Consensus Survey Results: 100%
Expected Performance Rate	Higher Score = Better
Timeframe	Time of consult.

SURVEILLANCE MEASURE #6: ENROLLED CLINICAL TRIAL	
Numerator Statement	Patients enrolled in a prospective, oncology clinical trial.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Surveillance measure
Timeframe	Before first treatment

MEASURE #7: USE OF 3D OR IMRT	
Numerator Statement	Patients who receive three-dimensional conformal radiotherapy (3D-CRT) **OR** intensity modulated radiation therapy (IMRT).
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving external beam radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Collect data of IMRT vs. 3D-CRT • Consensus Survey Results: 86%
Expected Performance Rate	Higher = better Panel Vote: 100%
Timeframe	Time of treatment

MEASURE #8: DOSE-VOLUME HISTOGRAM EVALUATION	
Numerator Statement	Patients with dose-volume histogram (DVH) evaluating: 1. PTV, **AND** 2. Bladder, **AND** 3. Rectum.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving external beam radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 95%
Timeframe	Found in the treatment planning directive

MEASURE #9: ANDROGEN DEPRIVATION THERAPY FOR HIGH RISK DISEASE	
Numerator Statement	Patients who receive androgen deprivation therapy (ADT) (gonadotropin-releasing hormone [GnRH] agonist or antagonist]) neoadjuvant to **OR** concurrent with definitive radiation therapy.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, at high **OR** very high risk as defined by NCCN guidelines receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Post prostatectomy patients
Notes	• For post-prostatectomy patients, still collect ADT use • Measure applies to external beam AND brachytherapy patients. • "Concurrent" is defined as within 2 weeks of the start of radiation therapy • Collect duration of ADT • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better CMS PQRS Measure #104 (Adjuvant Hormonal Therapy for High Risk Prostate Cancer Patients). Average Performance Rate in 2011: 95.1%. in 2012: 95.6%; in 2013: 97.9%
Timeframe	Time of treatment

SURVEILLANCE MEASURE #10: ANDROGEN DEPRIVATION THERAPY FOR INTERMEDIATE RISK	
Numerator Statement	Patients who receive androgen deprivation therapy (ADT) (gonadotropin-releasing hormone [GnRH] agonist or antagonist]) a neoadjuvant to **OR** concurrent with definitive radiation therapy.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, at intermediate risk as defined by NCCN guidelines receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Post prostatectomy patients
Notes	• For post-prostatectomy patients, still collect ADT use • Measure applies to external beam AND brachytherapy patients. • "Concurrent" is defined as within 2 weeks of the start of radiation therapy • Collect duration of ADT • Consensus Survey Results: 57%
Expected Performance Rate	Surveillance measure
Timeframe	Time of treatment

MEASURE #11: DAILY TARGET LOCALIZATION	
Numerator Statement	Patients treated using **ONE** of the following daily target localization method: 1. Cone beam CT, **OR** 2. Fiducial markers with cone beam CT, **OR** 3. Fiducial markers with portal imaging, **OR** 4. Electromagnetic transponder, **OR** 5. Ultrasound (transabdominal or transperineal)
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, receiving external beam radiation therapy alone
DENOMINATOR EXCLUSIONS/ EXCEPTIONS	• Post prostatectomy patients
Notes	• Option #3 (Fiducial markers with portal imaging) includes orthogonal/stereoscopic KV-KV or KV-MV imaging • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	Time of treatment

SURVEILLANCE MEASURE #12: COMPREHENSIVE TREATMENT FOR HIGH RISK	
Numerator Statement	Patients receiving whole pelvis radiation that includes pelvic lymph nodes.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, at high **OR** very high risk as defined by NCCN guidelines receiving external beam radiation therapy.
DENOMINATOR EXCLUSIONS/ EXCEPTIONS	• Post prostatectomy patients
Notes	• Consensus Survey Results: 57%
Expected Performance Rate	Surveillance measure
Timeframe	Found in the prescription

MEASURE #13: IMMOBILIZATION	
Numerator Statement	Patients who are appropriately immobilized with **ONE** of the following methods: (1) Body Mold, **OR** (2) Leg Fixation
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, receiving external beam radiation therapy
DENOMINATOR EXCLUSIONS/ EXCEPTIONS	• Patients who have electromagnetic transponders
Notes	• Consensus Survey Results: 71%
Expected Performance Rate	Higher = better
Timeframe	Found in the simulation note or treatment directive

MEASURE #14: DOSE FOR CONVENTIONAL FRACTIONATION SCHEME	
Numerator Statement	Patients receiving dose levels ≥ 7400 cGy (or CGE) at 180 -200 cGy/fraction
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving external beam radiation therapy only
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Post-prostatectomy patients • Patients treated for recurrent/metastatic disease • Patients treated with hypofractionation regime (including SBRT); • Patients on clinical trials
Notes	• Collect both dose and fractionation schedule for hypofractionated patients. • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel vote: 95%
Timeframe	Found in prescription

MEASURE #15: APPROPRIATE DOSE FOR POST-PROSTATECTOMY	
Numerator Statement	Patients receiving dose levels ≥ 6000 cGy but ≤ 7200 cGy (or CGE) at 180-200 cGy/fraction.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving external beam radiation therapy after a prostatectomy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients on a clinical trial • Patients with gross disease

Notes	• Collect the prescribed dose
	• Report dose in 3 levels:
	  ○ Red < 6000 cGy OR >7200 cGy
	  ○ Yellow ≥ 6000 ≤ 6400 cGy
	  ○ Green > 6400 ≤ 7200 cGy
	• Consensus Survey Results: 100%

Expected Performance Rate	Higher = better Panel Vote: Very high
Timeframe	Time of treatment

ASPIRATIONAL MEASURE #16: SURVIVORSHIP CARE PLAN	
Numerator Statement	Patients who have a survivorship care plan* that was communicated to the patient within 30 days of completing treatment.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, receiving radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients receiving palliative care
Notes	• *Survivorship Care Plan is defined as a report that includes mention of ALL of the following components: 1) dose delivered, AND 2) relevant assessment of tolerance to and progress towards the treatment goals, AND 3) follow-up care • ASTRO has NQF measure about Treatment summary measure: http://www.qualityforum.org/QPS/0381 • ASTRO has published a general survivorship care plan: http://www.practicalradonc.org/article/S1879-8500%2815%2900369-0/pdf (http://www.ncbi.nlm.nih.gov/pubmed/26778795) • Aspirational Measure • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better
Timeframe	At time of first follow-up

MEASURE #17A: POST-IMPLANT DOSIMETRIC EVALUATION	
Numerator Statement	Patients who had a complete postoperative dosimetry assessment comprised of **ALL** of the following: 1. CT **OR** MRI imaging, **AND** 2. Prostate V100 evaluation, **AND** 3. Prostate D90 evaluation, **AND** 4. Rectum V100 evaluation, **AND** 5. Physician review
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, receiving low-dose rate, permanent brachytherapy (LDR)
DENOMINATOR EXCLUSIONS/ EXCEPTIONS	
Notes	• Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 100%
Timeframe	At time of first follow-up

MEASURE #17B: TIMING OF POST-IMPLANT DOSIMETRY WITHIN 60 DAYS	
Numerator Statement	Patients who had dosimetry assessment within 60 days of the implant.
DENOMINATOR STATEMENT	Patients who had complete dosimetry assessment (See measure 17A).
DENOMINATOR EXCLUSIONS/ EXCEPTIONS	
Notes	• Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	At time of first follow-up

MEASURE #18: FOLLOW-UP INTERVALS	
Numerator Statement	Patients with follow-up(s) every 6 month for the first 5 years with documentation of disease status.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer, receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	

Comments	• Compliance includes within (+/-) 2 month.
	• Collect patient status (alive or dead) and date of death.
	• Continue collecting patient information up to 5 years.
	• Disease status:
	  ○ No progression
	  ○ Biochemical failure
	  ○ Local/regional progression
	  ○ Metastatic/distant progression
	• Consensus Survey Results: 100%

Expected Performance Rate	Higher = better Panel Vote: 70%
Timeframe	Time of follow-ups (for 5 years)

ASPIRATIONAL MEASURE #19: QUALITY OF LIFE ASSESSMENT AT FOLLOW-UP	
Numerator Statement	Patients with urinary **OR** bowel **OR** sexual **OR** hormonal domains assessed with a validated instrument (i.e. AUA, EPIC-26, IIEF/SHIM) at every routine follow-up.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• A validated instrument needs to be used (i.e. an internal assessment would not be sufficient). • Aspirational Measure • Consensus Survey Results: 86%
Expected Performance Rate	Higher Score = Better.
Timeframe	Follow-up(s) up to 5 years

ASPIRATIONAL MEASURE #20: ACUTE GU TOXICITY GRADE	
Numerator Statement	Patients with an assigned Grade for **acute GU** toxicities experienced while on-treatment **AND** within 90 days after treatment completion documented in medical record
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• CTCAE Toxicity Grade (0-5). Documentation of no toxicity (grade 0) is required. • Grade is required on each OTV (on treatment note) **AND** first follow-up note. • Aspirational Measure • Consensus Survey Results: 86%
Expected Performance Rate	Higher score= better
Timeframe	At time of first follow-up

ASPIRATIONAL MEASURE #21: ACUTE GI TOXICITY GRADE	
Numerator Statement	Patients with an assigned Grade for **acute GI** toxicities experienced while on-treatment **AND** within 90 days after treatment completion documented in medical record
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• CTCAE Toxicity Grade (0-5). Documentation of no toxicity (grade 0) is required. • Grade is required on each OTV (on treatment note) **AND** first follow-up note. • Aspirational Measure • Consensus Survey Results: 86%
Expected Performance Rate	Higher score= better
Timeframe	At time of first follow-up

ASPIRATIONAL MEASURE #22: LATE GI TOXICITY GRADE	
Numerator Statement	Patients with an assigned Grade for **late GI** toxicities documented at routine follow-up(s) 90 days after treatment completion.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• CTCAE Toxicity Grade (0-5). Documentation of no toxicity (grade 0) is required. • Grade is required on all routine follow-up(s). • Aspirational Measure • Consensus Survey Results: 86%
Expected Performance Rate	Higher score= better
Timeframe	At time of first follow-up

ASPIRATIONAL MEASURE #23: LATE GU TOXICITY GRADE	
Numerator Statement	Patients with an assigned Grade for **late GU** toxicities documented at routine follow-up(s) 90 days after treatment completion
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• CTCAE Toxicity Grade (0-5). Documentation of no toxicity (grade 0) is required. • Grade is required on all follow-up note(s). • Aspirational Measure • Consensus Survey Results: 86%
Expected Performance Rate	Higher score= better
Timeframe	At time of first follow-up

ASPIRATIONAL MEASURE #24: BASELINE BONE HEALTH ASSESSMENT	
Numerator Statement	Patients who have a bone density assessment within 3 months of the start of hormonal therapy.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving long term (more than 12 months) of androgen deprivation therapy (ADT) (gonadotropin-releasing hormone [GnRH] agonist or antagonist])
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• "within 3 months of start" = 3 months before or 3 months after initating hormonal therapy. • Aspirational Measure • Consensus Survey Results: 86%
Expected Performance Rate	Higher = better
Timeframe	3 months before or after the start of hormonal therapy.

ASPIRATIONAL MEASURE #X: TREATMENT VOLUMES FOR POST-PROSTATECTOMY	
Numerator Statement	Patients receiving treatment volumes consistent with RTOG consensus atlas
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of prostate cancer receiving external beam radiation therapy after a prostatectomy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• March 31: This is not feasible to collect but would be a great research project. May also be used for definitive patients. May be useful to record numerical volumes of respective organs outside a standard deviation. • Aspirational Measure
Expected Performance Rate	This measure will not be tracked at this time.
Timeframe	Time of treatment

Appendix B

VHA Lung Measures

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MEASURE #1: PRE-TREATMENT WORKUP: BRAIN MRI OR CT, AND PET-CT	
Numerator Statement	Patients with imaging for staging, prior to the initiation of treatment, that includes: 1. brain MRI or CT scan, **AND** 2. PET-CT.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 86%
Expected Performance Rate	Higher = better Panel Vote: 95%
Timeframe	Prior to treatment

MEASURE #2: ASSESSMENT OF HISTOLOGICAL OR CYTOLOGICAL TYPE	
Numerator Statement	Patients with histological **OR** cytological assessment reviewed by the radiation oncologist at consult.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients with medical comorbidities • Patients too frail to undergo assessment
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 95%
Timeframe	At time of consult

MEASURE #3: SQUAMOUS OR NON-SQUAMOUS NSCLC DOCUMENTATION	
Numerator Statement	Patients with documentation of squamous vs. non-squamous classification at consult.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of non-small cell lung cancer (NSCLC)
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients with medical comorbidities • Patients too frail to undergo assessment
Notes	Consensus Survey Results: 86%
Expected Performance Rate	Higher = better Panel Vote: 80%
Timeframe	At time of consult

SURVEILLANCE MEASURE #4: COLLECTION OF MOLECULAR INFORMATION	
Numerator Statement	Patients with collection of *EFGR* **OR** *ALK* molecular information prior to the initiation of treatment.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients with medical comorbidities • Patients too frail to undergo assessment
Notes	• Aspirational Measure • Collect data regarding EFGR vs. ALK • Consensus Survey Results: 57%
Expected Performance Rate	Surveillance Measure
Timeframe	At time of consult

MEASURE #5: CLINICAL STAGE	
Numerator Statement	Patients with documentation of clinical stage at consult (1) Using a standardized method (i.e. AJCC, IASLC, UICC) for non-small cell lung cancer (NSCLC) **OR** (2) Limited or extensive stage for small cell lung cancer (SCLC).
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	At time of consult

MEASURE #6: MULTIDISCIPLINARY CONSULT	
Numerator Statement	Patients with multidisciplinary care consult prior to the start of radiation therapy, accounted by: (1) Discussion at multidisciplinary tumor board **OR** (2) Consult with at least **ONE** of the following disciplines: 1. Surgical Oncology 2. Medical Oncology 3. Pulmonology
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Higher = better
Timeframe	Before first treatment

MEASURE #7: PERFORMANCE STATUS	
Numerator Statement	Patients with documentation of performance status using a standardized scale (i.e. ECOG, WHO, KPS) at consult.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Indication of just "poor" or "good" performance status does NOT meet this measure; must use a standard scale. • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	At time of consult

MEASURE #8A: SMOKING STATUS	
Numerator Statement	Patients with a documentation of current smoking status at the time of consult.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	At time of consult

MEASURE #8B: SMOKING CESSATION REFERRAL/COUNSELING	
Numerator Statement	Patients with a referral to a smoking cessation program **OR** documentation of smoking cessation counseling.
DENOMINATOR STATEMENT	Patients identified as a current smoker at the time of consult. (See Measure #8A)
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 86%
Expected Performance Rate	Higher = better Panel Vote: 80%
Timeframe	At time of consult

SURVEILLANCE MEASURE #9: ENROLLED CLINICAL TRIAL	
Numerator Statement	Patients enrolled in a prospective, oncology clinical trial.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Aspirational Measure • Consensus Survey Results: 71%
Expected Performance Rate	Surveillance Measure
Timeframe	Before first treatment

MEASURE #10: IMPLANTABLE CARDIAC DEVICE SCREENING	
Numerator Statement	Patients screened for an implantable cardiac device prior to or during simulation.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 86%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	Prior to or during simulation

MEASURE #11: USE OF 3D OR IMRT	
Numerator Statement	Patients who receive three-dimensional conformal radiotherapy (3D-CRT) **OR** intensity modulated radiation therapy (IMRT).
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of stage III non-small cell lung cancer (NSCLC) **OR** limited stage small cell lung cancer (SCLC) receiving external beam radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Collect data of IMRT vs. 3D-CRT • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better
Timeframe	At time of first treatment

MEASURE #12: CONTOURING OF OARS	
Numerator Statement	Patients with use of dose-volume histogram (DVH) evaluating the lung **AND** at least **TWO** of the following organs at risk (OARs): (1) Spinal Cord (2) Esophagus (3) Heart
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer, receiving three-dimensional conformal radiotherapy (3D-CRT) **OR** intensity modulated radiation therapy (IMRT).
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Higher = better
Timeframe	At time of first treatment

MEASURE #13: HETEROGENEITY PLANNING ALGORITHM	
Numerator Statement	Patients with documentation of acceptable heterogeneity planning algorithm by **ONE** of the following mechanisms: (1) Convolution Type (2) Monte Carlo (3) Grid Boltzman Solver (GBS)
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	

Notes	• The following are **NOT** acceptable algorithms:
	  ○ Pencil beam
	  ○ Clarkson
	• Helpful to see variation across facilities; not patient-specific.
	• Consensus Survey Results: 86%

Expected Performance Rate	Higher = better
Timeframe	Documentation in the plan print-out and treatment planning system; During planning

MEASURE #14: MOTION MANAGEMENT	
Numerator Statement	Patients with motion management accounted by: (1) ITV is created to include motion of the GTV (iGTV) or CTV (iCTV), **OR** (2) **ONE** of the following with specified margins: (1) Abdominal compression (2) Active breath hold (3) Free-breathing gating (4) Gated breath-hold
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer receiving external beam radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	Prior to treatment. Located in the simulation note.

ASPIRATIONAL MEASURE #15: 28 DAYS FROM DIAGNOSIS TO FIRST TREATMENT	
Numerator Statement	Patients with pathologically confirmed diagnosis who started any treatment (radiation, chemotherapy, **OR** surgery) within 28 days.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Aspirational Measure • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 75-80%
Timeframe	At time of first treatment

ASPIRATIONAL MEASURE #16: 21 DAYS FROM CONSULT TO FIRST RADIATION TREATMENT	
Numerator Statement	Patients who started radiation treatment within 21 days after consult with a radiation oncologist.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer receiving radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Aspirational Measure. • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	At time of first treatment

ASPIRATIONAL MEASURE #17: 14 DAYS FROM SIMULATION TO FIRST TREATMENT	
Numerator Statement	Patients who started radiation treatment within 14 days after simulation.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer receiving radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Aspirational Measure • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 90%
Timeframe	At time of first treatment

MEASURE #18: CONCURRENT CHEMO AND RADIATION THERAPY	
Numerator Statement	Patients receiving concurrent chemotherapy and radiation therapy.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of stage III non-small cell lung cancer (NSCLC) **OR** small cell lung cancer (SCLC) receiving radiation therapy

DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients with low performance status defined as:
	  ○ ECOG grade of 2 or higher
	  ○ WHO grade of 2 or higher
	  ○ KPS grade of 60 or lower

Notes	• Concurrent is defined as any overlap during the course of radiation therapy **OR** up to one week (7 days) prior to the start of RT. • There may be other medical reasons (such as weight loss) which imped patients receiving concurrent chemo radiation therefore 100% performance rate is not expected. • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better Panel Vote: 70%
Timeframe	At time of first follow-up.

MEASURE #19: APPROPRIATE DOSE FOR NSCLC	
Numerator Statement	Patients prescribed a dose to 95% of the PTV of 1. ≥ 5900 cGy **AND** 2. when prescribed concurrent chemotherapy, ≤ 7000 cGy.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of stage III non-small cell lung cancer (NSCLC), receiving conventionally fractionated radiation therapy (180-200 cGy per fraction).
DENOMINATOR EXCLUSIONS/EXCEPTIONS	Patients on Clinical Trials
Notes	• For RT-alone patients, report above 7400 cGy as yellow and above 8400 cGy is red. Do not score the upper dose. • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better
Timeframe	At time of first treatment

MEASURE #20: APPROPRIATE DOSE FOR SCLC	
Numerator Statement	Patients prescribed a dose to 95% of the PTV of (1) ≥ 4500 cGy (150 cGy) twice-a-day (BID) **OR** (2) ≥ 5400 cGy but ≤ 7000 cGy (180 - 200 cGy) once-a-day (QD)
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of limited stage small cell lung cancer (SCLC), receiving concurrent chemo-radiation.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	Patients on Clinical Trials
Notes	• Compliance with this measure is defined as within (+/-) 10% of the prescription • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better
Timeframe	At time of first treatment

MEASURE #21A: PCI FOR SCLC	
Numerator Statement	Patients receiving PCI (prophylactic cranial irradiation) within 60 days after the last treatment of chemotherapy **OR** radiation therapy.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of limited stage small cell lung cancer (SCLC) receiving radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Consensus Survey Results: 100% • Performance Rate is not expected to be 100% due to patient preference to avoid PCI.
Expected Performance Rate	Panel Vote: 70-80%
Timeframe	First Follow-Up

MEASURE #21B: APPROPRIATE DOSE FOR PCI	
Numerator Statement	Patients prescribed 2500 cGy / 10 fractions **OR** 3000 cGy / 15 fractions.
DENOMINATOR STATEMENT	All patients receiving PCI (prophylactic cranial irradiation) (See Measure 21A).
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Higher = better
Timeframe	First Follow-Up

ASPIRATIONAL MEASURE #22: QUALITY OF LIFE ASSESSMENT PRIOR TO TREATMENT COMPLETION	
Numerator Statement	Patients with quality of life assessed with a validated instrument (i.e. LCSS, FACT, EORTC QOL, etc.) prior to the completion of treatment.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer, receiving radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Only report on data prospectively • Pain scale would NOT count as a validated quality of life instrument. • Aspirational Measure • Consensus Survey Results: 86%
Expected Performance Rate	Higher = better
Timeframe	Prior to the completion of treatment

ASPIRATIONAL MEASURE #23: SURVIVORSHIP CARE PLAN	
Numerator Statement	Patients who have a survivorship care plan* that was communicated to the patient within 30 days of completing treatment.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer, receiving radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	• Patients receiving palliative care
Notes	• *Survivorship Care Plan is defined as a report that includes mention of all of the following components: 1) dose delivered, **AND** 2) relevant assessment of tolerance to and progress towards the treatment goals, **AND** 3) follow-up care • ASTRO has NQF measure about Txt summary measure: http://www.qualityforum.org/QPS/0381 • ASTRO has published a general survivorship care plan: http://www.practicalradonc.org/article/S1879-8500%2815%2900369-0/pdf (http://www.ncbi.nlm.nih.gov/pubmed/26778795) • Aspirational Measure • Consensus Survey Results: 86%
Expected Performance Rate	Higher = better
Timeframe	At time of first follow-up

MEASURE #24: FOLLOW-UP INTERVALS	
Numerator Statement	Patients with an initial follow-up at 3 months **AND** additional follow-ups every 6 months with documentation of disease status as **ONE** of the following: (1) No progression (2) Local/regional progression (3) Metastatic/distant progression
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer, receiving radiation therapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• Compliance includes within (+/-) 2 months. • Collect patient status (alive or dead) and date of death. • Continue collecting patient information up to 5 years. • Consensus Survey Results: 100%
Expected Performance Rate	Higher = better
Timeframe	At time of follow-up(s) for 5 years

MEASURE #25: AVOIDANCE OF GRADE 3 PNEUMONITIS TOXICITY	
Numerator Statement	Patients with grade 3 pneumonitis treatment-related toxicity occurring after completion of treatment or persisting within 12 months from treatment start date
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer, receiving radiation therapy.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Lower score = better Higher than 15% = yellow Higher than 20% = red
Timeframe	At time of follow-up (within 1 year)

MEASURE #26: AVOIDANCE OF GRADE 3 ESOPHAGITIS TOXICITY	
Numerator Statement	Patients with grade 3 esophagitis treatment-related toxicity occurring during **OR** within 90 days after completion.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer, receiving radiation therapy with concurrent chemotherapy
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	Consensus Survey Results: 100%
Expected Performance Rate	Lower score = better 20 – 24% = yellow 25% or higher = red
Timeframe	At time of first follow-up

MEASURE #27: GRADE 4 OR 5 TOXICITY DISCUSSED AT M&M	
Numerator Statement	Patient case presented at an M&M conference within 30 days.
DENOMINATOR STATEMENT	All patients, regardless of age, with a diagnosis of lung cancer, receiving radiation therapy with documented grade 4 **OR** grade 5 treatment-related toxicity occurring within 30 days of treatment completion.
DENOMINATOR EXCLUSIONS/EXCEPTIONS	
Notes	• "treatment-related toxicity" focuses on non-hematologic toxicity. • Consensus Survey Results: 100%
Expected Performance Rate	Higher score = better
Timeframe	At time of follow-up (within 1 year)

Appendix C
VHA Prostate DVH Metrics

OAR	Metric	Limit	Green	Yellow	Red
Rectum	V70 Gy	25%	<=25%		>25%
Rectum	V69 Gy	25%	<=25%		>25%
Rectum	V70 Gy	15%	<=15%		>15%
Rectum	V75 Gy	10%	<=10%		>10%
Rectum	V50 Gy	50%	<=50%		>50%
Rectum (postop)	V65 Gy	25%	<=25%		>25%
Rectum (postop)	V40 Gy	45%	<=45%		>45%
Bladder	V70 Gy	35%	<=35%		>35%
Bladder	V65 Gy	50%	<=50%		>50%
Bladder-CTV (postop)	V65 Gy	40%	<=40%	>40% <=60%	>60%
Bladder-CTV (postop)	V40 Gy	60%	<=40%	>40% <=60%	>60%
Femurs	V50 Gy	10%	<=10%		>10%
Small Bowel	V45 Gy	200 cc	<=200 cc		>200 cc
Small Bowel	Dmax	50 Gy			>50 Gy
Large Bowel	Dmax	60 Gy			>60 Gy
PTV coverage	V100	100% Rx	>=95%	>= 90% <95%	<90%
PTV Heterogeneity	D2%	<=2% PTV	<=110% Rx	>110% <=115% Rx	>115% Rx

Appendix D
VHA Lung DVH Metrics

OAR	Metric	Limit	Green	Yellow	Red
Spinal Cord	Dmax*	50 Gy	<= 45 Gy	>45 Gy <= 50 Gy	> 50 Gy
Spinal Cord	Dmax*	41 Gy	<=36.9 Gy	>36.9 Gy <= 41 Gy	> 41 Gy
Spinal Cord	Dmax*	37 Gy	<=33.3 Gy	>33.3 Gy <= 37 Gy	> 37 Gy
Spinal Cord	Dmax*	42 Gy	<= 37.8 Gy	>37.8 Gy <= 42 Gy	> 42 Gy
Brachial Plexus	Dmax*	66 Gy	<= 59.4 Gy	> 59.4 Gy <= 66 Gy	> 66 Gy
Lung	V20 Gy	37%	<= 33%	> 33% <= 37%	> 37%
Lung	V5 Gy	60%	<= 54%	> 54% <= 60%	> 60%
Lung	Dmean	20 Gy	<= 18 Gy	> 18 Gy <= 20 Gy	> 20 Gy
Lung	V20 Gy	7%	<= 6.3%	> 6.3% <= 7%	> 7%
Lung	V5 Gy	60%	<= 54%	> 54% <= 60%	> 60%
Lung	Dmean	8.5 Gy	<= 7.7 Gy	> 7.7 Gy <= 8.5 Gy	> 8.5 Gy
Esophagus	V60 Gy	17%	<= 15.3 %	> 15.3% <= 17 %	> 17%
Esophagus	Dmean	34 Gy	<= 30.6 Gy	> 30.6 Gy <= 34 Gy	> 34 Gy
Esophagus	Dmax*	74 Gy	<= 66.6 Gy	> 66.6 Gy <= 74 Gy	> 74 Gy
Heart	V45Gy	35%	<= 31.5%	> 31.5% <= 35%	> 35 %
PTV	D95%	100% Rx	100%	>= 95% < 100%	< 95%
PTV	Dmin*	85% Rx	>85%	>= 75% < 85%	< 75%