



UNC Lineberger Cancer Network
RESEARCH TO PRACTICE Live Webinar
 August 24, 2022

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<p>PATIENT CENTERED CARE 2nd Wednesday 12 pm - 1 pm NCPD/CNE ACPE ASRT CTR</p>	<p>ADVANCED PRACTICE PROVIDER 3rd Wednesday 4 pm - 5 pm NCPD/CNE</p>
<p>RESEARCH TO PRACTICE 4th Wednesday 12 pm - 1 pm NCPD/CNE CME CTR ACPE ASRT</p>	<p>SOUTHEASTERN AMERICAN INDIAN CANCER HEALTH EQUITY PARTNERSHIP 1st Wednesday - February, May and November 12 pm - 1 pm NCPD/CNE CME</p>

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UNC Lineberger Cancer Network
RESEARCH TO PRACTICE
August 24, 2022

**Advanced Technologies in Radiation Oncology:
Impact on our Day-to-Day Practice**




Arthur Blackstock, Jr., MD



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OUR PRESENTER



A. William Blackstock, Jr., MD

A. William Blackstock, MD, is Professor and Chairman of the Department of Radiation Oncology at the Wake Forest University (WFU) School of Medicine in Winston-Salem, NC. He is a national and international expert in the radiotherapeutic management of gastrointestinal cancers.

After 1 year on faculty at the UNC, Dr. Blackstock accepted an assistant professor position at the WFU School of Medicine – in 1996.

He has been the principal investigator (PI) or co-PI of numerous clinical trials in lung cancer and malignancies of the gastrointestinal tract. He serves on the editorial boards for numerous prestigious journals and currently serves on the NCI Board of Scientific Council – Intramural Program.

Dr. Blackstock serves as co-chair of the NCI Thoracic Malignancy Steering Committee and remains active serving on the NCI designated Pancreatic Task Force. Dr. Blackstock is also Director of the Clinical Research Program at the NCI-designated Comprehensive Cancer Center at Wake Forest University.

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DISCLOSURES


This activity has been planned and implemented under the sole supervision of the Course Director, William A. Wood, MD, MEd, in association with the UNC Office of Continuing Professional Development (CPD). The course director and CPD staff have no relevant financial relationships with ineligible companies as defined by the ACCME.

The University of North Carolina at Chapel Hill is accredited with distinction as a provider of nursing continuing professional development by the American Nurses Credentialing Center's Commission on Accreditation.

A potential conflict of interest occurs when an individual has an opportunity to affect educational content about health-care products or services of a commercial interest with which he/she has a financial relationship. The speakers and planners of this learning activity have not disclosed any relevant financial relationships with any commercial interests pertaining to this activity.

The presenter has no relevant financial relationships with ineligible companies as defined by the ACCME.



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Advanced Technology in Radiation Oncology

A. William Blackstock, MD

Professor and Chair
Department of Radiation Oncology
Interim Director
Wake Forest University Comprehensive Cancer Center


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Advanced Technology in Radiation Oncology
Proton Therapy

Definitive
Pure curative
Durable local control

Adjuvant
Based on the statistical probability of recurrence after surgery

“Palliation”



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Proton Therapy

Teletherapy (external beam)
Photon (X-ray) Radiotherapy
Co-60 sources
Linear accelerator

Particle Therapy
Proton Therapy
Carbon Ion Therapy

3D Conformal
Intensity Modulated Radiotherapy (IMRT)
Volumetric Modulated Arc Therapy (VMAT)
Stereotactic Radiosurgery (SRS)
Stereotactic Body Radiotherapy (SBRT / SABR)

Brachytherapy (implanted radioactive sources)
Low Dose Rate
High Dose Rate
Intraoperative Radiotherapy




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Levine Cancer Center/Wake Forest Comprehensive Cancer Protons

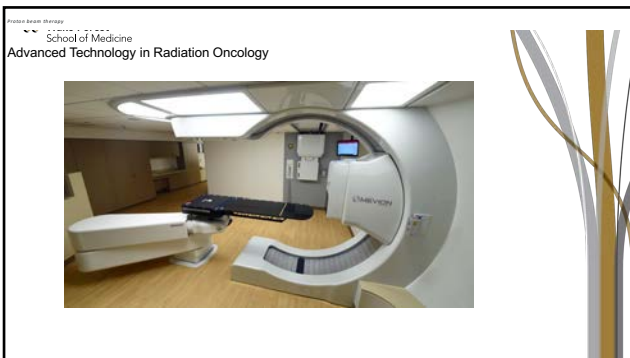
- 2 vault facility
- Mevion Equipment
- Opens in 2024
- Midtown Charlotte
- Intensity Modulated Proton Therapy
- In-room Image Guided Therapy (Cone Beam, KV)
- Dedicated pediatric nursing care



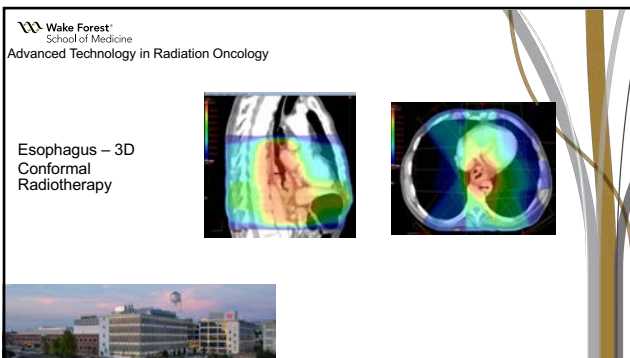
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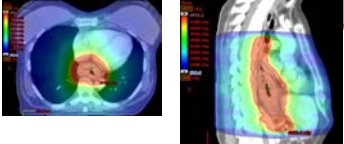
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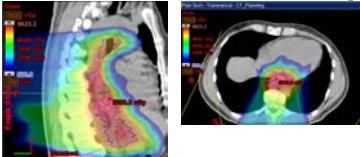
Esophagus – VMAT
IMRT



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Esophagus - Proton



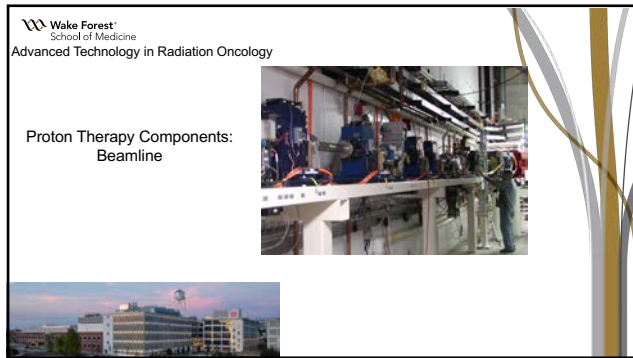
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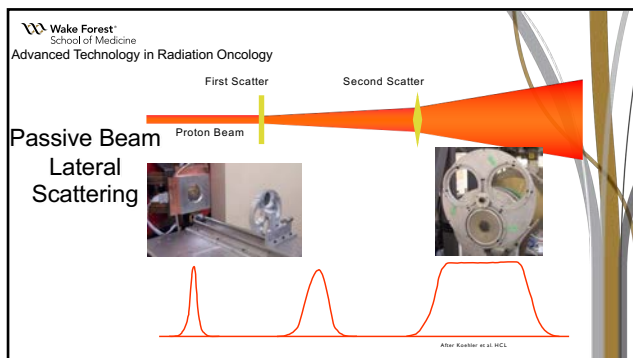
Cyclotron



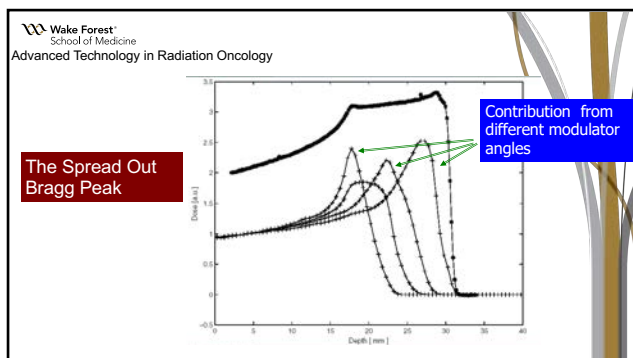
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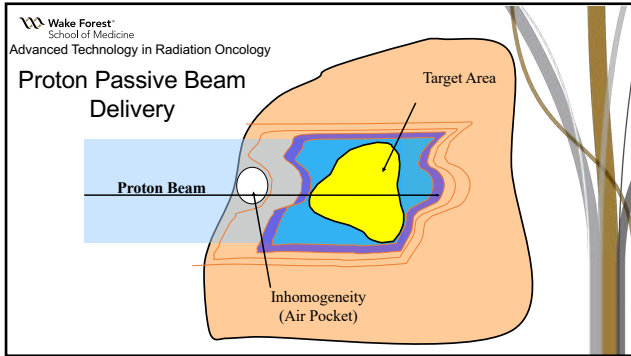
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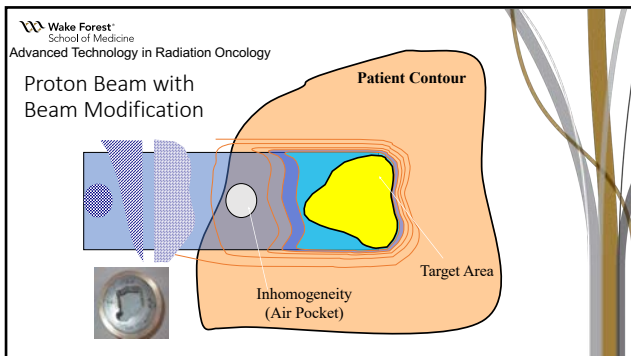
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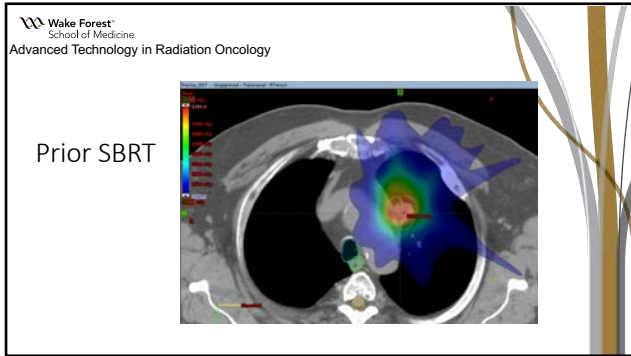
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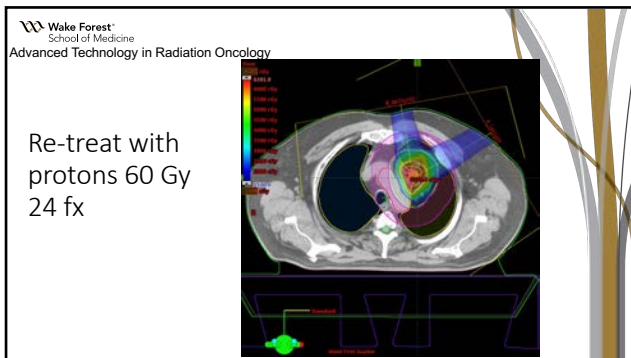
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	Dose	Mean lung		Lung V5		Lung V20				
		3D	IMRT	3D	IMRT	3D	IMRT			
Chang	74 Gy	25 Gy	24 Gy	20 Gy	58%	62%	40%	40%	37%	32%
Nichols	74 Gy	21 Gy	15 Gy	11 Gy	54%	50%	32%	27%	27%	21%
Nichols ENI	74/40	20 Gy	16 Gy	13 Gy	53%	51%	31%	30%	26%	24%
Zhang	74 Gy	NA	20 Gy	15 Gy	NA	59%	39%	NA	35%	28%
Vogelius	60 Gy	12 Gy	10 Gy	5 Gy	NA	NA	NA	22%	14%	10%

Passive scatter PT IMPT			
DS Protons reduced	Mean Lung	Lung V5	Lung V20
3DCRT	7 Gy	20%	7%
IMRT	4 Gy	20%	5%

Chang et al IROBP 2006
 Nichols et al Clinical Lung Cancer 2011
 Zhang et al IROBP 2010
 Vogelius et al Acta Oncologica 2011

Dosimetric Differences Protons vs X-Rays

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RTOG 1308
Phase III Randomized Trial Comparing Overall Survival After Photon Versus Proton
Chemoradiotherapy for Inoperable Stage II-IIIb NSCLC

SCHEMA

Stage	R	Both Arms:
1. II	A	Consolidation
2. IIIA	N	chemotherapy x 2
3. IIIB	D	cycles required for
S	A	patients who
T	N	receive concurrent
R	D	carboplatin and
A	O	paclitaxel***
Histology	M	
1. Squamous	A	Arm 1: Photon dose—70 Gy*(RBE), at 2 Gy
2. Non-Squamous	I	(RBE) once daily plus platinum-based doublet
F	Z	chemotherapy**
Y	E	Arm 2: Proton dose—70 Gy (RBE), at 2 Gy
Concurrent		(RBE) once daily plus platinum-based doublet
Chemotherapy		chemotherapy**
Doublet Type		
1. Carboplatin/paclitaxel		
2. Cisplatin/etoposide		

*The total prescribed dose will be 70 Gy [Relative Biological Effectiveness (RBE)] without exceeding tolerance dose-volume limits of all critical normal structures. (See Section 6.1.3 when 70 Gy (RBE))

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Phase 3 – requiring 560 patients
Primary Endpoint: Overall survival improvement
(21 months IMRT vs. 28 months with Proton)

Each arm to receive 70 Gy
Allow for de-escalation to achieve constraints

Hypothesis: planned reduction in toxicity will result in increased survival

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255 patients enrolled

MDACC – MGH
Randomized Phase II

92 – IMRT	
57 – 3DPT	
106 – non-randomized IMRT	
36 – non-randomized 3DPT	

TF rates @ 12 months

15.6% IMRT;	7.2% RP
24.6% 3DPT;	11.0%RP

In non-randomized groups – TF was no different

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Journal of Clinical Oncology - September 21, 2016
PMID: [18443346](#)

Protons and Parachutes

Joel E. Tepper
Department of Radiation Oncology,
UNC Lineberger Comprehensive Cancer Center
University of North Carolina School of Medicine, Chapel Hill, NC

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- **Oligometastatic Radiation Therapy**
- **Lutetium-177 PSMA therapy**
uses a molecule which attaches itself to the PSMA receptors on the cancer cells. Before it's given to you, the PSMA molecule is bound with lutetium-177. This is a radioactive substance that damages and destroys the prostate cancer cells in a targeted way.

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It always seems like a good idea at the time

Thank you,



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**University Cancer
Research Fund**

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CANCER CENTER

UNC Lineberger Cancer Network

The Telehealth Team

Tin Pao, Director

<p>Mary King, Executive Coordinator</p> <p>Jon Powell, MD, Lineberger Executive Specialist</p> <p>Jesse Taylor, Lineberger Support Specialist</p>	<p>Veneranda Oburu, Lineberger Support Specialist</p> <p>Oliver Marth, Lineberger Support Specialist</p> <p>Andrew Dufgson, DPT, Lineberger Executive Specialist</p>
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UPCOMING LIVE WEBINARS

<p>PATIENT CENTERED CARE</p> <p><small>Free</small></p> <p>September 14</p> <p>12:00 PM</p>	<p>An Introduction to Cancer Registry Operations</p> <p>Isaiah Zippie, CTR</p>
<p>ADVANCED PRACTICE PROVIDER</p> <p><small>Free</small></p> <p>September 21</p> <p>4:00 PM</p>	<p>Principles of Pharmacologic and Interventional Management of Cancer Pain</p> <p>Dominika James, MD</p>
<p>RESEARCH TO PRACTICE</p> <p><small>Free</small></p> <p>September 28</p> <p>12:00 PM</p>	<p>Demystifying Molecular-Based Tests in Head and Neck Cancers</p> <p>Siddharth Sheth, DO, MPH</p>

Complete details on upcoming LIVE webinars:
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SELF-PACED, ONLINE COURSES

<p>PATIENT CENTERED CARE</p> <p><small>Self-Paced</small></p>	<p>Cancer Genetics and Genetic Testing - It's Not All in the Family</p> <p>Kate Foreman, MS, CGC</p>
<p>ADVANCED PRACTICE PROVIDER</p> <p><small>Self-Paced</small></p>	<p>Laboratory Workup for Transfusion Reactions</p> <p>Mariama Evans, MD</p>
<p>RESEARCH TO PRACTICE</p> <p><small>Self-Paced</small></p>	<p>Advances in Peri-Operative Therapy in Bladder and Kidney Cancer</p> <p>Tracy L. Rose, MD, MPH</p>

Today's webinar will be available in October 2022 as a FREE, Self-Paced, Online Course. Complete details on Self-Paced Online Courses:
learn.unccn.org/spoc

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THANK YOU FOR PARTICIPATING!

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