

CARVER COLLEGE OF MEDICINE CURRICULUM VITAE

Ryan Flynn

May 2024

I. EDUCATIONAL AND PROFESSIONAL HISTORY

A. List of institutions attended (earliest to most recent)

2002	BA (Physics and Mathematics) - Luther College, Decorah, Iowa Magna Cum Laude
2004	MS (Medical Physics) - University of Wisconsin-Madison, Madison, Wisconsin
2007	PhD (Medical Physics) - University of Wisconsin-Madison, Madison, Wisconsin

Certifications

2011 - Present	Therapeutic Medical Physics, American Board of Radiology
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B. Professional Development Activities

C. Employment History

2002 - 2005	Graduate Research Assistant, Medical Physics University of Wisconsin-Madison
2005	Guest Scientist, Department of Medical Physics in Radiation Oncology The German Cancer Research Center (DKFZ), Heidelberg, Germany
2006	Medical Physics Intern, Department of Radiation Oncology Turville Bay MRI & Radiation Oncology Center
2005 - 2007	Graduate Research Assistant, Department of Medical Physics University of Wisconsin-Madison
2007 - 2012	Adjunct Professor, Department of Medical Physics University of Wisconsin-Madison
2007 - 2013	Clinical Assistant Professor, Department of Radiation Oncology University of Iowa
2010 - 2013	Technical Director of Proton Therapy, Department of Radiation Oncology University of Iowa
2014 - 2019	Clinical Associate Professor, Department of Radiation Oncology University of Iowa
2013 - Present	Director of Medical Physics Division, Department of Radiation Oncology University of Iowa
2019 - Present	Clinical Professor, Department of Radiation Oncology University of Iowa, Iowa City, California, United States

D. Honors, Awards, Recognitions, Outstanding Achievements

2002	Phi Beta Kappa Member
2006	First Prize, student scientific presentation, North Central Chapter of the AAPM Bi-Annual Meeting - AAPM
2007	Vilas Travel Fellowship for Proton Therapy Co-Operative Group (PTCOG) Meeting in Zibo, China - University of Wisconsin Department of Medical Physics
2009	Selection (by David Nelms) to attend Undergraduate Honors Presidential Dinner at University of Iowa President Mason's Residence - University of Iowa
2009	University of Iowa Radiation Oncology Clinical Trial Research Award for Patient Accrual - University of Iowa Department of Radiation Oncology
2010	Iowa Center for Research by Undergraduates (ICRU) Distinguished Mentor Award - ICRU
2010	Iowa Centers for Enterprise Elevator Pitch Competition: 1st (of 36). \$10,000 prize - Iowa Centers for Enterprise
2012	Selection (by Drake Edwards) to attend Undergraduate Honors University of Iowa Presidential Dinner at President Mason's Residence
2014	John Pappajohn Entrepreneurial Center Business Model Competition (Company: pxAlpha, with Blake Dirksen) 1st (of 33) \$7,500 prize - John Pappajohn Entrepreneurial Center Business
2014	Moses and Sylvia Greenfield Award for Best Scientific Paper in the Journal: Medical Physics
2019	Farrington Daniels Award for an Outstanding Paper on Radiation Therapy Dosimetry, Planning or Delivery, Published in Medical Physics
2019	Fellow - American Association of Physicists in Medicine

II. TEACHING

A. Teaching assignments

Classroom, Seminar, Teaching Laboratory

2008	Medical Physics 077:211
2009, 2011, 2012	Foundations of Clinical Practice I: Case based learning
2009, 2010, 2011, 2013	Radiation Oncology Medical Physics Lecture Series
2010	Imaging Physics for Diagnosis and Radiation Therapy

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2010, 2012	Medical Physics 077:211
2011	Radiation Oncology Medical Physics Lecture Series
2015	RSTH 3215, Medical Physics II
2016, 2022, 2023	Foundations of Clinical Practice II: Case Base Learning, Facilitator
2023	RSTH 3110, Medical Physics I, 12 one-hour lectures

Clinical Teaching

2008 - 2010	High/Low Dose Rate Brachytherapy Planning and Delivery
2008 - 2013	External Beam Radiation Delivery Procedures
2008 - 2016	Portal Imaging for Treatment Verification (rotation)
2008 - 2017	Linear Accelerator Quality Assurance

B. Student Supervision (* indicates chair of the committee)

Graduate Students

2010 - 2012	Wenjun Yang - Biomedical Engineering - M.S. Medical Physics Ph.D. Program, University of Wisconsin-Madison <i>Research advisor on M.S. thesis committee</i>
2011 - 2015	Xing Li - Physics - Ph.D. Medical Physics Residency, Miami University <i>Research advisor on Ph.D. thesis committee</i>
2013 - 2017	Hossein Dadkhah - Biomedical Engineering - Ph.D. Medical Physics Residency, University of Chicago <i>Research advisor on Ph.D. thesis committee</i>
2014 - 2020	Cameron Cushing - UI Free Radical Radiation Biology - Ph.D. <i>Advisor: Vince Magnotta</i>
2016 - 2020	Karolyn Hopfensperger - Biomedical Engineering <i>Research advisor on Ph.D. thesis committee</i>
2018 - 2024	Laura Bennett - Biomedical Engineering <i>Research Advisor on Ph. D. thesis committee</i>

Internship Advisor

2008	Julia Hartmann - Engineer Siemens Oncology Care Systems
2010	Jared Stiles - Radiation Therapist University of Iowa
2013 - 2014	Renjena Hareendran - Engineer University of Iowa

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Medical Students

2012 Elizabeth Breitbach - M.D.
UI Carver College of Medicine

2012 - 2018 Quentin Adams
UI Carver College of Medicine

Residents

2007 - 2008 Earl Nixon - M.S. - Medical Physics
Faculty Medical Physicist, University of Iowa

2007 - 2008 Hemant Shukla - M.S. - Medical Physics
Medical Physicist, OSF St. Francis, Peoria, IL

2008 - 2009 Samuel Andrews - M.D. - Radiation Oncology Residency
Radiation Oncologist, SwedishAmerican, Rockford, IL

2007 - 2010 William Kearney - Ph.D. - Medical Physics
Post-doctoral Scholar, University of Iowa

2008 - 2010 Vibha Chaswal - Ph.D. - Medical Physics
Medical Physicist, Forsyth Medical Center, Winston-Salem, NC

2008 - 2010 Xiaofei Ying - M.S. - Medical Physics
Medical Physicist, Sentara Healthcare System, Virginia Beach, VA

2009 - 2011 Junyi Xia - Ph.D. - Medical Physics
Faculty Medical Physicist, University of Iowa

2010 - 2012 Daniel Hyer - Ph.D. - Medical Physics
Faculty Medical Physicist, University of Iowa

2010 - 2012 Yunfei Huang - Ph.D. - Medical Physics
Medical Physicist, Rhode Island Hospital

2011 - 2013 Christopher Mart - M.S. - Medical Physics
Faculty Medical Physicist, University of Iowa

2012 - 2014 Patrick Hill - Ph.D. - Medical Physics
Faculty Medical Physicist, University of Wisconsin-Madison

2013 - 2015 Tyler Collums - Ph.D. - Medical Physics
Medical Physicist, Medical Physics Consulting, Inc., Owasso, OK

2014 - 2016 Adam Dalhart - M.S. - Medical Physics
Faculty Medical Physicist, University of Iowa

2015 - 2017 Edgar Gelover-Reyes - Ph.D. - Medical Physics
Proton Therapy Fellow, Mayo Clinic, Rochester, MN

2016 - 2018 Jeffrey Snyder - M.S. - Medical Physics
Faculty Medical Physicist, University of Iowa

2016 - 2018 Linda Poplawski - M.S. - Medical Physics
Faculty Medical Physicist, West Virginia University, WV

2017 - 2019 Stephen Graves - Ph.D. - Medical Physics

2018 - 2020 Amanda Boczkowski - Ph.D. - Medical Physics

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2019 - 2021	Sarah Strand - Ph.D. - Medical Physics
2020 - 2022	Blake Smith - Ph.D. - Medical Physics
2021 - 2023	Whitney Massock – M.S. – Medical Physics
2022 – Present	Wil Ferris PhD – Medical Physics
2022 – Present	Joe Caron M.S. – Medical Physics
2023 – Present	Nicholas Carlson M.S. – Medical Physics
2022 – Present	Yen-Po Li M.S. – Medical Physics

Thesis Committee

2010 - 2014	Yunlong Liu - UI Department of Electrical and Computer Engineering - Ph.D. <i>Advisor: Xiaodong Wu, Ph.D.</i>
2014	Ouided Rouabhi - UI Department of Biomedical Engineering - M.S. <i>Advisor: Junyi Xia, Ph.D.</i>
2013 - 2016	Levent Sensoy - UI Department of Physics - Ph.D. <i>Advisor: John Sunderland, Ph.D.</i>
2018 - Present	Theodore Geoghegan - UI Department of Biomedical Engineering - Ph.D. <i>Advisor: Dan Hyer, Ph.D.</i>
2019 - 2022	Ashok Tiwari - UI Department of Physics - Ph.D. <i>Advisor: John Sunderland, Ph.D.</i>
2020 - 2023	Jeffrey Snyder - UI Department of Biomedical Engineering - Ph.D. <i>Advisor: Dan Hyer, Ph.D.</i>

Undergraduate Honors Thesis

2008 - 2009	David Nelms - Undergraduate - Physics <i>Assessment of three simple methods for dead detector correction in cone beam computed tomography</i>
2009	Justin Jian Guan - Undergraduate - Biomedical Engineering <i>Management of megavoltage cone beam computed tomography (MVCBCT) imaging dose for head and neck cancer patients</i>
2009 - 2012	Drake Edwards - Undergraduate - Physics <i>Development of an apparatus and method for treating cancerous tumors through multiple rotating shield brachytherapy (M-RSBT)</i>
2011 - 2012	Jeff Moon - Undergraduate - Biomedical Engineering <i>Development of novel nano-cocystal contrast agents for potential use in diagnostic imaging</i>

Undergraduate Students

2009 - 2010	Adam Schwertner - Research Assistant - Biomedical Engineering
2010 - 2011	Elizabeth Breitbach - Research Assistant - Biomedical Engineering
2012 - 2014	Jingzhu Xu - Research Assistant - Biomedical Engineering
2018	Jacob Buatti - Research Assistant University of Minnesota Department of Physics

C. Other Teaching Contributions

Institutional Conferences, Grand Rounds, Journal Clubs, Etc.

2008 - Present Radiation Oncology Medical Physics Journal Club and Translational Research Meeting

Other Teaching Contributions

2010 - 2015 Biomedical Engineering Senior Design Group Mentor - University of Iowa

2015 - 2016 Mechanical Engineering Senior Design Group Mentor - University of Iowa

2011 - 2017 Iowa Medical Innovation Group - University of Iowa

III. SCHOLARSHIP/PROFESSIONAL PRODUCTIVITY

A. Publications or creative works (earliest to most recent)

Peer-reviewed papers and journal articles

1. **Flynn RT**, Barbee DL, Mackie TR, Jeraj R. Comparison of intensity modulated x-ray therapy and intensity modulated proton therapy for selective subvolume boosting: a phantom study, *Phys Med Biol.* 2007;52(20):6073-91. PMID:17921573. PMCID: PMC27112448. doi: 10.1088/0031-9155/52/20/001.
2. Kissick MW, **Flynn RT**, Westerly DC, Mackie TR, Hoban PW. On the making of sharp longitudinal dose profiles with helical tomotherapy, *Phys Med Biol.* 2007;52(21):6497-510. PMID:17951858. PMCID: PMC2220158. doi: 10.1088/0031-9155/52/21/011.
3. Caporaso GJ, Mackie TR, Sampayan S, Chen Y-J, Blackfield D, Harris J, Hawkins S, Holmes C, Nelson S, Paul A, Poole B, Rhodes M, Sanders D, Sullivan J, Wang L, Watson J, Reckwerdt PJ, Schmidt R, Pearson D, **Flynn R**, Matthews D, Purdy J. A compact linac for intensity modulated proton therapy based on a dielectric wall accelerator, *Phys Med.* 2008;24(2):98-101. PMID:18430600. doi: 10.1016/j.ejmp.2008.01.010.
4. **Flynn RT**, Bowen SR, Bentzen SM, Rockwell Mackie T, Jeraj R. Intensity-modulated x-ray (IMXT) versus proton (IMPT) therapy for theragnostic hypoxia-based dose painting, *Phys Med Biol.* 2008;53(15):4153-67. PMID:18635895. PMCID: PMC2695924. doi: 10.1088/0031-9155/53/15/010.
5. Kissick MW, **Flynn RT**, Westerly DC, Hoban PW, Mo X, Soisson ET, McCall KC, Mackie TR, Jeraj R. On the impact of longitudinal breathing motion randomness for tomotherapy delivery, *Phys Med Biol.* 2008;53(18):4855-73. PMID:18711250. PMCID: 2712448. doi: 10.1088/0031-9155/53/18/001.
6. **Flynn RT**, Kissick MW, Mehta MP, Olivera GH, Jeraj R, Mackie TR. The impact of linac output variations on dose distributions in helical tomotherapy, *Phys Med Biol.* 2008;53(2):417-30. PMID:18184996. PMCID: PMC2713685. doi: 10.1088/0031-9155/53/2/009.
7. Nelms DW, Shukla HI, Nixon E, Bayouth JE, **Flynn R**. Assessment of three dead detector correction methods for cone beam computed tomography, *Med Phys.* 2009;36(10):4569-4576. PMID:19928088. doi: <http://dx.doi.org/10.1118/1.3222730>.

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8. **Flynn R**, Hartmann J, Bani-Hashemi A, Nixon E, Siochi RA, Pennington EC, Bayouth JE. Dosimetric characterization and application of an imaging beam line with a carbon electron target for megavoltage cone beam computed tomography, *Med Phys*. 2009;36(6):2181-2192. PMID:19610307.
9. Bowen SR, **Flynn RT**, Bentzen SM, Jeraj R. On the sensitivity of IMRT dose optimization to the mathematical form of a biological imaging-based prescription function, *Phys Med Biol*. 2009;54(6):1483-501. PMID:19218733. PMCID: PMC2858011. doi: 10.1088/0031-9155/54/6/007.
10. Barbee DL, **Flynn RT**, Holden JE, Nickles RJ, Jeraj R. A method for partial volume correction of PET-imaged tumor heterogeneity using expectation maximization with a spatially varying point spread function, *Phys Med Biol*. 2010;55(1):221-36. PMID:20009194. doi: 10.1088/0031-9155/55/1/013.
11. **Flynn R**. Loss of radiobiological effect of imaging dose in image guided radiotherapy due to prolonged imaging-to-treatment times, *Med Phys*. 2010;37(6):2761-2769. PMID:20632586.
12. Breitbach EK, Maltz JS, Gangadharan B, Bani-Hashemi A, Anderson CM, Bhatia SK, Stiles J, Edwards DS, **Flynn RT**. Image quality improvement in megavoltage cone beam CT using an imaging beam line and a sintered pixelated array system, *Med Phys*. 2011;38(11):5969-79. PMID:22047361. doi: 10.1118/1.3651470.
13. Kissick MW, Mackie TR, **Flynn RT**, Mo X, Campos DD, Yhan Y, Zhao D. Investigation of probabilistic optimization for tomotherapy., *Journal of Applied Clinical Medical Physics/American College of Medical Physics*. 2012 September 6;13(5):3865. PMID:22955654. doi: 10.1120/jacmp.v13i5.3865.
14. Zhang M, **Flynn RT**, Mo X, Mackie TR. The energy margin strategy for reducing dose variation due to setup uncertainty in intensity modulated proton therapy (IMPT) delivered with distal edge tracking (DET), *J Appl Clin Med Phys*. 2012 September 6;13(5):170-180. PMID:22955652. PMCID: PMC4439946. doi: 10.1120/jacmp.v13i5.3863.
15. Westerly DC, Schefter TE, Kavanagh BD, Chao E, Lucas D, **Flynn RT**, Miften M. High-dose MVCT image guidance for stereotactic body radiation therapy, *Med Phys*. 2012;39(8):4812-9. PMID:22894407. doi: 10.1118/1.4736416.
16. Sun W, Bhatia SK, Jacobson GM, **Flynn RT**, Kim Y. Target volume changes through high-dose-rate brachytherapy for cervical cancer when evaluated on high resolution (3.0 Tesla) magnetic resonance imaging., *Pract Radiat Oncol*. 2012;2(4):e101-6. PMID:24674171. doi: 10.1016/j.prro.2012.03.012.
17. Becker SJ, Culberson W, **Flynn RT**. Collision indicator charts for gantry-couch position combinations for Siemens ONCOR and Elekta Infinity linacs, *J Appl Clin Med Phys*. 2013;14(5):278-83. PMID:24036873. doi: 10.1120/jacmp.v14i5.4355.
18. Liu Y, **Flynn RT**, Kim Y, Yang W, Wu X. Dynamic rotating-shield brachytherapy, *Med Phys*. 2013;40(12):121703. PMID:24320489. doi: 10.1118/1.4828778.
19. Huang Y, **Flynn RT**, Siochi RA, Bayouth JE. Equivalent-quality unflattened photon beam modeling, planning, and delivery, *J Appl Clin Med Phys*. 2013;14(4):4211. PMID:23835385. doi: 10.1120/jacmp.v14i4.4211.
20. Enger SA, Fisher DR, **Flynn RT**. Gadolinium-153 as a brachytherapy isotope, *Phys Med Biol*. 2013;58(4):957-64. PMID:23339848. doi: 10.1088/0031-9155/58/4/957.
21. Anderson JW, Xia J, **Flynn RT**, Modrick JM, Bhatia SK, Jacobson GM, Kim Y. High resolution (3 Tesla) MRI-guided conformal brachytherapy for cervical cancer:

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- consequences of different high-risk CTV sizes, *J Contemp Brachytherapy*. 2013;5(2):101-9. PMID:23878555. doi: 10.5114/jcb.2013.36180.
22. Liu Y, **Flynn RT**, Yang W, Kim Y, Bhatia SK, Sun W, Wu X. Rapid emission angle selection for rotating-shield brachytherapy, *Med Phys*. 2013;40(5):051720. PMID:23635268. doi: 10.1118/1.4802750.
 23. Yang W, Kim Y, Wu X, Song Q, Liu Y, Bhatia SK, Sun W, **Flynn RT**. Rotating-shield brachytherapy for cervical cancer, *Phys Med Biol*. 2013;58(11):3931-41. PMID:23680601. doi: 10.1088/0031-9155/58/11/3931.
 24. Hyer DE, Hill PM, Wang D, Smith BR, **Flynn RT**. A dynamic collimation system for penumbra reduction in spot-scanning proton therapy: proof of concept, *Med Phys*. 2014;41(9):091701. PMID:25186376. doi: 10.1118/1.4837155.
 25. Moghaddas TA, Ghorbani M, Haghparast A, **Flynn RT**, Eivazi MT. A Monte Carlo Study on Dose Enhancement Effect of Various Paramagnetic Nanoshells in Brachytherapy, *J Med Biol Eng*. 2014;34(6):559-567. doi: 10.5405/jmbe.1769.
 26. Liu Y, **Flynn RT**, Kim Y, Wu X. Asymmetric dose-volume optimization with smoothness control for rotating-shield brachytherapy, *Med Phys*. 2014;41(11):111709. PMID:25370623. doi: 10.1118/1.4897617.
 27. Hyer DE, Hill PM, Wang D, Smith BR, **Flynn RT**. Effects of spot size and spot spacing on lateral penumbra reduction when using a dynamic collimation system for spot scanning proton therapy, *Phys Med Biol*. 2014;59(22):N187-96. PMID:25330783. doi: 10.1088/0031-9155/59/22/N187.
 28. Wang D, Dirksen B, Hyer DE, Buatti JM, Sheybani A, Dinges E, Felderman N, TenNapel M, Bayouth JE, **Flynn RT**. Impact of spot size on plan quality of spot scanning proton radiosurgery for peripheral brain lesions, *Med Phys*. 2014;41(12):121705. PMID:25471952. doi: 10.1118/1.4901260.
 29. Adams QE, Xu J, Breitbach EK, Li X, Enger SA, Rockey WR, Kim Y, Wu X, **Flynn RT**. Interstitial rotating shield brachytherapy for prostate cancer, *Med Phys*. 2014;41(5):051703. PMID:24784369. doi: 10.1118/1.4870441.
 30. Li H, Bai J, Wu X, Bhatia SK, Abu-Hejleh T, Sun W, TenNapel MJ, Menda Y, Mart CJ, McGuire SM, **Flynn RT**. Semi-Automated Co-Segmentation of Tumor Volume Using Multimodality PET-CT in Non-Small Cell Lung Cancer (NSCLC), *Austin Journal of Cancer and Clinical Research*. 2014;1(3):1-6.
 31. Wang D, Smith BR, Gelover E, **Flynn RT**, Hyer DE. A method to select aperture margin in collimated spot scanning proton therapy, *Phys Med Biol*. 2015 March;60(7):N109-119. PMID:25776926. doi: 10.1088/0031-9155/60/7/N109.
 32. Gelover E, Wang D, Hill PM, **Flynn RT**, Gao M, Laub S, Pankuch M, Hyer DE. A method for modeling laterally asymmetric proton beamlets resulting from collimation, *Med Phys*. 2015;42(3):1321-34. PMID:25735287. doi: 10.1118/1.4907965.
 33. Morel P, **Flynn RT**, Gelover-Reyes E, Blin G, Vialette S, Wu X, Wang D. MSOT: An open-source motion simulator for proton therapy, *Biomedical Physics & Engineering Express*. 2015;1(03700):1-7.
 34. Dadkhah H, Kim Y, Wu X, **Flynn RT**. Multi-Helix Rotating Shield Brachytherapy for Cervical Cancer, *Med Phys*. 2015;42(11):6579-6588. PMID:26520749. PMCID: 5148119. doi: 10.1118/1.4933244.
 35. Liu Y, **Flynn RT**, Kim Y, Dadkhah H, Bhatia SK, Buatti JM, Xu W, Wu X. Paddle-based rotating-shield brachytherapy, *Med Phys*. 2015;42(10):5992-6003. PMID:26429274. PMCID: 5148177. doi: 10.1118/1.4930807.

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36. Wang D, Nixon E, Oldham A, **Flynn R**, Buatti J. Personalized imaging in radiation oncology. In regard to Zhang et al, Int J Radiat Oncol Biol Phys. 2015;93(1):211. PMID:26279039. doi: 10.1016/j.ijrobp.2015.04.014.
37. Morel P, Wu X, Blin G, Vialette S, **Flynn RT**, Hyer D, Wang D. Spot weight adaptation for moving target in spot scanning proton therapy, Front Oncology. 2015;5(119):1-7.
38. Moignier A, Gelover E, Smith BR, Wang D, **Flynn RT**, Kirk ML, Lin L, Solberg TD, Lin A, Hyer DE. Toward improved target conformity for two spot scanning proton therapy delivery system using dynamic collimation, Med Phys. 2016 March;43(3):1421-1427. PMID:26936726. doi: 10.1118/1.4942375.
39. Moignier A, Gelover E, Wang D, Smith B, **Flynn R**, Kirk M, Lin L, Solberg T, Lin A, Hyer D. Theoretical Benefits of Dynamic Collimation in Pencil Beam Scanning Proton Therapy for Brain Tumors: Dosimetric and Radiobiological Metrics, Int J Radiat Oncol Biol Phys. 2016 May 1;95(1):171-80. PMID:26614424. doi: 10.1016/j.ijrobp.2015.08.030.
40. Smith B, Gelover E, Moignier A, Wang D, **Flynn RT**, Lin L, Kirk M, Solberg T, Hyer DE. Technical Note: A treatment plan comparison between dynamic collimation and a fixed aperture during spot scanning proton therapy for brain treatment, Med Phys. 2016;43(8):4693. PMID:27487886. doi: 10.1118/1.4955117.
41. Wears B, Mohiuddin I, **Flynn R**, Kim Y, Waldron T, Allen B, Xia J. Design of a compact collimator and 3D imaging system for a scanning beam low-energy intraoperative radiation therapy system for pancreatic cancer, IEEE Engineering in Medicine and Biology Society (EMBC). 2017 July 11:4325-4328. PMID:29060854. doi: 10.1109/EMBC.2017.8037813.
42. Plichta K, Camden N, Furqan M, Abu Heijleh T, Clamon GH, Zhang J, **Flynn RT**, Bhatia SK, Smith MC, Buatti JM, Allen BG. SBRT to Adrenal Metastases Provides High Local Control with Minimal Toxicity Advances in Radiation Oncology, Advances in Radiation Oncology. 2017 August 4;2(4):581-587. PMID:29204525. doi: 10.1016/j.adro.2017.07.011.
43. Snyder J, **Flynn RT**, Hyer DE. Implementation of Respiratory-Gated VMAT on a Versa HD Linear Accelerator, J Appl Clin Med Phys. 2017 August 18;18(5):152-161. PMID:28834109. doi: 10.1002/acm2.12160.
44. Cho M, Wu X, Dadkhah H, Yi J, **Flynn RT**, Kim Y, Xu W. Fast Dose Optimization for Rotating Shield Brachytherapy, Med Phys. 2017 October;44(10):5384-5392. PMID:28744870. PMCID: PMC5943050. doi: 10.1002/mp.12486.
45. Dadkhah H, Hopfensperger KM, Kim Y, Wu X, **Flynn RT**. Multisource Rotating Shield Brachytherapy Apparatus for Prostate Cancer, Int J Radiat Oncol Biol Phys. 2017 November 1;99(3):719-728. PMID:28843372. PMCID: PMC5738279. doi: 10.1016/j.ijrobp.2017.06.008.
46. Ding GX, Alaei P, Curran B, **Flynn RT**, Gossman M, Mackie TR, Miften M, Morin R, Xu XG, Zhu TC. Image guidance doses delivered during radiotherapy: Quantification, management, and reduction: Report of the AAPM Therapy Physics Committee Task Group 180, Med Phys. 2018 May;45(5):e84-99. PMID:29468678. doi: 10.1002/mp.12824.
47. Adams Q, Hopfensperger KM, Kim Y, Wu X, Xu W, Shukla H, McGee J, Caster JM, **Flynn RT**. Effectiveness of Rotating Shield Brachytherapy for Prostate Cancer Dose Escalation and Urethral Sparing, Int J Radiat Oncol Biol Phys. 2018 December 1;102(5):1543-1550. PMID:30092333. PMCID: PMC6363898. doi: 10.1016/j.ijrobp.2018.07.2015.

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48. Snyder JE, Hyer DE, **Flynn RT**, Boczkowski A, Wang D. The Commissioning and Validation of Monaco Treatment Planning System on an Elekta VersaHD Linear Accelerator, *Journal of Applied Clinical Medical Physics*. 2018 December 7. doi: 10.1002/acm2.12507.
49. Smith BR, Hyer DE, **Flynn RT**, Culberson WS. Technical Note: Optimization of Spot and Trimmer Position During Dynamically Collimated Proton Therapy, *Med Phys*. 2019 April 1;46(4):1922-1930. PMID:30740709. PMCID: PMC6676890. doi: 10.1002/mp.13441.
50. Smith BR, Hyer DE, **Flynn RT**, Hill PM, Culberson WS. Trimmer Sequencing Time Minimization During Dynamically Collimated Proton Therapy Using a Colony of Cooperating Agents, *Phys Med Biol*. 2019 October 21;64(20):205025-205035. PMID:31484170. PMCID: PMC6995666. doi: 10.1088/1361-6560/ab416d.
51. Graves SA, **Flynn RT**, Hyer DE. Dose Point Kernels for 2,174 Radionuclides, *Med Phys*. 2019 November 1;46(11):5284-5293. PMID:31461537. doi: 10.1002/mp.13789.
52. Spitz DR, Buettner GR, Petronek MS, St-Aubin JJ, **Flynn RT**, Waldron TJ, Limoli CL. An integrated physico-chemical approach for explaining the differential impact of FLASH versus conventional dose rate irradiation on cancer and normal tissue responses, *Radiother Oncol*. 2019;139:23-27. PMID:31010709. doi: 10.1016/j.radonc.2019.03.028.
53. **Flynn RT**, Adams QE, Hopfensperger KM, Wu X, Xu W, Kim Y. Efficient ¹⁶⁹Yb High-Dose-Rate Brachytherapy Source Production using Re-activation, *Med Phys*. 2019;46(7):2935-2943. PMID:31054163. PMCID: PMC6905186. doi: 10.1002/mp.13563.
54. Callaghan C, Adams Q, **Flynn RT**, Wu X, Xu W, Kim Y. Systematic Review of Intensity-Modulated Brachytherapy (IMBT): Static and Dynamic Techniques, *Int J Radiat Oncol Biol Phys*. 2019;105(1):206-221. PMID:31026556. doi: 10.1016/j.ijrobp.2019.04.009.
55. Cunha JAM, **Flynn RT**, Bélanger C, Callaghan C, Kim Y, Jia X, Chen Z, Beaulieu L. Brachytherapy Future Directions, *Semin Radiat Oncol*. 2020 January 1;30(1):94-106. PMID:31727305. doi: 10.1016/j.semradonc.2019.09.001.
56. Geoghegan TJ, Nelson NP, **Flynn RT**, Hill PM, Rana S, Hyer DE. Design of a focused collimator for proton therapy spot scanning using Monte Carlo methods, *Med Phys*. 2020 March 13;47(7):2725-2734. PMID:32170750. doi: 10.1002/mp.14139.
57. Tiwari A, Sunderland J, Graves SA, Strand S, **Flynn R**. Absorbed Dose Distributions from Beta-Decaying Radionuclides: Experimental Validation of Monte Carlo Tools for Radiopharmaceutical Dosimetry, *Med Phys*. 2020 September 21;47:5779-5990. PMID:32955755. doi: 10.1002/mp.14463.
58. Buatti JS, Buatti JM, Yaddanapudi S, Pennington EC, Wang D, Gross B, St-Aubin JJ, Hyer DE, Smith MC, **Flynn RT**. Stereotactic Radiotherapy of Meningiomas and Tumor Beds with Gamma Knife Icon versus Volumetric Modulated Arc Therapy, *J Appl Clin Med Phys*. 2020 November 18. Published. PMID:33207030. doi: 10.1002/acm2.13100.
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Intellectual Property (e.g. Patents, Copyrights)

1. **Flynn RT**, Kim Y US 20140249406 A1, "Compensator-Based Brachytherapy."
2. **Flynn RT**, Hyer DE, Wang D, Hill PM, Claereboudt Y. US Patent 9,776,017, "Method and System for Dynamically-Trimmed Spot Scanning for Ion Therapy."
3. **Flynn RT**, Dadkhah H. US 10,029,118 B2, "Advanced Rotating-Shield Brachytherapy and Planning of the Same."
4. **Flynn RT**, Dadkhah H, Patwardhan K, Cho M. US Patent 11,013,935 B2, "A Rotating Shield Brachytherapy System."
5. **Flynn RT**, Hopfensperger KM, Adams QE, US 17/428,035, "Re-Activatable Radiation Source for Brachytherapy."
6. **Flynn RT**, Adams QE, WO 2020/191007, "Rotating Shield Brachytherapy Apparatus and Method."
7. **Flynn RT**, Kim Y, Wu X, Adams Q, Hopfensperger K. US Patent 11,541,251 B2, "Apparatus and Method for a Rotating Shield Brachytherapy."
8. Graves SA, **Flynn RT**, "Collapsed-Cone Convolution Superposition (CCCS) Dosimetry for Therapeutic Radiopharmaceuticals."
9. **Flynn RT**, Adams QE, PCT/US2021/015628 "A Modular Remote Afterloader Apparatus for Temporary Brachytherapy Delivery."
10. **Flynn RT**, Xia J, Waldron T, Kim Y, Allen BG, Wears BM, Ding H, US Patent 10,617,885 B2, "System and Method for an Intensity Modulated Radiation Therapy Device."

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11. Mackie TR, **Flynn RT**, US Patent 7,977,657, "Ion Radiation Therapy System with Distal Gradient Tracking."
12. Mackie TR, Kissick MW, **Flynn RT**, US Patent 8,093,568, "Ion Radiation Therapy System with Rocking Gantry Motion."
13. **Flynn RT**, Mackie TR, US Patent 7,763,873, "Ion Radiation Therapy System with Variable Beam Resolution."
14. **Flynn RT**, Mackie TR, US Patent 8,154,001, "Ion Radiation Therapy System with Variable Beam Resolution."
15. Mackie TR, **Flynn RT**, Kissick MW, Al-Sadah JH, Westerly DC, Hill PM, US Patent 7,714,309, "Phantom for Heavy Ion Range Detection."
16. Westerly DC, Mackie TR, **Flynn RT**, US Patent 7,977,648, "Scanning Aperture Ion Beam Modulator."
17. **Flynn RT**, Mackie TR, US Patent 7,856,082, "System and Method for Optimization of a Radiation Therapy Plan in the Presence of Motion."
18. Smith BR, **Flynn RT**, Hyer DE, Invention Disclosure submitted to UIRF, PCT application (PCT/US23/84756) filed December 19, 2023, "Beam filtration apparatus and method for efficient scanned beam particle arc therapy."

B. Media Contributions

C. Areas of Research Interest

Research Summary.

Research interests include novel brachytherapy delivery techniques, MRI-guided radiation therapy, ultra-high-dose-rate (FLASH) radiotherapy, and proton therapy

D. Grants

Active

The re-activatable Yb-169 radiation source: a therapeutic medical device to reduce the risk of brachytherapy and increase adoption

NIH

R41 CA268293

August 1, 2022 – July 31, 2024

\$300,000

Percent effort: 10

Flynn, Ryan (Principal Investigator)

Midwest FLASH Lab: Developing next-generation radiotherapy delivery and expertise at the University of Iowa

University of Iowa Public-Private Partnership (P3)

July 1, 2022 – June 30, 2025

\$3,000,000

Percent effort: 0

Buatti, John (Principal Investigator), Flynn, Ryan (Co-Investigator)

Ryan Flynn – May 2024

Sharpening the edge in pencil-beam proton therapy: an aftermarket collimation system to better spare normal tissue during radiation treatment.

NIH

R37 CA226518 01A1

September 1, 2018 - August 31, 2023

\$2,526,911

Percent effort: 10

Hyer, Dan (Principal Investigator), Flynn, Ryan (Co-Investigator)

Completed

Intensity modulated brachytherapy for the treatment of cervical cancer

American Cancer Society

IRG-77-004-31

July 1, 2010 - June 30, 2011

\$30,000

Flynn, Ryan (Principal Investigator), Kim, Yusung (Co-Investigator), Jacobson, Geraldine (Co-Investigator), Wu, Xiaodong (Co-Investigator)

Nano-Cocrystal Contrast Agents

Clinical & Translational Science Award

NIH

June 1, 2011 - May 31, 2012

\$50,000

MacGillivray, Leonard (Principal Investigator), Flynn, Ryan (Co-Investigator)

Reducing invasiveness and increasing access to tumor conformal brachytherapy for cervical cancer

Grow Iowa Values Fund

Seed Grant

November 2011 - May 2012

\$36,701

Flynn, Ryan (Principal Investigator)

Rotating-shield intensity modulated brachytherapy for cervical cancer

American Cancer Society

IRG-77-004-34

July 1, 2011 - June 30, 2012

\$30,000

Flynn, Ryan (Principal Investigator), Kim, Yusung (Co-Investigator), Jacobson, Geraldine (Co-Investigator)

Prototype System Development for Interstitial Rotating Shield Brachytherapy of Prostate Cancer

Iowa Centers for Enterprise

Commercialization GAP Fund Program

January 1, 2013 - December 31, 2013

\$75,000

Flynn, Ryan (Principal Investigator)

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Dynamic Collimation System

Ion Beam Applications SA

Industry Sponsored Grant

August 1, 2014 - November 30, 2015

\$246,007

Percent effort: 5

Hyer, Dan (Principal Investigator), Flynn, Ryan (Co-Investigator)

Administrative Supplement: Developing a Treatment Planning System for Next Generation Rotating-Shield Brachytherapy

NIH

3R01EB020665-02S1

September 1, 2016 - May 1, 2017

\$26,000

Wu, Xiaodong (Principal Investigator), Flynn, Ryan (Co-Investigator), Kim, Yusung (Co-Investigator)

An Automated Patient Chart Error Detection System for Radiation Therapy

NIH

Subaward for Phase I STTR, R41 CA195819, PI of Primary Award: Junyi Xia

September 1, 2016 - February 28, 2018

\$77,928

Percent effort: 1

Flynn, Ryan (Principal Investigator)

A New Prostate Cancer Treatment to Improve Outcomes and Reduce Side-effects

NIH

STTR Phase I, 1R41 CA210737-01

September 15, 2016 - August 31, 2018

\$225,000

Percent effort: 10

Flynn, Ryan (Principal Investigator)

Administrative Supplement: Developing a Treatment Planning System for Next Generation Rotating-Shield Brachytherapy

NIH

R01 EB020665-04S1

September 15, 2018 - June 30, 2019

\$146,774

Percent effort: 2

Wu, Xiaodong (Principal Investigator), Flynn, Ryan (Co-Investigator), Kim, Yusung (Co-Investigator)

Developing a treatment planning system for next generation rotating-shield brachytherapy

NIH

R01 EB020665-01

September 10, 2015 - June 30, 2020

\$1,332,240

Percent effort: 6.67

Wu, Xiaodong (Principal Investigator), Flynn, Ryan (Co-Investigator)

E. Presentations

Conference Presentation

- April 2006 North Central Chapter of the AAPM Bi-Annual Meeting, American Association of Physicists in Medicine. *An investigation of the effects of relatively large linac output variations on dose distributions for IMRT.*
- October 2008 Siemens User Meeting, Siemens. *Improving image quality for megavoltage cone beam computed tomography.*
- July 2011 Joint AAPM-COMP Meeting. *Preparing for ABR board exams.*
- July 2012 AAPM Annual Meeting. *Preparing for ABR board exams.*
- March 2013 University of Iowa. *Opportunities in Radiation Oncology at the University of Iowa.*

Invited Lecture

- October 2008 Japanese Society for Therapeutic Radiology and Oncology (JASTRO), JASTRO. *Improving image quality for megavoltage cone beam computed tomography.*
- February 2010 University of Wisconsin-Madison Medical Physics Seminar, University of Wisconsin. *Improving Megavoltage Cone Beam CT Imaging Quality.*
- July 2010 JASTRO Koseido Symposium. *High dose rate image guided radiation therapy.*
- September 2010 ISTR0 Annual Meeting. *Stereotactic body radiotherapy (SBRT) for lung cancer.*
- November 2010 31st Annual Conference of the Association of Medical Physicists of India, Association of Medical Physicists of India. *Stereotactic body radiotherapy guided by optimized megavoltage cone beam computed tomography.*
- November 2010 32nd Annual Conference of the Association of Radiation Oncologists of India, Association of Radiation Oncologists of India. *High dose rate stereotactic body radiotherapy and megavoltage cone beam computed tomography image guidance.*
- September 2011 ISTR0 Annual Meeting. *Proton Therapy in Iowa City.*
- November 2011 Missouri River Valley AAPM Chapter Meeting, AAPM. *Protons in Iowa City.*
- December 2011 LINAC Radiosurgery. *Introduction to Proton Radiosurgical Considerations.*
- December 2011 LINAC Radiosurgery. *Medical Errors in SRT Delivery.*
- January 2012 West German Proton Therapy Center, Essen Germany. *Proton versus photon radiosurgery of intracranial lesions.*
- June 2012 Uppsala University. *Rotating shield brachytherapy for cervical cancer.* Flynn, RT (Presenter).
- August 2012 AAPM Annual Meeting, AAPM. *Preparing for ABR board exams.*
- October 2012 ISTR0 Annual Meeting. *Update on the proton therapy program at Iowa.*
- January 2013 Washington University in St. Louis. *Opportunities in Proton Therapy and Brachytherapy.*

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- February 2013 University of Wisconsin. *Opportunities in Proton Therapy and Brachytherapy.*
- May 2013 Missouri River Valley AAPM Meeting, AAPM. *Interstitial Rotating Shield Brachytherapy for Prostate Cancer.*
- March 2014 Hall-Perrine Cancer Center Spring Symposium. *Immobilization and Localization for Intracranial Stereotactic Radiosurgery.*
- May 2014 Radiosurgery Society Meeting. *Immobilization and Motion Management for Intracranial Stereotactic Radiosurgery Application.*
- September 2015 McGill University Department of Radiation Oncology. *Rotating Shield Brachytherapy for Prostate and Cervical Cancer.*
- December 2015 University of Wisconsin-Madison, Department of Medical Physics. *Rotating Shield Brachytherapy for Prostate and Cervical Cancer.*
- January 2018 Memorial Sloan Kettering Cancer Center. *Rotating Shield Brachytherapy for Cervical and Prostate Cancer.*
- June 2018 American Brachytherapy Society Annual Meeting, American Brachytherapy Society, San Francisco, California. *Rotating Shield Brachytherapy for Cervical Cancer and Prostate Cancer.*
- July 2018 AAPM Annual Meeting, AAPM, Nashville, Tennessee. *Intensity Modulated Brachytherapy Using Directional Sources.*
- July 2018 AAPM Summer School, Vanderbilt University, Nashville, Tennessee. *X-Ray Based 3-D Image Guidance Methods in Radiation Therapy.*
- March 2019 Round Table Discussion on Gamma Knife Icon, Elekta, Bridgehampton, New York. *Gamma Knife Icon at the University of Iowa.*
- March 2019 Chair's Course: Integrational and Translational Research Meeting, University of California - Los Angeles, Los Angeles, California. *Improving prostate cancer and cervical cancer brachytherapy with Yb-169-based rotating shield brachytherapy.*
- July 2019 AAPM Annual Meeting 2019, San Antonio, Texas. *Re-Inventing High-Dose-Rate Brachytherapy Around Ytterbium-169.*
- July 2020 Korean Association of Medical Physicists in North America Annual Meeting, Virtual Meeting. *Making Rotating Shield Brachytherapy Possible Through Innovations in Yb-169 Generation and Distribution.*
- November 2021 Radiological Society of North America (RSNA) 2021, Chicago, Illinois. *Physic Symposium – Image Guidance in Radiation Therapy – Best of Summer School, X-ray Based Image Guided Radiation Therapy.*
- October 2022 Non-operative management and treatment of patients with rectal cancer, Montreal, Canada. *Novel Radiation Sources for HDR Brachytherapy Applications*
- July 2023 American Association of Physicists in Medicine Annual Meeting, Houston, TX. *Intensity modulated brachytherapy using partially-shielded applicators.*

Poster

- November 2019 65th Annual Meeting Radiation Research Society, RRS, San Diego, California. *Proposal for dedicated research FLASH Irradiation System.* Waldron, T, Flynn, R, St-Aubin, J, Spitz, D, Buatti, J.

Seminar

- March 2009 University of Iowa. *Image quality improvement with and dosimetry of an MVCBCT imaging beam line.*
- April 2009 Translational Research Meeting, University of Iowa. *Improving megavoltage cone beam CT image quality and accounting for imaging dose.*
- January 2010 Electrical and Computer Engineering Graduate Seminar, University of Iowa. *Improving megavoltage cone beam CT image quality and accounting for imaging dose.*
- March 2010 Translational Research Meeting, University of Iowa. *Possibilities for tumor monitoring with implantable devices.*
- May 2011 Prostate Cancer Research Program, University of Iowa. *Intensity modulated brachytherapy for prostate cancer.*
- September 2011 Mechanical Engineering Seminar, University of Iowa. *Intensity Modulated Brachytherapy for Cervical Cancer.*
- January 2012 ECE Graduate Seminar, University of Iowa. *Intensity modulated brachytherapy for cervical cancer.*
- January 2012 Radiation Oncology Translational Research Meeting, Dept. of Radiation Oncology, University of Iowa. *Intensity modulated brachytherapy for cervical cancer.*
- February 2013 Translational Research Meeting, Department of Radiation Oncology - University of Iowa. *Novel Brachytherapy Delivery Techniques for Cervical and Prostate Cancer.*
- September 2013 Translational Research Meeting, Department of Radiation Oncology - University of Iowa. *Gold Nanoparticle Enhanced Rotating Shield Brachytherapy for Cervical Cancer.*
- May 2014 Translational Research Meeting, Department of Radiation Oncology - University of Iowa. *Progress toward commercializing rotating shield brachytherapy.*
- October 2015 Translational Research Meeting, Department of Radiation Oncology - University of Iowa, Iowa City. *Rotating Shield Brachytherapy for Cervical and Prostate Cancer.*
- November 2015 Iowa Institute of Biomedical Imaging Seminar, University of Iowa, Iowa City. *Rotating Shield Brachytherapy Treatment Planning and Delivery System Development.*
- June 2017 Translational Research Meeting, Department of Radiation Oncology - University of Iowa, Iowa City. *One-Shot Prostate Cancer Treatments with Rotating Shield Brachytherapy.*
- March 2019 Translational Research Meeting, Department of Radiation Oncology - University of Iowa, Iowa City, Iowa. *Re-Inventing High-Dose-Rate Brachytherapy around the Ytterbium-169 Radioisotope.*
- January 2020 Translational Research Meeting, Iowa City, Iowa. *Innovations in Yb-169 Production and Distribution to Enable Cost-Effective Rotating Shield Brachytherapy.*

March 2022

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Translational Research Meeting, Iowa City, Iowa. *The Next Generation of High Dose-Rate Brachytherapy Technology*

IV. SERVICE

A. Memberships in Professional Organizations

American Association of Medical Dosimetrists
American Association of Physicists in Medicine
American Brachytherapy Society
American College of Medical Physics
American Society for Therapeutic Radiology and Oncology
European Society for Therapeutic Radiology and Oncology

B. Professional Service

2007 AAPM Student Physicist Association Subcommittee
2009 - 2011 Therapy Standards Committee for ACMP
2009 - 2011 Trainee and Provisional Members Committee for ACMP
2009 - 2018 AAPM Task Group 180-Modeling and accounting for the imaging guidance radiation doses to radiotherapy patients in treatment planning
2015 - 2018 AAPM Research Committee
2014 - 2019 AAPM Radiation Dosimetry & Treatment Planning Subcommittee
2013 - Present AAPM Task Group 198 - An implementation guide for TG-142: QA of medical linear accelerators
2018 - Present American Brachytherapy Society
2019 - Present AAPM Task Group 337 - Intensity Modulated and Anisotropic Brachytherapy Sources (IMABS)

Examiner

2013 - 2015 Missouri River Valley AAPM Chapter Mock Oral Board examinations

Review Panel

2008 - 2009 Technology in Cancer Research and Treatment
2009 Annals of Oncology
2010 - 2011 ACMP Junior Investigators
2011 Radiation Research
2011 - 2013 RSNA Educational Exhibit
2013 Archives of Industrial Hygiene and Toxicology
2013 - 2016 AAPM Proffered Abstracts
2019 Brachytherapy
2019 British Journal of Radiology
2008 - Present Medical Physics
2008 - Present Physics in Medicine and Biology
2009 - Present Radiotherapy and Oncology
2011 - Present Int J of Radiat Oncol Biol Phys
2011 - Present Journal of Applied Clinical Medical Physics
2014 - Present Cancer Letters

C. University, College, Department Service

University

2009 - 2011 Medical Student Candidate Interviews, Interviewer
2016 - 2017 Imaging Equipment Reviews Group, UIHC, Member
2018 - 2019 Summer Research Fellowship Application Reviewer, Reviewer

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Department

2010	Hope Lodge Dinner
2011 - Present	Radiation Oncology Residency Candidate Interviews, Interviewer
2014 - Present	Departmental Consulting Group for Promotion, Member
2012	College of Engineering 10th Annual Research Open House, Judge
2009 - 2012	Medical Student Research Day, Judge
2009 - 2012	Capital Equipment Committee in Radiation Oncology, Member
2013 - 2014	Magnetic Resonance Advisory Committee, Member
2007 - Present	Medical Physics Residency Admissions Committee at UIHC
2007 - Present	Medical Physics Residency Curriculum Committee at UIHC