

innovation

AAPM 2014



Johns Hopkins University The I-STAR Laboratory www.jhu.edu/istar

Slide Materials Contributed by TR Mackie, R. Mohan, M Kessler, K Brock DA Jaffray, JM Boone, GH Chen, R Jeraj W Kalender, J Thrall, M Kalutkiewicz

Funding Support National Institutes of Health Department of Defense Elekta Oncology Systems Siemens Healthcare Carestream Health

Disclosures

Advisory Board, Carestream Advisory Group, Siemens XP Advisory Group, Siemens AX Licensing Agreement, Elekta





Innovation

A <u>change</u> that brings better performance¹ A <u>process</u> that combines new ideas or methods c.f., invention – creation of the idea or method c.f., improvement - doing the same thing better (versus doing something different)



1. ME Porter, The Competitive Advantage of Nations (1990). 2. JL Bower and CM Christensen, Disruptive Technologies: Catching the Wave (1995)

Medical Physics Innovations

Changing the Status Quo ... is what we do!

AAPM 2014 (Austin TX) 1,770 proffered presentations 330 Young Investigator submissions ~2,400 meeting registrants ~970 technical exhibitors

President's Theme

2014

AAPM 2

.....

ent's Theme Innovations in Imaging Dosimetry (SUN-E) Research and Innovation in Rad Onc (MON-E) Innovation in Medical Physics Add Engineering (TUE-C) Innovation in Medical Physics and Engineering (TUE-C) Innovations in Medical Physics and Engineering (TUE-C) Innovations in Medical Physics and Engineering (TUE-C) Innovations in MUTasound Technology (WED-A) Innovations Multi-Energy CT (WED-E) Innovations in PET Instrumentation (THU-A)







MaxAMPIRysics Innovations		
Co-60	IMRT VMAT Webb C Yu	"The increasing the for every innovation that will come in your lifetime are already
DSA Mistretta	3D Treatment	here ^s Bill Buxton Yaffe Boone
Spiral CT	CBCT for LGRT Jaffray Siewerdsen Wong	CT Image Guality and Doge G Chen McCollough
Tomotherapy Mackie	MRIgRT Lagendijk Faltone Dempsey Balter	Image Registration Brock L Dong







Innovation is a Necessity - not a Nicety

"The enterprise that does not innovate inevitably ages and declines. And in a period of rapid change... the decline will be fast." Peter F Drucker, Innovation and Entrepreneurship (1985)



"The first step in winning the future is encouraging American innovation." President Obama 2011 State of the Union Address



(Some of the) Key Areas of Innovation for Medical Physics







Physics of Cancer Mathematical models Biophysics Radiomics

Dose





Knowledge extraction

Image Analysis Segmentation

Registration



Predictive power from population data T McNutt (Johns Hopkins)



Measuring Innovation

Strategic Allocation of Resources¹ Priority to R&D with measurable return An expanded research mission : Advance scientific understanding Improve in human health

Drive economic growth

Many Potential Metrics – e.g., Patents Knowledge creation, translation, and economic potential Correlate with economic health Policymakers looking to patent activity for strategic allocation

C A mentioner and a	Things internet as primes
Science, Space, & Techn	notogy
Nume Abral Lingblable Nove Subcarathees Autorati	Ile Creatile
The Dante Oaks at Serie	Webcast
Subcommittee on Research & Technology Hearing - Policies In Spar Tennative Modical Breakthroughs from Laboratories In Patients Internet Annual Control (Control of the Statisty Ventors, 3C)	
Witnesses	Lating-
Or. Dasg Variant Transmit, Charman and Christmander Christ, 3 Using Variant Indian Special Concerns No., part Variant Language, Inc. Or. Data Transmit Apple Transmits and Carlos Fairs Frankess Language articles.	Legislation
Compared and make in the second second	- Alternative and the second second second
university of conference Polyteries, Polyteries, Polyteries of Chemical & Balancement of agreening: Statements of California, the forly: Polyteries Toppments of Engineering University of California, Boltman, Danitri, Vantania, Balanga California,	Baselings and Hannings
Dr. Hannik (Kennak, Drive ber Antonia (Larger with Art (OC) at the Salamin Collider of September 2019).	MARGE (
	Artesiste
	tonia Congress
encode() (see, marking, marking) (see	

Innovation... a Model Patents =? Creation of New Knowledge Bohr's Quadrant Pasteur's Quadrant Pasteur's Quadrant Basic Research Applied Research Translational Research NIDCD NI 8 NCCAM Edison's Quadrant ONING Forward Citations =? Consideration of Use

MJ Kalutkiewicz and RL Eh Nature Biotech (2014)

Donald E. Stoke 199

JD Zeints and JP Holdren, Memorandum for the Heads of Executive Departments and Agencies. (Washington, DC, June 2012



5





