Assessing Patient Reported Outcomes in Radiation Oncology

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visiontree optimal care™

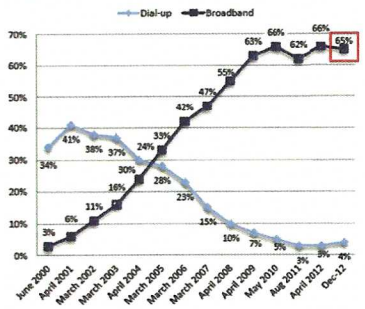
BACKGROUND

- The success of radiation therapy is judged by the balance achieved between tumor control and avoidance of side effects
- The field is moving rapidly toward assessing side effects and quality of life directly from patients via "patient-reported outcomes" (PROs)
- Technology can be used to automate the administration of surveys at specific time intervals without the need for in-person visits
- Electronic administration of QOL surveys has been associated with a **40% improvement in data collection rates** for radiation oncology patients[1] (increase from 52% to 90% of surveys completed at 6 month time point, and from 36% to 82% at 1 year time point)

[1]Movsas B, et al: Electronic Web-Based Technology Significantly Improves Quality of Life (QOL) Data Collection: Analysis of RTOG 0828. Int J Radiat Oncol Biol Phys 81(2S): S111, October 2011.

- Cancer patients are increasingly likely to be active online and to have broadband access at home

Broadband and Dial-Up Adoption, 2000-2012
% of American adults who access the internet via dial-up or broadband, over time



Source: Pew Research Center's Internet & American Life Project surveys

Demographics of Internet Users
% of American adults within each group who use the internet

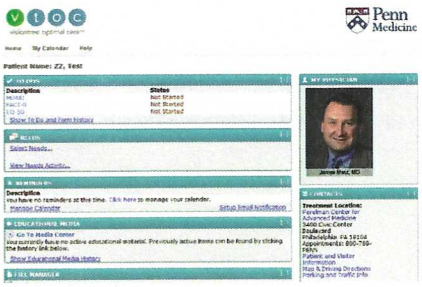
	All adults ages 18+	81%
a	Men (n=1,054)	80
b	Women (n=1,207)	82
	Race/ethnicity	
a	White, Non-Hispanic (n=1,632)	84[b]
b	Black, Non-Hispanic (n=249)	73
c	Hispanic (n=211)	74
	Age	
a	18-29 (n=335)	94[bcd]
b	30-49 (n=585)	89[cd]
c	50-64 (n=689)	77[d]
d	65+ (n=610)	54
	Education attainment	
a	No high school diploma (n=209)	51
b	High school grad (n=662)	74[a]
c	Some College (n=598)	89[ab]
d	College + (n=770)	95[abc]
	Household income	
a	Less than $30,000/yr (n=645)	67
b	$30,000-$49,999 (n=396)	86[a]
c	$50,000-$74,999 (n=316)	90[a]
d	$75,000+ (n=515)	98[abc]

Source: Pew Internet Post-Election Survey, November 14 – December 09, 2012. N=2,261 adults ages 18+. Interviews were conducted in English and Spanish and on landline and cell phones. Margin of error is +/- 2.3 percentage points for results based on all adults.

Note: Columns marked with a superscript letter ([a]) or another letter indicate a statistically significant difference between that row and the row designated by that superscript letter. Statistical significance is determined inside the specific section covering each demographic trait.

TECHNOLOGY

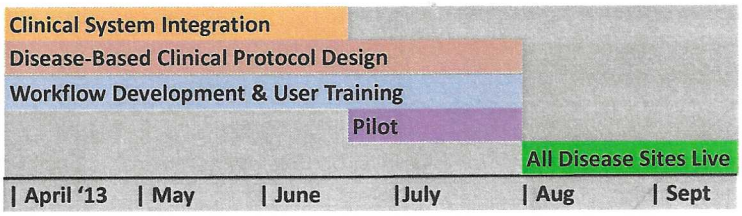
- **VisionTree Optimal Care™ (VTOC)** is a software-as-a-service (SaaS), cloud-based, modular, interoperable patient/provider portal system
- Extensive library of over 200 validated oncology and general-purpose survey instruments (e.g. EPIC, IIEF, EQ5-D, SF-36, FACT-G, VAS, MDASI, etc.)
- Configurable clinical protocol templates assign survey instruments and timing of administration based on diagnosis
- Electronic reminders and notifications sent to patients via e-mail and SMS text messaging



- Optimized for iPad and tablet PCs
- Web services API, HL7 interface capability for integration with existing clinical systems
- 256 bit SSL encryption, SAS-70 compliant data center, HIPAA and 21 CFR Part 11 compliant

PENN RADIATION ONCOLOGY PROJECT PLAN

- Plan to implement systematic collection of patient-reported quality of life surveys for all patients treated in the department
- Implementation Timeline:



- Disease site teams will select the surveys and time intervals to be associated with each set of diagnoses
- Proposed plans for integration include:
  - Transfer of ADT information from Aria to VTOC via web services
  - Transfer of completed survey documents from VTOC to Epic
  - Context aware hyperlink (pseudo "single sign on") from Epic to VTOC
  - Incorporation of survey data into Penn Data Store
- Workflows will emphasize MyPennMedicine as the primary patient portal for most clinical functions, with VTOC as an adjunct tool for RadOnc quality of life survey collection

Penn Radiation Oncology

Penn Medicine