TG - 262

AAPM Task Group 262
- IT considerations in the electronic chart -

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MAYO CLINIC
Radiation Oncology

IT Infrastructure for Radiation Oncology

What is **IT**?

and

Why is **IT** so important?

E-Chart System/Environment

IT Infrastructure

All Clinical Tasks and Workflows

The 4 Main Pillars of IT infrastructure

Hardware Infrastructure Type and Design

- Physical and/or Virtual servers,
- Server network enablement,
- Internet connectivity,
- Firewall and security,
- Cloud-based deployment,
- High availability and redundancy systems,
- Networking,
- Data backups systems and processes,
- Performance,
- Information security,
- Test environments,
- Mobile Device Connectivity

Software supporting IT infrastructure

- Enterprise resource planning (ERP),
- Productivity applications,
- Operating system,
- Database management system (DBMS),
- Communications protocols,
- Anti-virus software,
- Compilers and
- Other development tools

Application Services

- Reporting,
- Mining and data analytics,
- Data and information exchange with other hospital-based systems and devices

Peopleware & Management Strategies

- Network, dbase and system administrators,
- Developers,
- Designers, and
- Generic end users with access to any IT appliance or service for maintenance and support

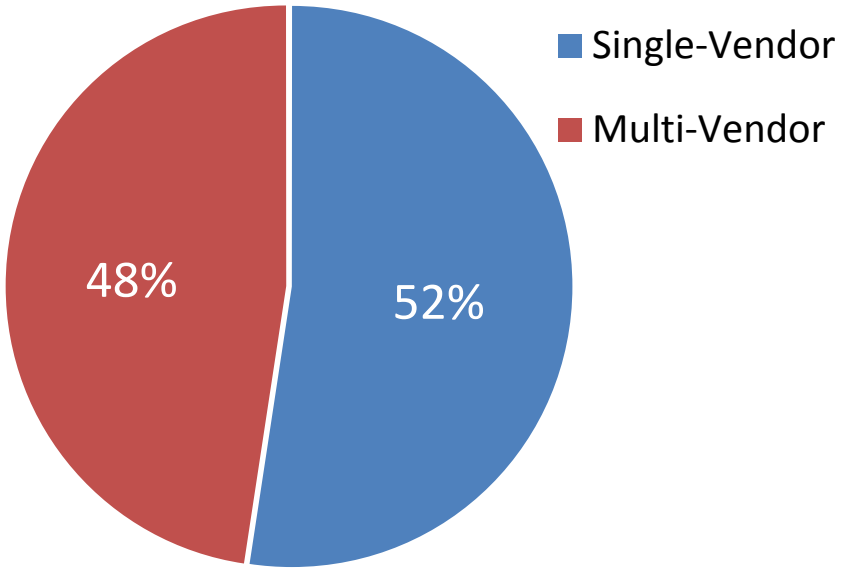
Mapping of Current IT infrastructure supporting the RadOnc e-chart environments

- 13 question exploring the IT infrastructure landscape across AAPM members
- ~ 415 participants

Type of Environment

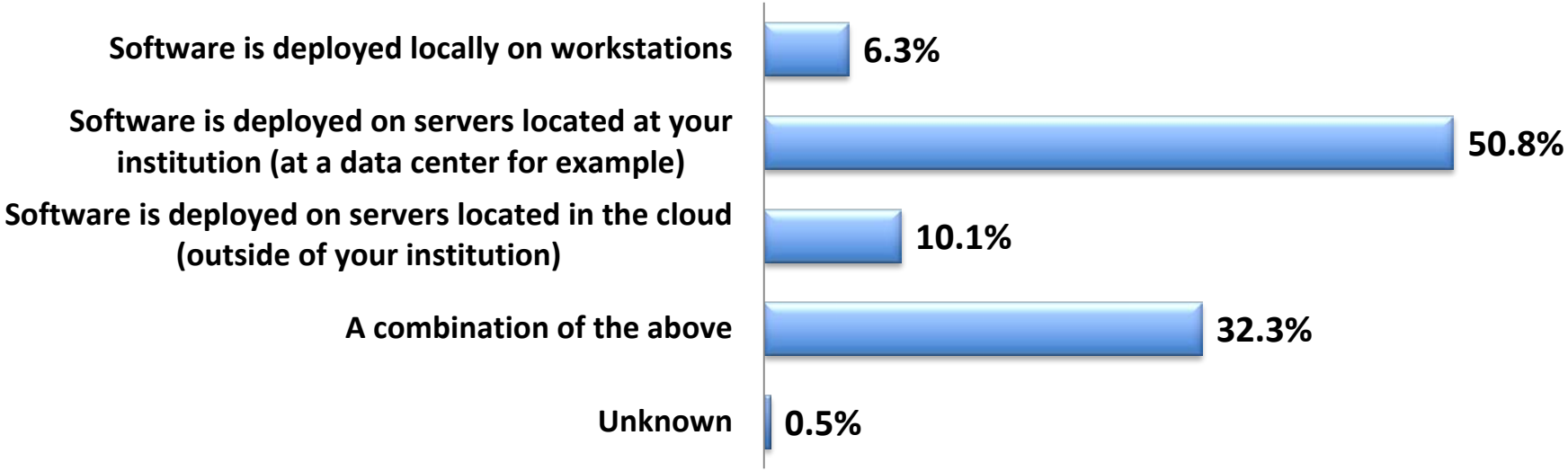
Single- vs. Multi-Vendor Environment

Delivery, Planning and E-chart environment are from the **same** or **different** vendors

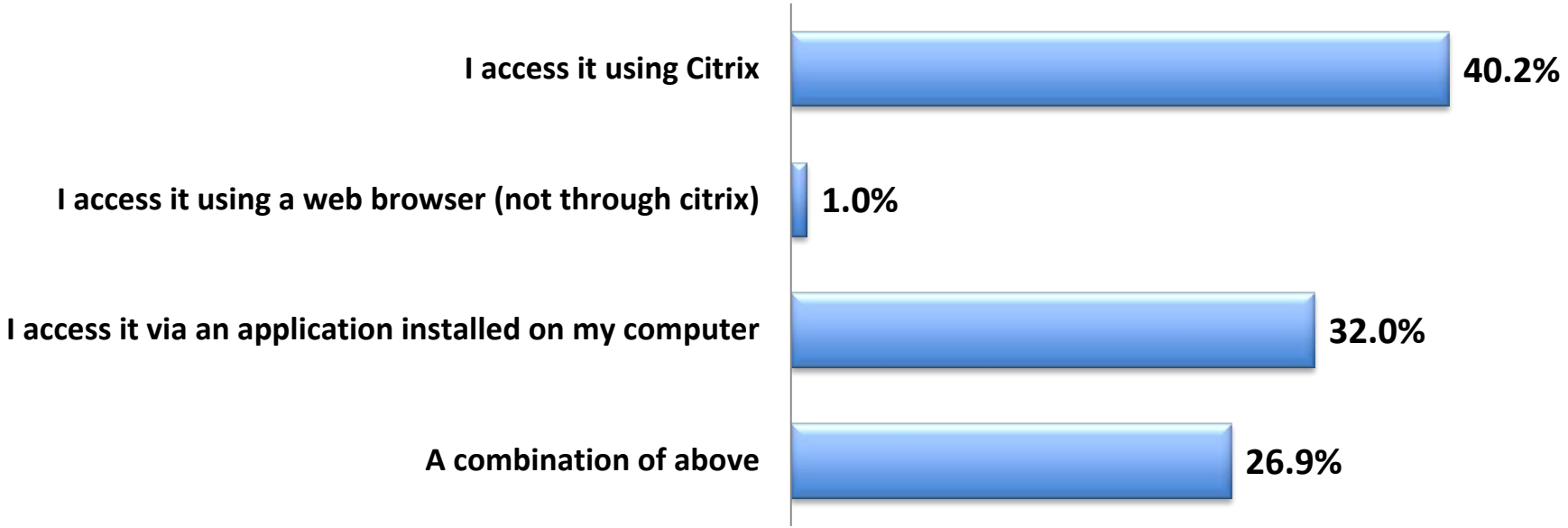


Deployment Strategy

Where is the e-chart environment installed?

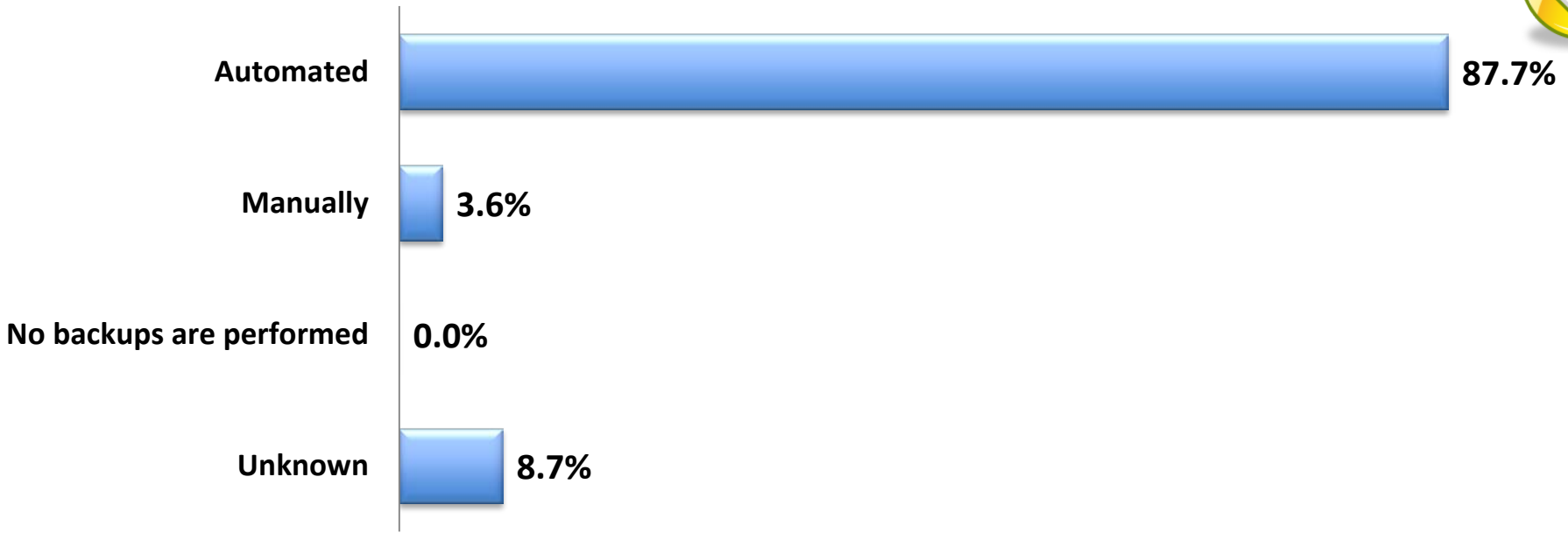


Accessing the e-chart system

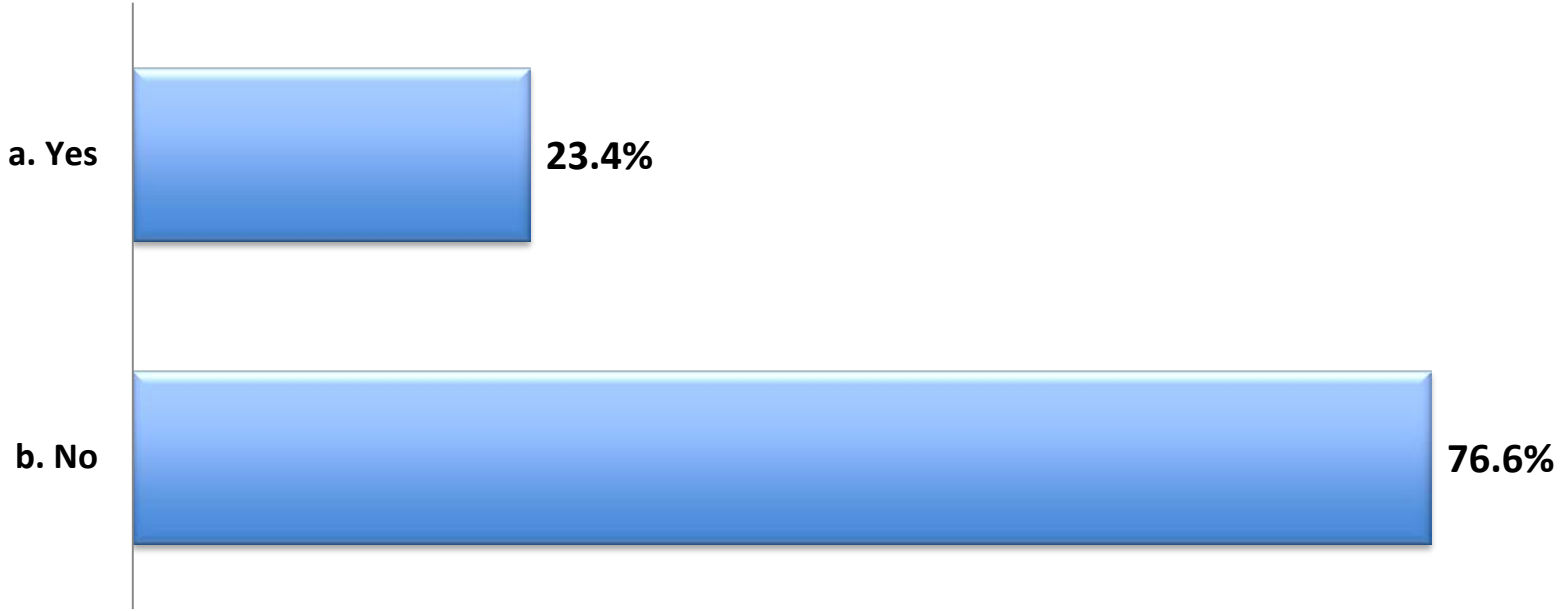


Utilization of test environments to validate upgrades

Database Backups



Smart Devices Access and Mobile Application



Information Security

Economical Motivation:

- Selling information:
  - Single Health Record: $1000 vs. Credit Card: $ 0.50
  - More than 113 million personal health records were compromised in 2015
- Ransomware: Threatens to publish the victim's data or perpetually block access to it unless a ransom is paid.

Motivation to Cause Harm:

- Hacking medical devices to cause harm.

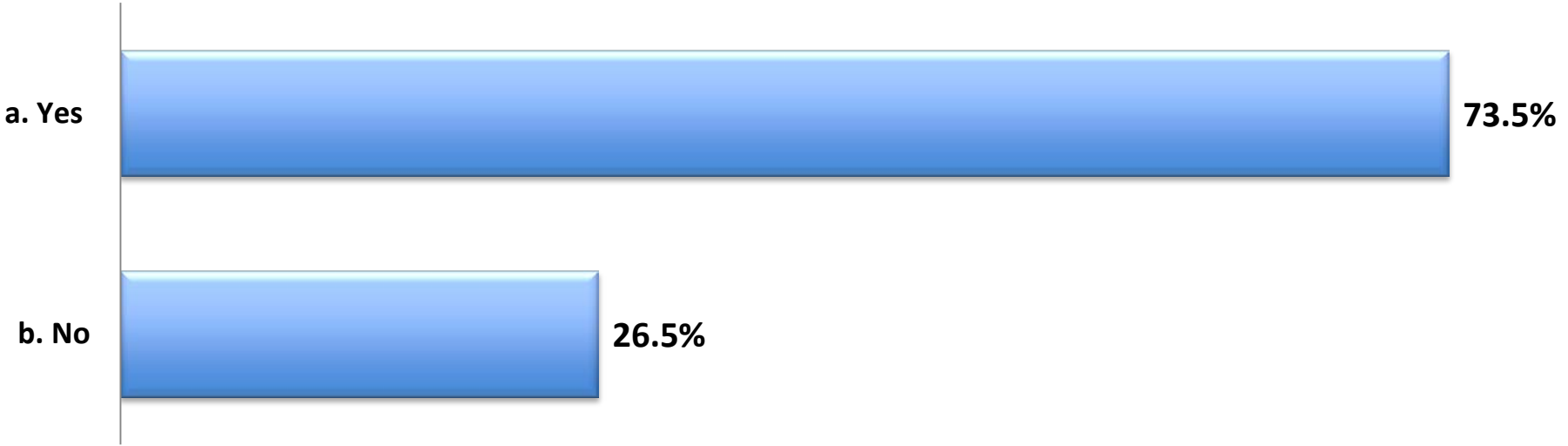
Role of Clinical Team and Medical Physicists

Data Mining


25%
1101 0010 1100
1101 0010 1100
1101 0010 1100


a. Yes
41.6%
b. No
58.4%

Custom Reports



What's the role of Medical Physicists in IT?

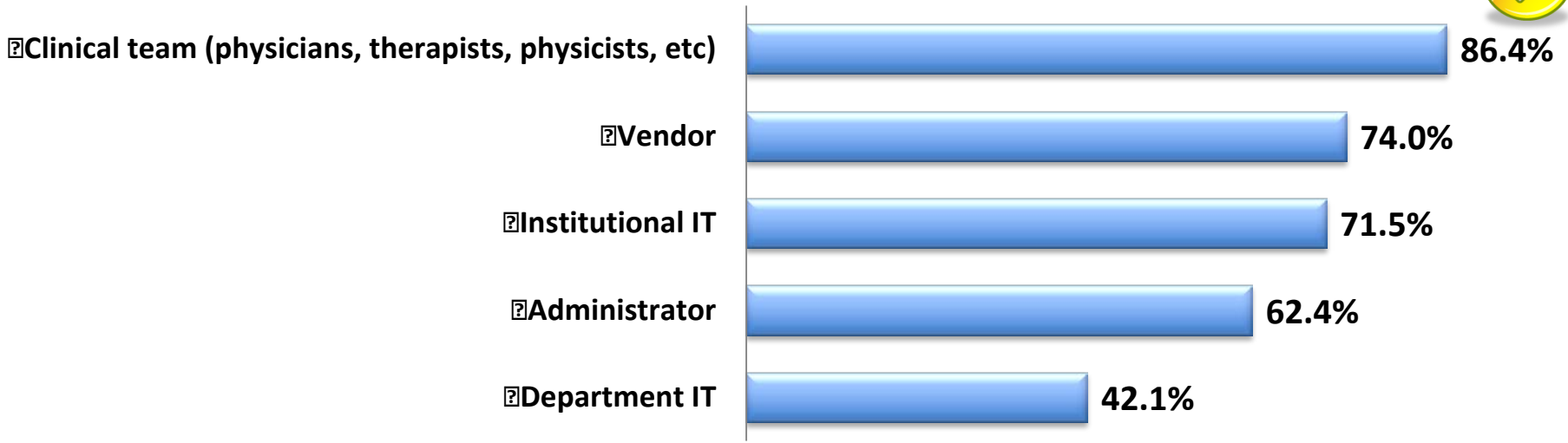
- WGIT - "*The creation of a robust IT infrastructure requires **input from the medical physicists**, since they have the best understanding of the nature of the data and its flow through clinical processes*"
- "*…planning requires **collaboration** among the medical physicists, equipment service engineers, RO IT staff, and hospital or clinic IT staff*"

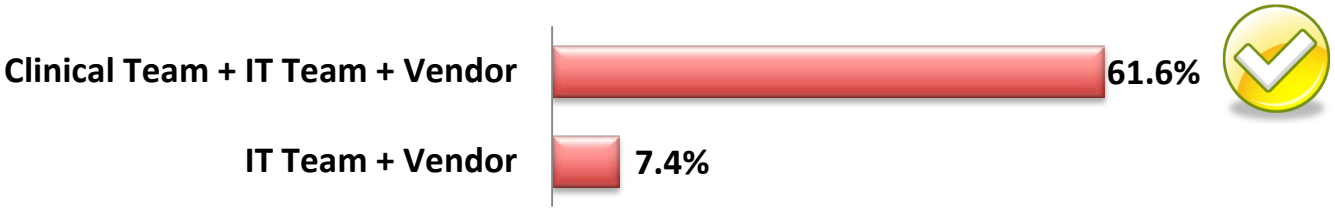
Balance between Clinical Practice needs and IT Infrastructure needs.

Siochi, R.A., et al., *Information technology resource management in radiation oncology.* Journal of Applied Clinical Medical Physics, 2009. **10**(4): p. 16-35.

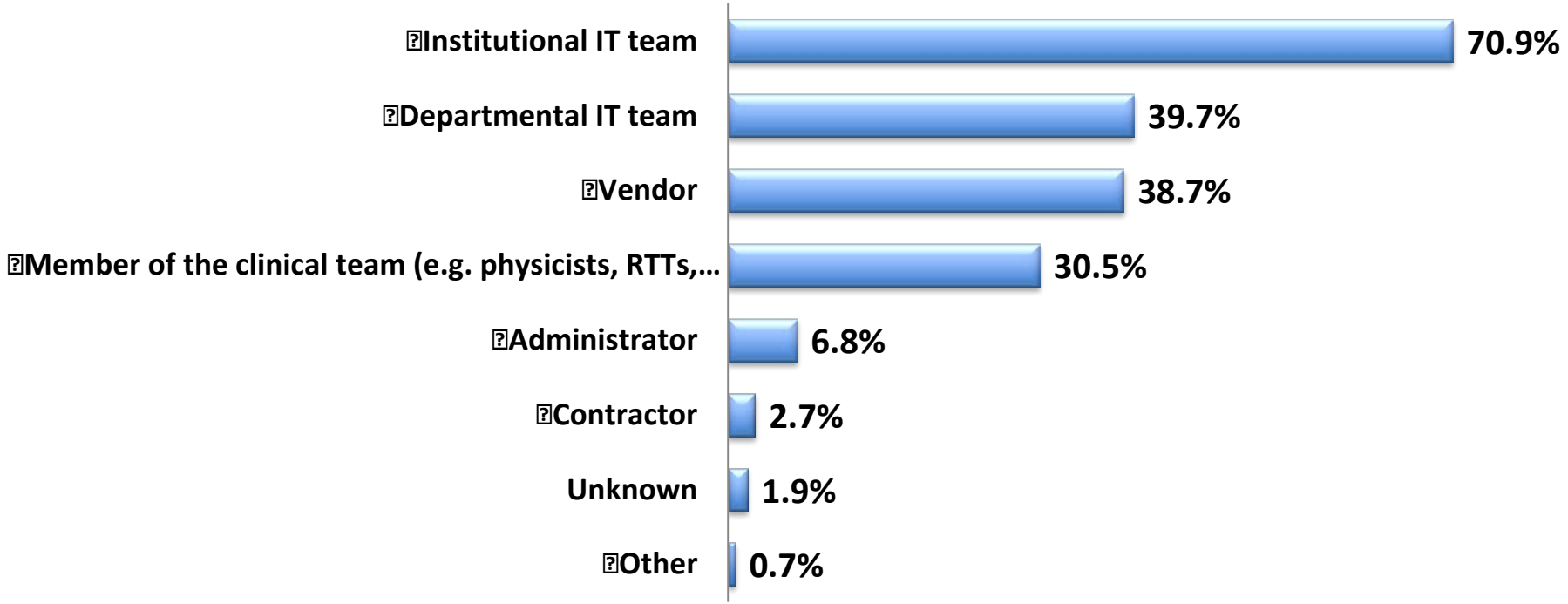
Siochi, R.A.C., C.D. Brack, and C.G. Orton, *The Chief Information Technology Officer in a Radiation Oncology department should be a medical physicist.* Medical Physics, 2009. 36(9): p. 3863-3865.

Discussion about the design of RO-EMR environment IT infrastructure (i.e. server configuration)

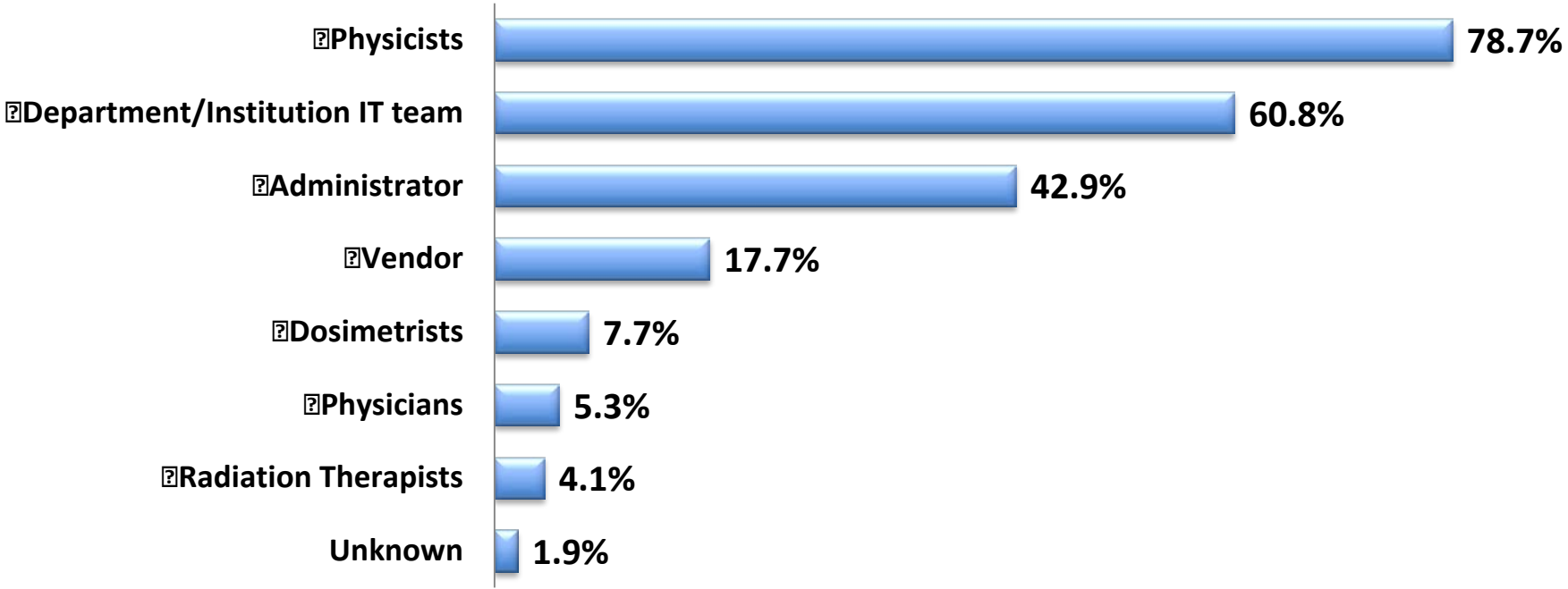




Supports the RO-EMR IT infrastructure (i.e. servers, database backups, database performance checks, etc.)



Administrator Level Rights for e-chart Systems



Recommendations

- Guidelines on the process of developing an IT infrastructure;
- Provide a basic knowledge to be able to ask the right questions and actively participate on the discussion

Acknowledgements

- Mark Parry
- TG 262 Members

AAPM Community

Thank you!!