A Survey of the Physics Initial Plan Review Process

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Survey Goals

- Which treatment plan elements are being checked
- Variation in plan checking practice

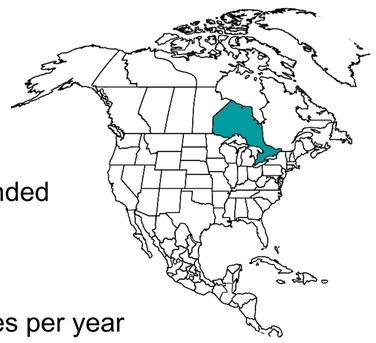
Survey Method

- Conducted in February and March 2015
- All Ontario, Canada Cancer Centers[1]
- One response per center (15)
- Physicists completed survey in a group setting
- For each checking item each group indicated: "All", "Most", "Some", or "None" performed check

Centre Characteristics

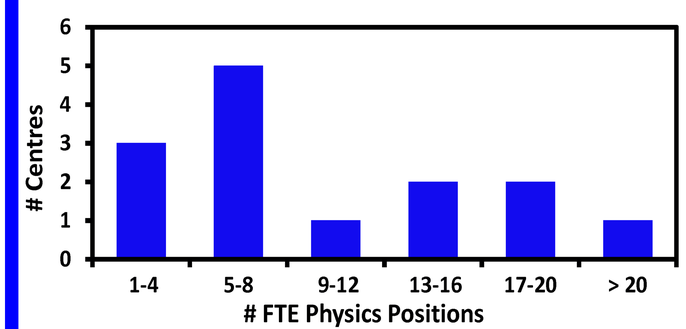
Ontario Canada

- 15 Cancer Centers
- 380,000 sq. mi
- 13.6 million people
- 100% government funded



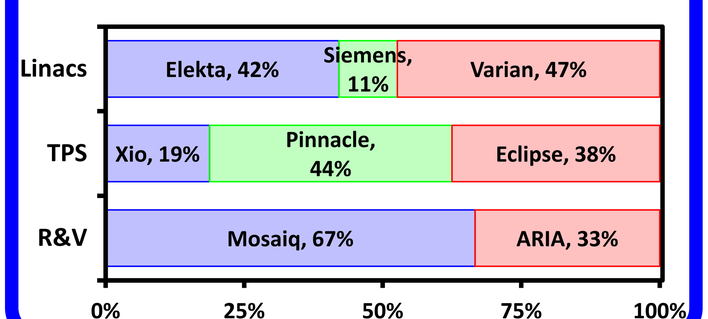
Center Size

- 650 to 5600 new cases per year
- Median of 8 physicists per center
- Between 3 and 26 physicists per center

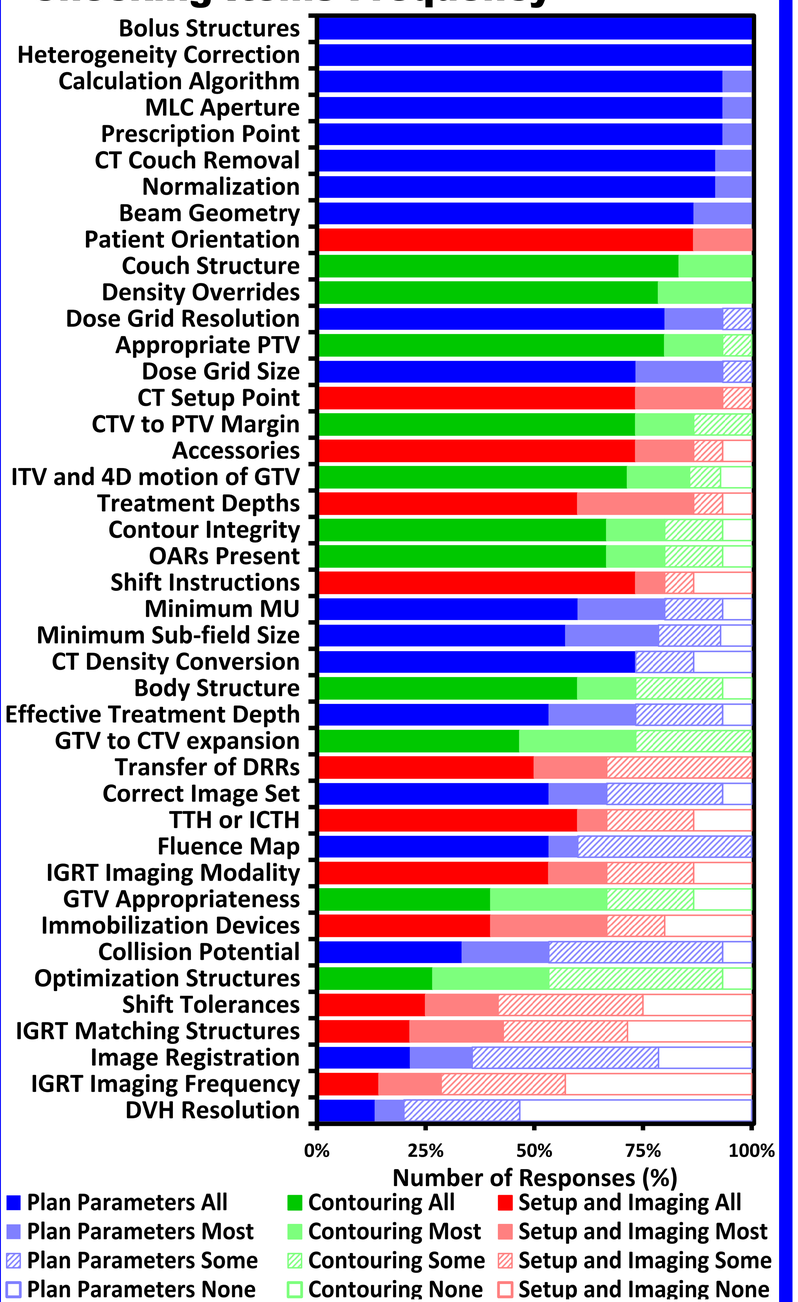


Software and Linacs

- 6 centers use a single vendor
- 3 centers with linacs from multiple vendors
- 6 with TPS and R&V from different vendors.



Checking Items Frequency



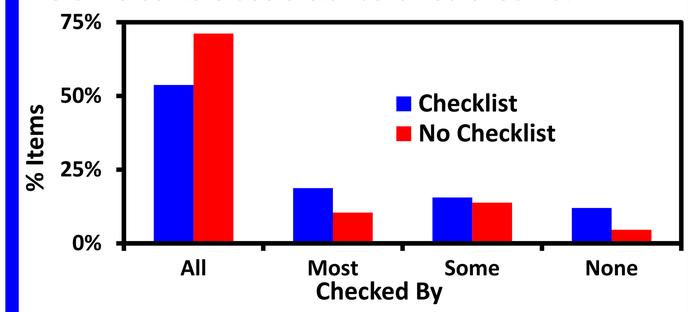
- Checking Items in figure above sorted by checking probability:

$$\overline{P}_{\text{checking}} = \#All + 0.75 \times \#Most + 0.25 \times \#Some$$

- Solid bars indicate "All" frequency. Empty bars indicate "None" frequency.
- Only bolus and heterogeneity checked by "All" physicists at all centers
- Only DVH bin resolution not checked by any physicists at more than half the centers.
- 37 of 42 items checked by "All" or "Most" of the physicists at more than half of the centers
- Setup and Imaging the least checked category
- Plan Parameters the most checked category
- Sizeable degree of variation both within and between centers

Checklist Impact on Practice

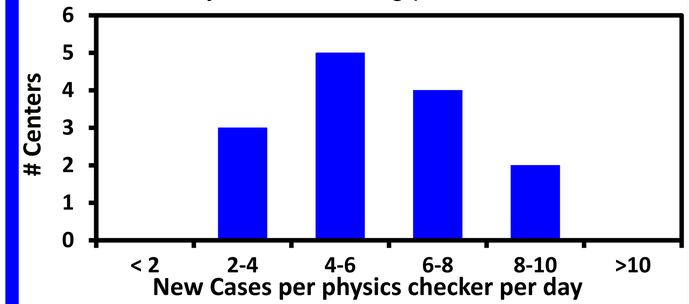
- 8 of 15 centers use a standardized checklist.



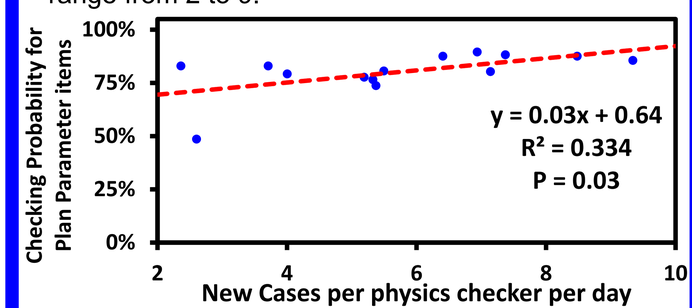
- Centers with a standardized checklist report:
  - Less items checked by "All" physicists
  - More items checked by "Most", "Some" or "None" of the physicists
- Standardized Checklists may:
  - Enhance awareness of existing practice variation
  - Document items that do not require checking

Workload Impact on Practice

- Workload may affect checking practice



- Number of new cases per physics checker per day range from 2 to 9.



- Percentage of items checked increased slightly with workload rather than decreasing.
- An increase of 3.5 new cases per day corresponds to a 10% increase in the average checking probability.

Acknowledgements

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References

1. Cancer Care Ontario. *Current Practices of Medical Physics External Beam Plan Checking*.; 2016. https://qspace.library.queensu.ca/handle/1974/15407.
2. Kim L, Chen T, Rong Y. A standardized checklist is optimal for patients' chart check. *J Appl Clin Med Phys*. 2017;18(1):5-8. doi:10.1002/acm2.12030.