Are there any types of plans that you feel can never become mostly automated? (> 95% of cases)

Head and Neck (11):

- Head and Neck; too many compromises with OARs
- Head and neck
- H and n
- Head and neck
- HN
- H&N, Breast (2)
- Head & Neck
- Head and necks, complex or irregular anatomy/tumors (2)
- Complex head and neck cases.
- Head and neck, IMRT breast (2)
- H&N

Breast/CW (13):

- Breast
- H&N, Breast (2)
- Breast tangents
- Breast
- Breast
- Prostate, breast (2)
- "Yes. Breast plans for example vary drastically from clinic to clinic. Each physician has their own specific requirements and preferences regarding these. (2)
- Breast 3D, CSI, Proton world will take longer.
- Head and neck, IMRT breast (2)
- Postmastectomy chest wall could be the last to go, but even this will likely become automated.
- VMAT Breast
- Probably not. Maybe a super complex H&N will need more human intervention, but I think we'll eventually get there. (2)
- It depends on the physician requirements. For example, my clinic pays attention to 103% on breast plans and we use Clear Check and it cuts my time down but I still have to manually adjust to achieve the clinics requirements (2)

Yes (3):

- Yes
- yes
- Yes, Near optics

No (34):

- No
- No
- No?
- No
- No
- No
- No
- No
- No
- None
- None
- No

- No
- Not sure
- Not sure
- n/a
- N/a
- No
- no
- No
- No
- No
- No
- No
- No.
- No
- no
- No
- No
- no
- Probably not. Maybe a super complex H&N will need more human intervention, but I think we'll eventually get there. (2)
- All of them
- No although I fear for the accuracy of those plans based on the poor job done by autocontouring. (2)
- Some brachytherapy plans requiring physical placement will be more difficult to automate, but I think everything will EVENTUALLY be automated. (2)

Prostate (2):

- Prostate, breast (2)
- prostate

SRS/SBRT (5):

- SBRT plan-related
- 3D, SBRT, SRS (2)
- SBRT and Protons (2)
- SRS
- Stereotactic Radiosurgery

Protons (2):

- SBRT and Protons (2)
- protons/ions

3D (8):

- 3D, SBRT, SRS (2)
- weird/complicated 3D plans. (2)
- 3d plans
- Palliative 3D
- Current billing practices would make 3D/palliative planning difficult for a computer
- Whole brain.
- Palliative
- Cases where the physician does not draw a PTV, which is probably ~5%. Neural networks may some day be able to automate target delineation, but I have little confidence that they will be used clinically due to liability and protectionism. (2)

Atypical/uncommon cases/circumstances or requiring human input (27):

- extremely uncommon cases (ex: complex re-treats requiring human input)

- There will always be 'nonstandard' patients for which a lot of comparative data does not exist. 500 pound patients, patients with missing or removed organs, patients who can't tolerate a standard supine/prone position, patients who can't raise their arms
- Simple plans with unexpected setups, weird electrons, etc
- Any non-standard site.
- Total body treatments (eg TBI, TLI)
- Retreat
- plans with artifacts
- Yes-TBI, total skin,
- Anything non-standard, process improvement (2)
- those with couch kicks
- CSI, VMAT TBI or TMI
- One example: pacemakers and ICD plans often require a judgment call by MD or physicist.
- Whole Body RT, Emergency Setup and Treat, LDR Brachytherapy
- Plans requiring human judgement (e.g., discerning what to make of a metallic artifact). (2)
- Cases without clearly delineated target volumes such as TBI/TSET using traditional techniques
- Retreats
- Cases where the physician does not draw a PTV, which is probably ~5%. Neural networks may some day be able to automate target delineation, but I have little confidence that they will be used clinically due to liability and protectionism. (2)
- Head and necks, complex or irregular anatomy/tumors (2)
- weird/complicated 3D plans. (2)
- Complex plans with multiple nearby OARs and large tumor volumes would be difficult to automate
- All planning techniques and disease sites have specific caveats; therefor automated planning is irresponsible and does not present the patient with plans that have been developed using all relevant information and considerations.
- Lung Static IMRT, due to challenge of meeting V5 with Arc planning
- With machine learning on the horizon, I feel that most plans will eventually be able to be automated. The more difficult cases may be those where there is a direct conflict between the target coverage goal and OAR sparing (overlap, etc.) and that require significant dialogue between the planner and physician.
- Some brachytherapy plans requiring physical placement will be more difficult to automate, but I think everything will EVENTUALLY be automated. (2)
- No although I fear for the accuracy of those plans based on the poor job done by autocontouring. (2)
- Contouring
- Patient Positioning

Physician differences (3):

- It depends on the physician requirements. For example, my clinic pays attention to 103% on breast plans and we use Clear Check and it cuts my time down but I still have to manually adjust to achieve the clinics requirements (2)
- I also believe plans that require volumes such as IMRT will only be able to reach a certain level of automation due to the fact that the quality of these plans greatly depends on the physicians target volumes. I have seen physicians that draw very well, and others where it seems it may have been rushed."
- "Yes. Breast plans for example vary drastically from clinic to clinic. Each physician has their own specific requirements and preferences regarding these. (2)

Other (3):

- ~
- I think it depends on the quality of the dosimetrist. Sure, a computer can create better plans than some dosimetrists, but I think a good dosimetrist still will have a role in creating the best plan.
- Automation will allow us to implement even more conformal therapy allowing for realtime adaptive radiation therapy. Automation will not replace experts but will assist us in being more detailed and accurate than we currently are.