

Implementation Science to Explore and Expand the Therapist-Led Model for Online Adaptive Radiotherapy

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ABSTRACT

Purpose: Online Adaptive radiotherapy (oART) is resource and time-intensive, requiring dosimetrists, physicist, and physician involvement at each adapted fraction. The therapist-led adaptive workflow has been shown to reduce physician console-time¹. This study evaluates stakeholder perspectives on feasibility, risks, and implementation requirements for a US-based model that includes therapist-altered target structures.

Methods: Semi-structured interviews were conducted with 16 stakeholders (5-therapists, 6-physicists, 5-physicians). Thematic Analysis used a structured codebook targeting clinical impacts(AQ1), feasibility(AQ2), and implementation requirements(AQ3). Each excerpt received at least one code with optional additional codes where warranted. Valences were assigned to applicable excerpts to quantify drivers and barriers discussed. Themes were quantified using unique participant counts, valences, and co-occurring code relationships.

Results: Four themes were identified: 1. Physician review was the top proposed safeguard (n=11). However, 5 of the 11 participants who proposed it raised doubts about its rigor. Role growth and professional development were spontaneously raised as positive outcomes and drivers of therapist-led adaptive models (n=12). Departmental culture (n=14) and physician support were seen as central to feasibility (n=10), with a few participants (n=3) noting stronger physician–therapist trust in smaller/community clinics. Participants propose a dedicated adapter role (n=8) as a means of improving feasibility (n=6) offering benefits such as standardization of care and improved workflow logistics.

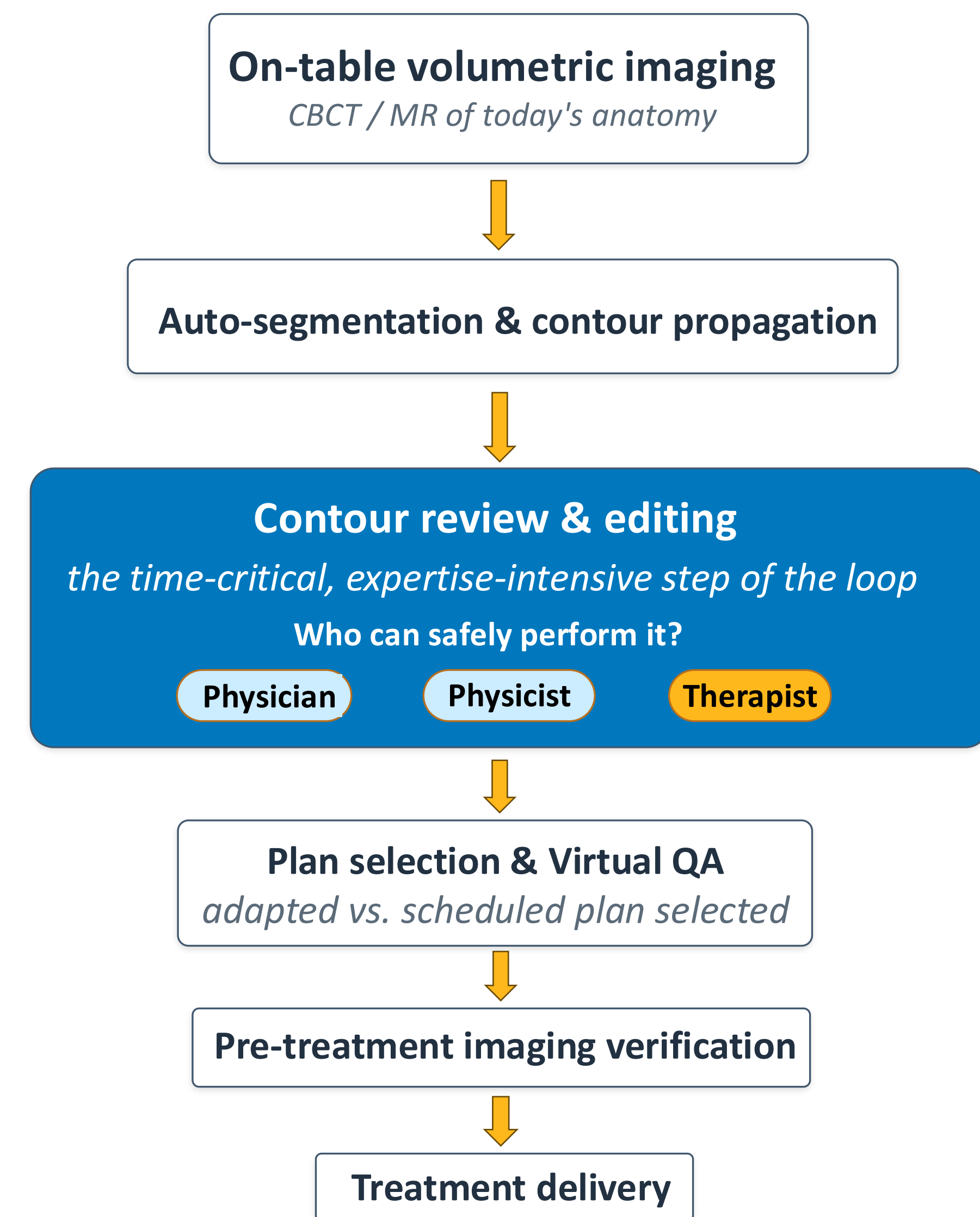
Conclusion: Our analysis suggests that therapist-led oART is facilitated by rigorous supervision checkpoints, positive cultural shifts, and a potential novel adapter role which can offer career growth opportunities for therapists. Future work will include additional interviews to confirm thematic saturation and develop a standardized training framework that addresses identified concerns.

CONTACT

INTRODUCTION

Online Adaptive Radiotherapy (oART) offers substantial patient benefits but it is a resource-intensive treatment

- Physician time
- Physics time



Purpose: Utilize Thematic Analysis to evaluate barriers and drivers for a US-based therapist-led online adaptive model with *therapist-altered target structures*.

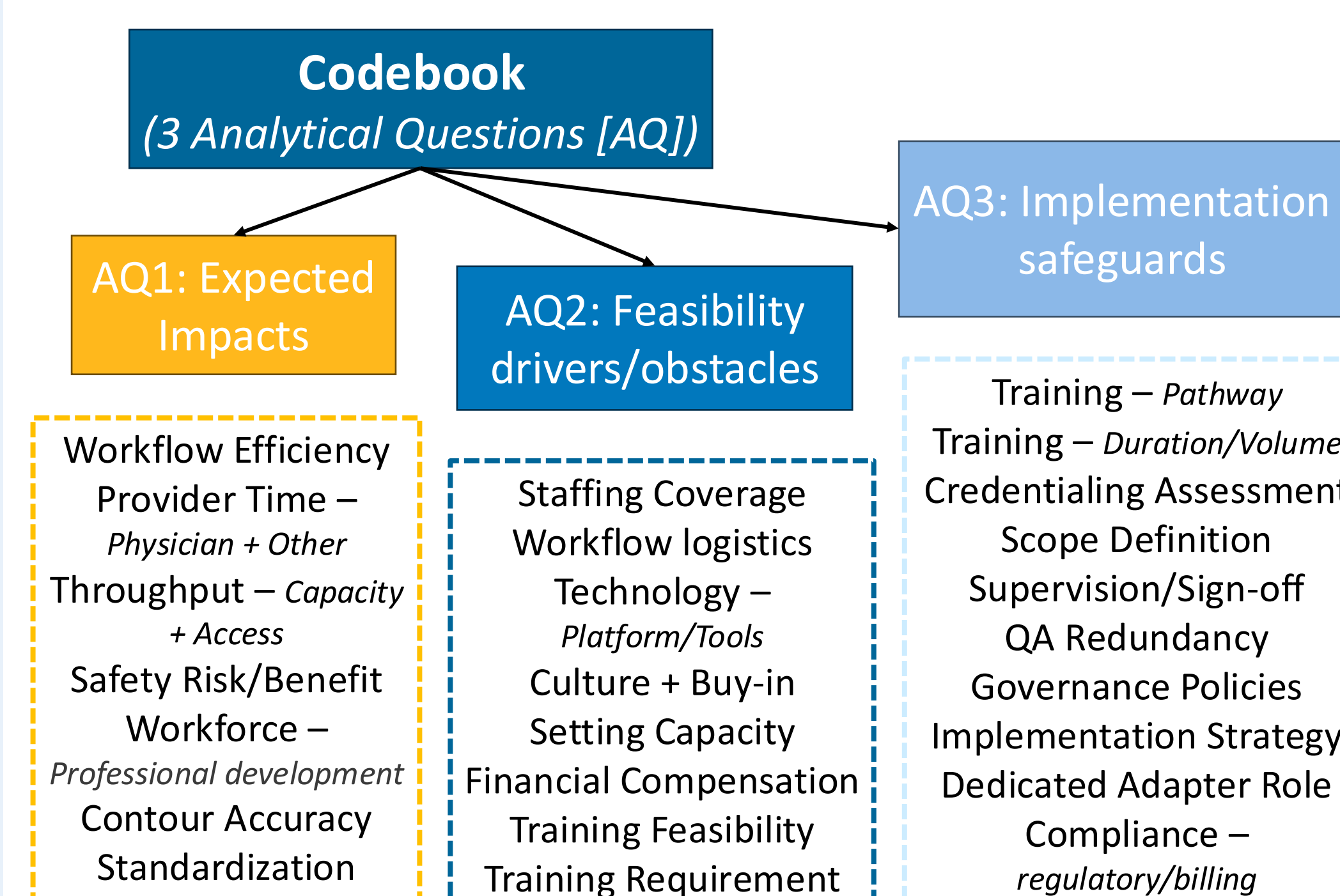
METHODS AND MATERIALS

Sample: 16 semi-structured interviews to identify barriers/facilitators for therapist-led oART

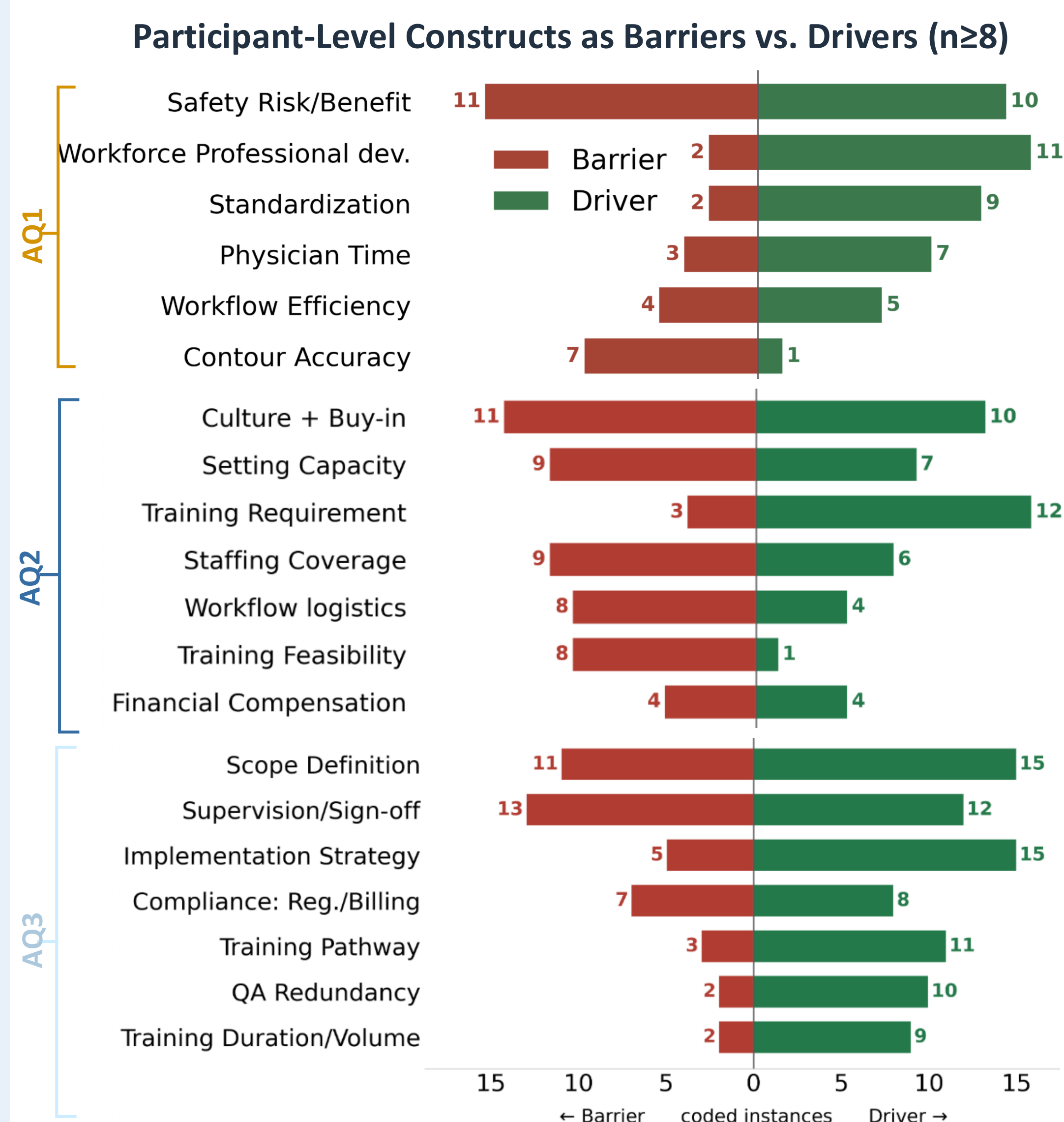
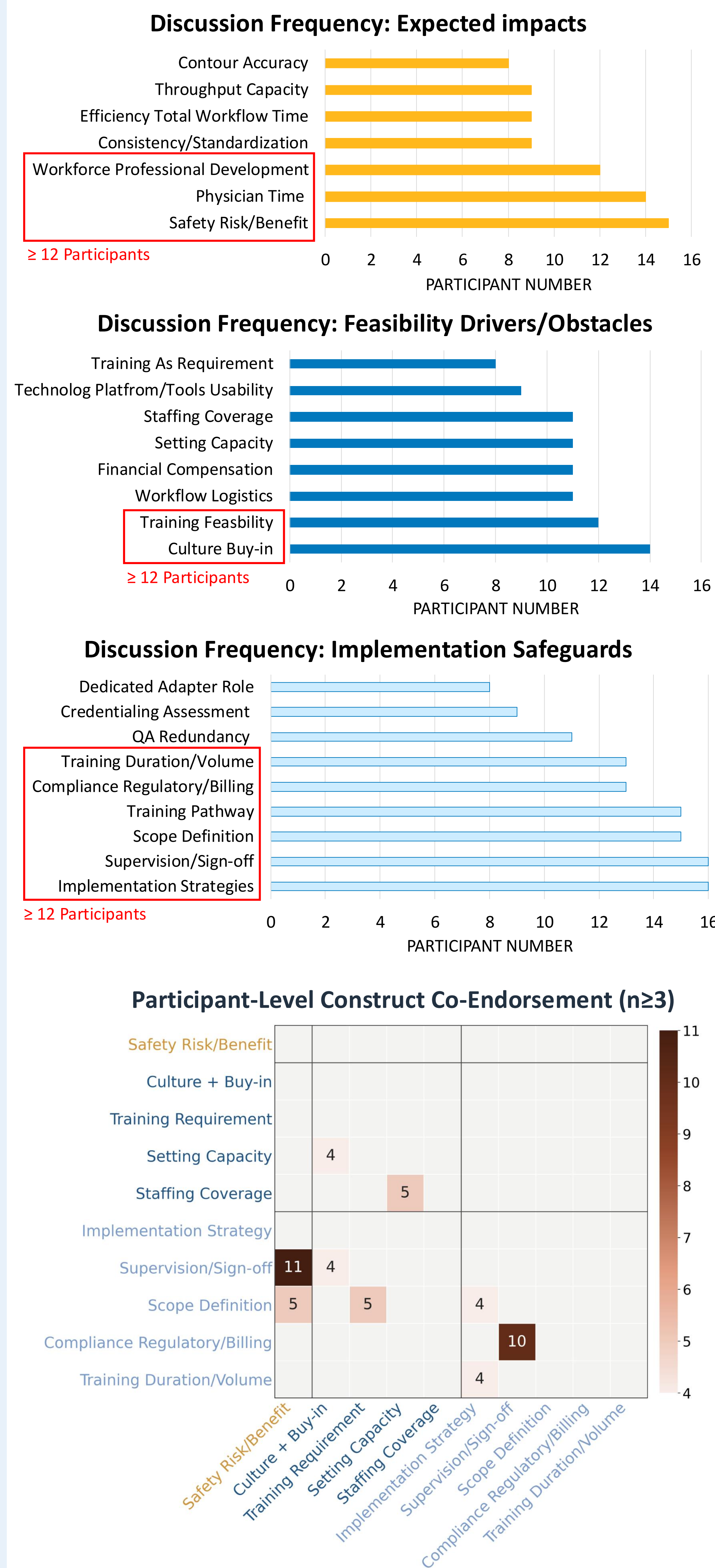


Study Design: Qualitative framework analysis^{2, 3}

- Step 1:** Nvivo transcription and manual verification
- Step 2:** Familiarization with the interviews
- Step 3:** Initial Coding: inductive and deductive
- Step 4:** Analytical framework development
- Step 5:** Recoding with developed framework (inductive/deductive)
- Step 6:** Framework Matrix Charting
- Step 7:** Interpreting the data:
 - a. Observing coding relationships
 - b. Assigning Barrier/Driver labels
 - c. Generating concepts supported by multiple participants



RESULTS



DISCUSSION

Safety, Professional development, Training, Culture Buy-in, Compliance, Scope, and Supervision were discussed by almost all participants throughout the interviews (n ≥ 12).

Physician review was the top proposed safeguard (n=11). However, 5 of the 11 participants who proposed it, raised doubts about its rigor.

“...if physicians aren't actually checking if they're just doing a normal sign off and just doing like an image review and not doing a thorough image review, that's a slippery slope.”

“...and 90% of it looks good and we don't review that 10%, I do think that's where the errors can come. Um, and it's totally a possibility with something like this...”

Role growth and professional development were spontaneously raised as positive outcomes and drivers of therapist-led adaptive models (n=12).

“...there's not a lot of additional things that a therapist can do... This adds another level of education...”

“I think it also is good for the therapists to have this role...it gives them more of a sense of autonomy and, and sort of contribution to the care of the patient.”

Departmental culture (n=14) and physician support were seen as central to feasibility (n=10), with a few participants (n=3) noting stronger physician–therapist trust in smaller/community clinics.

“...here at a smaller center. I think it'd be easier to trust the therapist...”

“...a smaller clinic where a physician has been working with a therapist for 20 years ... I think you have already established that trust.”

Participants propose a dedicated adapter role (n=8) as a means of improving feasibility (n=6) offering benefits such as standardization of care and improved workflow logistics.

“...a dedicated position where we kind of solely focus on all the contours and then meeting with physics physicians on the back end...”

“...it's also really nice to have the same person there every day looking at the contours and knowing what is changing... it could be a different physician every day... It's different therapists every day. But the one thing that stays true for the majority of fractions is that [new role] is there.”

CONCLUSIONS

Our analysis suggests that therapist-led oART is facilitated by rigorous supervision checkpoints, positive cultural shifts, and a potential novel adapter role which can offer career growth opportunities for therapists.

Future work will include additional interviews to confirm thematic saturation and develop a standardized training framework that addresses identified concerns.

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