A Multidisciplinary Quality Initiative to Address Delays in Initiating Post-Operative Radiotherapy in Head and Neck Cancer Patients

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Background and Context for Change

- For advanced stage head & neck cancers (HNC), the timeframe in which treatment is provided is important, with prolonged care often associated with decreased survival[1].
- Various studies have demonstrated decreases in overall survival with a delay of initiating post-operative radiotherapy (PORT) > 6 weeks after the oncologic surgery[2, 3].
- The American College of Surgeons Commission on Cancer's (ACS/CoC) HNC quality metric mandates that PORT is initiated within 6 weeks (42 days) from surgery for patients with surgically managed squamous cell carcinoma (SCC).
- Canada-wide: 80% of oral cavity cancer patients waited >42 days to start PORT[4].
- The Odette Cancer Centre at Sunnybrook Health Sciences Centre is one of two tertiary institutions in the Greater Toronto Area responsible for treating patients with HNC.
- An initial needs assessment was performed to establish the baseline percentage of HNC patients starting PORT at the 42 day target and to identify possible factors impacting delays.
- This work revealed that in 2021 – 2022, only 43% of our patients met this metric and the root cause analysis suggested that having a follow up (FU) with the radiation oncologist (RO) ≤ 3 weeks (21 days) post-surgery supports timely PORT.

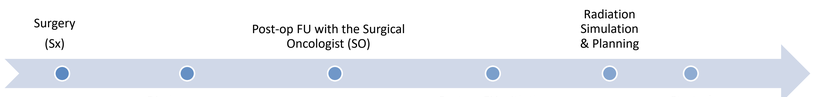
Aim Statement

- This quality improvement initiative aimed to increase adherence in starting PORT within 42 days from surgery from 43% to 70% by the end of 2024.

Family of Measures

- Measures included:
  1. Outcome = % of patients initiating PORT ≤ 42 days after surgery
  2. Process = % of patients having a post-operative FU with the RO ≤ 21 days after surgery
  3. Balancing = Radiation therapy (RT) planning workload = % of patients initiating PORT ≤ 42 days with a rushed planning process (< 14 days) from simulation to treatment
  4. The reasons for delay were also collected

Problem Characterization



# of Days	Sx → D/C	D/C → Post-op f/u with SO	Post-op f/u with SO → Post-op consult with RO	Post-op consult with RO → Sim	Sim → Treatment	Total # of days
Average	8	12	7	10	14	51
Median	5	10	7	7	14	43
Max	226	41	63	126	28	
Min	0	1	0	0	6	
Count	226	205	202	248	248	

Figure 1: Patient timeline from surgery to the start of PORT with accompanying table displaying the descriptive statistics for the number of days between each time point in 2021 – 2022, which identified that both the average and median number of days from surgery to the start of PORT was more than 42 days

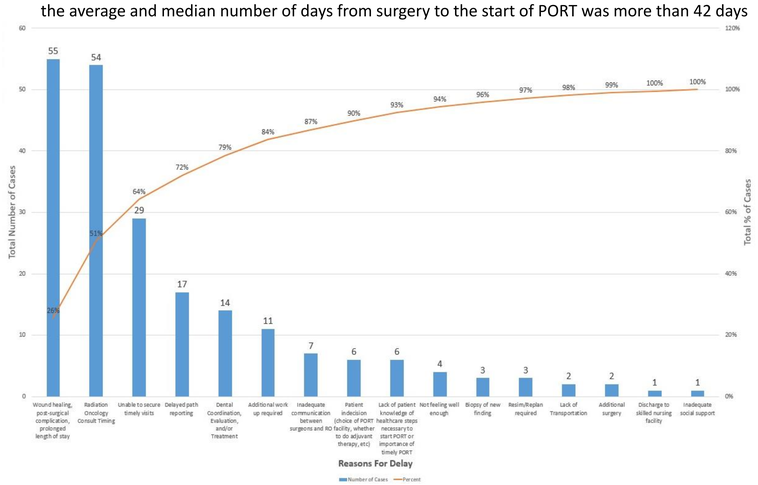


Figure 2: Pareto Chart of the "Reasons for Delay" in starting PORT in 2021 – 2022, which identified 77% of the recorded reasons corresponded to 5/16 subthemes (31%)

Intervention

- Change concept = reducing variation in the timing of the post-surgery FU with the RO by standardizing the process of booking the HNC patient into the RO's follow up clinic and standardizing the communication sent to the ROs indicating the ideal PORT start date
- Key drivers for success: meeting specific time points along the care pathway. This project focused on ensuring timely FU with the RO by the 3 week time point after surgery.
- Intervention:
  1. Circulation of an email communication of relevant PORT goal dates to the RO by the project lead.
  2. Upstream generation of an order for a 3-week post-op FU with the RO by either the surgeon or RO within Sunnycare, the Computerized Provider Order Entry system (CPOE).
- Although cited literature is for those with squamous cell carcinoma, all patients receiving PORT with a primary HNC diagnosis were included.
- Prediction – with the implementation of a standardized referral and communication process, we will improve the coordination of patient care and increase the percentage of HNC patients starting PORT within 42 days from surgery

PDSA Cycles

- Baseline data collection, root cause analysis and intervention planning was conducted in 2023, with a pilot involving one surgeon (physician champion) initiated in Q3 of 2023, and full implementation in 2024
- Each PDSA cycle was 3 months (1 quarter) in length with a progress assessment conducted at the end of each cycle which included:
  - Quarterly data analyses on the family of measures.
  - Visual display of the data using run charts and bar graphs
  - Discussion during the Tumor Board Business Meeting with stakeholders to share the progress and assess the impact of the intervention on each team member
- Lessons learned
  - Pilot – Technical issues with booking patients into the RO's clinics using CPOE were resolved.
  - Q1 – ROs like the email as it provided an opportunity for them to plan ahead. It was also identified that complex patients may still be inpatients after 2.5 weeks post-surgery so ROs agreed to see the patients on the ward.
  - Q2 – The email template to the ROs was modified to include more information in a chart form.
  - Q3 – RT workload was being affected and the team was advised that this was not sustainable.

Project Results

Measures	2024	2024 Q1	2024 Q2	2024 Q3	2024 Q4
HNC patients starting PORT ≤ 42 days from surgery	62/135 (46%)	12/26 (46%)	13/33 (39%)	16/37 (43%)	21/39 (54%)
HNC patients having FU with the Radiation Oncologist ≤ 21 days from surgery	54/135 (40%)	10/26 (38%)	14/33 (47%)	13/37 (35%)	17/39 (44%)
HNC patients meeting both targets	38/54 (70%)	7/10 (70%)	10/14 (71%)	7/13 (54%)	14/17 (82%)
HNC patients starting PORT ≤ 42 days but requiring a rushed planning of < 14 days	27/62 (44%)	4/12 (33%)	5/13 (38%)	10/16 (63%)	8/21 (38%)

Table 1: Proportion of HNC patients for each family of measures in 2024.

Care Co-ordination 41 (56%)	• 22 (54%) = Unavoidable delay (e.g. referred after external Surgery or waiting for final pathology results) • 19 (46%) = Potentially avoidable delay (e.g. delays in RO assessment referral post-surgery, delays in booking simulation or chemotherapy appointments)
Post-Op Issues 23 (32%)	• 18 (78%) = Unavoidable delay (e.g. post-op complications, delayed wound healing or required transfer to rehab) • 5 (22%) = Unavoidable delay (e.g. new finding or required additional testing or procedure)
Other 9 (12%)	• 6 (67%) = Unavoidable delay (e.g. patient indecision or patient request to delay treatment start) • 3 (33%) = Potentially avoidable delay (e.g. Dental Coordination and dental extractions)

Table 2: Thematic analysis of the reasons for delays in 2024 (n=73) which identified 51/73 (70%) of delays were unavoidable

Conclusions

- The QI initiative improved compliance to the ACS/CoC metric from 43% to 46%. This fell short of the 70% goal which can be attributed to 70% of delays being unavoidable.
- The intervention continues into 2025 but is labour intensive for the sole project lead.
- Stakeholder engagement and a dedicated forum to collect feedback and address concerns attributed to the project's success.
- Next steps are to investigate other sustainable interventions such as a dedicated patient navigator, automated FU booking, and patient care pathway visualization
- This project underscored the complex, multifaceted nature of care coordination for this patient population. Improving timeliness to PORT may require simultaneous, multidisciplinary interventions.

- Of the 135 patients, 62 (46%) began PORT ≤ 42, and 54 (40%) had a FU with the RO ≤ 21 days post-surgery (Table 1). Among patients with timely FU with the RO, 38/54 (70%) achieved timely PORT.
- The run chart (Figure 3) shows a positive linear trend for the total number of HNC patients meeting the 42 day target (blue dotted line) but this positive trend is more evident for those with squamous cell carcinoma (orange dotted line)
- An increase in RT workload was noted from Q1 to Q3, which was addressed before starting Q4, which resulted in a decreased RT workload by the end of Q4.
- Of the 73 patients with delayed PORT, the main causes were: care coordination (56%), post-op complications (32%), and other (12%). Thematic analysis (Table 2) revealed 70% of delays were unavoidable, including post-op complications and wound healing issues, delayed referrals from external surgeons, and patient-requested delays. Delays were classified as potentially avoidable if they could have been prevented through timely intervention.
- Sustainability – Clinical leadership champions, physician engagement, and a dedicated meeting time to collect feedback and address concerns maintained project momentum. A lack of organizational resources, such as a dedicated patient navigator and an automated process to book post-op FUs with the RO, were barriers to sustainability.
- Limitations
  - The reasons for delays were not always documented thus there was potential recall bias when engaging the ROs
  - There was limited access to external charts for patients referred by outside surgeons
  - Data collection and email communication of potential PORT patients to the ROs was done by one team member

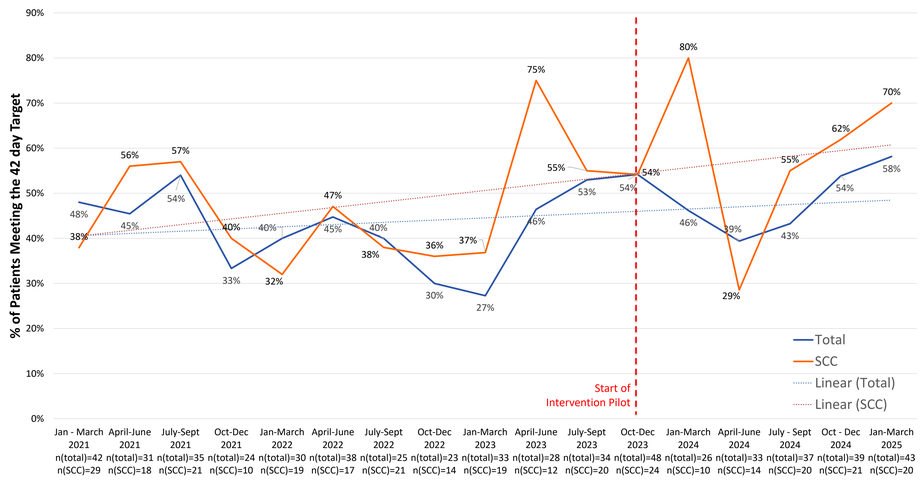


Figure 3: Run chart showing the percentage of HN Patients initiating PORT ≤ 42 days from surgery from 2021 to 2024.

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