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Practices, knowledge and inter-professional relationships between speech pathologists and radiation therapists managing patients with head and neck cancer

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Abstract

Introduction: This study examined knowledge and practices of speech pathologists (SPs) and radiation therapists (RTs) regarding plan optimisation for head and neck cancer (HNC) patients, and the potential impacts on swallowing function. The secondary aim was to explore the level of interaction occurring between these professional groups within cancer centres. **Methods:** Two electronic surveys, with matched questions for SPs and RTs, explored: service/institutional demographics; clinician awareness, practices regarding plan optimisation to swallowing structures and; relationships and interactions between SPs and RTs in the management of HNC patients. Participant recruitment occurred through specialist professional networks with additional snowball sampling. Data were analysed with descriptive statistics and thematic analysis. **Results:** A total of 32 SPs and 41 RTs completed surveys. All SPs and 50% of RTs were aware of dose-dysphagia relationships, though SPs rarely used dosimetric information to inform patient management. Only 33% of RTs indicated that their centres actively constrain dose to swallowing structures, reporting that *staffing skill mixtures* and *lack of prescription by the treating RO* were restrictive factors. Both SPs and RTs acknowledged the importance of collaborating with colleagues (SPs/RTs) and felt they could assist their colleagues in devising patient management plans, though current collaboration/interaction was minimal. **Conclusions:** Levels of awareness were found to be higher in SP group. Despite high levels of awareness, limited use of swallowing structure dose constraints and hence dosimetric information specific to swallowing was rarely used to optimise/guide multidisciplinary HNC acute care. Opportunities for enhanced collaboration between SPs and RTs should be considered.

Introduction

Advanced radiotherapy techniques, such as intensity-modulated radiation therapy (IMRT) and volumetric modulated arc therapy (VMAT), facilitate more conformal delivery of radiation dose to the tumour. This results in better sparing of the organs at risk (e.g. spinal cord, brainstem) and any healthy surrounding tissue, leading to reduced radiation induced toxicity.[1] Dose limit thresholds to the spinal cord, brainstem, optic nerve and salivary glands are well established[2] and dose constraints are routinely prescribed for these regions to prevent

sequelae such as neuropathy, vision impairment and chronic xerostomia.[3–5]

More recent research has also recognised the importance of limiting radiation dose to critical structures involved in swallowing, identified as "dysphagia aspiration risk structures" (DARS). The DARS include the extended oral cavity (EOC), pharyngeal constrictor muscles (PCM), base of tongue (BOT), supraglottic larynx (SGL), glottic larynx (GL) and upper oesophageal sphincter (UES).[6] A number of studies have demonstrated promising early results, reporting superior swallowing outcomes and reduced long-term dysphagia through constraining dose to the DARS during radiation therapy treatment planning.[6–9] However, the clinical uptake of these planning constraints by treating radiation oncologists (RO) for the DARS into standard clinical practice is, as yet, limited. Due to heterogeneity in HNC sub-sites and the close proximity of swallowing structures to the primary tumour, constraints to guide dose reduction for the DARS dependent on location, are currently non-existent.[10] Another influencing factor has been the strength of the evidence to date, which has primarily evolved from retrospective studies of heterogeneous patient cohorts using varied outcome measures. Other logistical factors such as resourcing and current staff knowledge/skill mix within cancer centres, further complicate the implementation and translation of this evidence into practice.

Two professional groups, speech pathologists (SPs) and radiation therapists (RTs), are actively involved in HNC treatment. SPs manage swallowing disturbances across the treatment continuum, employing compensatory and rehabilitative interventions to maximise functional recovery. RTs generate each patient's individualised treatment plan as per the treating ROs prescription as well as deliver the patient's daily treatments. In the context of introducing routine dose limitation to the DARS within clinical services, active involvement and interactions between both of these professional groups, together with ROs, will be required. However, at present little is known as to the degree to which RTs utilise dose constraints to DARS when optimising HNC patient plans or how SPs use dose to DARS from the treatment plan to assist with dysphagia management. Within each profession group, knowledge bases and practices are known but inter-professional awareness is perhaps limited. Additionally, the status of current inter-professional relationships between SPs and RTs remains unexplored. Furthermore, investigations exploring the association between dose and dysphagia outcomes in HNC have only emerged in the last decade, and as such SPs and RTs have had limited opportunity for clinical implementation of DARS optimisation into standard care. Understanding the current practices, knowledge and inter-professional relationships of SPs and RTs regarding dose and dose limitation to the DARS may expedite translation of recent evidence into practice. The current study aimed to identify the current practices and knowledge possessed by SPs and RTs surrounding dose-optimisation of the DARS and dysphagia management in patients receiving (chemo)radiotherapy [C]RT treatment for HNC. In addition, it aimed to explore the extent of the current clinical relationships between SPs and RTs working within cancer centres.

Methods

Participants

SPs and RTs currently working within cancer centres across Australia and New Zealand who provide radiotherapy and clinical services during the acute management period (i.e. before, during and up to 3 months post-radiotherapy) to patients with HNC were eligible to participate. Clinicians were excluded if they were not involved in the provision of radiotherapy or speech pathology services to HNC patients, or if the services they provided were for sub-acute and long-term rehabilitation (i.e. beyond 3 months post-treatment) only. This study was conducted with full ethical approval (UQ #2017000970). All participants provided consent prior to commencing the survey. Gatekeeper approval was provided by the professional online/email groups who assisted survey dissemination.

Survey development

Electronic surveys for SPs and RTs were initially developed by the study authors (4 experienced SPs, 2 experienced RTs), through integrating current literature with expert consensus. The surveys were then circulated to a group of SPs and RTs currently working in multidisciplinary cancer centres that deliver radiotherapy to HNC patients for pilot testing ($n = 9$). This pilot trial group was asked to comment on the readability, functionality, comprehensiveness and appropriateness of the surveys. Following feedback obtained, five questions were removed for duplication of concepts, two questions were amended to clarify content and minor wording changes were made to two questions. Survey questions followed either an open-ended, multi-choice or dichotomous format and gathered information about: (1) participant demographics; (2) service/institutional demographics; (3) clinician awareness, processes and practices in relation to the delivery of treatment and management of HNC patients; and (4) relationships and

interactions between SPs and RTs in the workplace. The electronic survey for SPs and RTs originally contained 40 and 38 questions, respectively. However, of the original set of survey questions developed, only 33 questions in each survey were included for analysis in this paper. The unused questions were excluded from this analysis as they were unrelated to the specific aims of the current paper. The remaining 33 survey questions included: 11 demographic and service questions (Q1–Q11), 14 knowledge and discipline practice questions (Q12–Q25) and 8 relationship and interaction questions (Q26–Q33). A copy of both surveys completed by SPs and RTs is available for viewing as Appendix S1 and S2.

Procedure

The study involved a cross-sectional, two group, cohort design. Both surveys were hosted on surveymonkey.com.au and were completed anonymously. Surveys were disseminated across Australia and New Zealand through specialist member and clinician networks including the Australian and New Zealand Head and Neck Cancer Society (ANZHNCS) (international network for professionals working/interested in the field of HNC), Australia and New Zealand Head and Neck Cancer Google group (well established national forum for SPs who work in HNC care), Speech Pathology Australia forums (national body member network) and the Australian Radiation Therapy educator network (national education network for RTs). Each network group was comprised of experienced practicing and/or non-practicing clinicians and/or researchers in the HNC sphere. Clinicians who received the electronic link via email were asked to circulate the link to any eligible colleagues to facilitate additional recruitment (i.e., snowball sampling). Surveys were open for completion between August 2017 and March 2018.

Data analysis

Descriptive statistics including frequencies, means and percentages were used to analyse patterns of responses obtained from the total survey group. Open ended questions surrounding professionals (SP/RT) knowledge of the education provided by their colleagues were analysed using thematic analysis, to identify patterns and themes present in responses.[11] As per Braun and Clarke,[11] codes were then assigned to participant responses and the coding was used to inform the development of categories. The number (*n*) of participants who commented on each category was recorded. An independent researcher completed consensus coding through secondary reviewing of each of the participant responses, to ensure adequate agreement and methodological rigour.

Results

A total of 73 clinicians, of which 32 were SPs and 41 were RTs, completed the surveys. As it is unknown how many clinicians were forwarded the surveys, it is impossible to determine a response rate. However, within Australia and New Zealand, there are 31 dedicated multidisciplinary teams (MDTs) working in cancer centres providing management to the population of patients diagnosed with HNC.[12] The survey question number (e.g. Q1) and results from each group is outlined below.

Demographics and service characteristics

Demographic and service characteristics (Q1–4) are reported in Tables 1 and 2. The majority of clinicians in both groups were experienced, with over half having >6 years' experience working with patients with HNC, and over half were in full-time positions. Most reported that at least 10% of their caseload involved working with patients with HNC (Table 1). Within the SP group, half indicated that >40% of their caseload was providing HNC care.

Table 1. Participant demographics.

Demographic	Speech pathologists %	Radiation therapists %
Q1. Years qualified and practicing (SP *n* = 32; RT *n* = 41)		
0–2	9	10
3–5	19	15
6–10	13	31
11–15	28	20
15+	31	24
Q2. Years in HNC care (SP *n* = 32; RT *n* = 41)		
0–2	19	12
3–5	31	12
6–10	28	32
11–15	13	22
15+	9	22
Q3. Work type (SP *n* = 32; RT *n* = 41)		
Part time/casual (<15 h per week)	9	0
Part time/casual (15–32 h per week)	38	15
Full time (35+ h per week)	53	85
Q4. Proportion of caseload spent managing HNC patients (SP *n* = 32; RT *n* = 40)		
<10%	9	7
10–50%	35	78
40–70%	25	15
70–100%	31	0

n, total number; HNC, head and neck cancer; SP, speech pathologist; RT, radiation therapist.

Table 2. Service characteristics*.

Service characteristic	Speech pathologists %	Radiation therapists %
Q5. Location (SP *n* = 32; RT *n* = 40)		
Metropolitan	66	78
Regional	31	20
Rural	3	2
Q6. Workplace classification (SP *n* = 31; RT *n* = 40)		
Public hospital	100	100
Q7. New HNC patients treated annually (SP *n* = 32; RT *n* = 39)		
<100	25	18
100–200	25	15
200+	28	46
I don't know	22	21
Q8. Staff employed (SP *n* = 32; RT *n* = 40)		
<10 FTE	100	–
10–30 FTE	0	15
30–50 FTE	0	25
>50 FTE	0	60
I don't know	0	–
Q10. Point of initial patient contact (SP *n* = 32; RT *n* = 40)		
Multidisciplinary head and neck clinic	72	13
Radiation therapy planning	13	93
During active radiation therapy treatment	–	25
Early (weeks 1–3) treatment	56	–
Mid (weeks 4–5) treatment	13	–
Late (weeks 6–7) treatment	16	–
Post therapy (up to 3 months post) clinic	16	–
Q11. Points of involvement with HNC patient care (SP *n* = 30; RT *n* = 40)		
Multidisciplinary head and neck clinic	70	30
Radiation therapy planning	27	100
During active radiation therapy treatment		
Early (weeks 1–3) treatment	100	100
Mid (weeks 4–5) treatment	90	100
Late (weeks 6–7) treatment	90	100
Post therapy (up to 3 months post) clinic	90	5

n, total number; SP, speech pathologist; RT, radiation therapist; HNC, head and neck cancer; FTE, full time equivalent; VMAT, volumetric modulated arc therapy; IMRT, intensity modulated radiotherapy; –, RT participants were not asked to specify their involvement at these time points.
*Q5–11 only, Q12–25 reported in text.

As shown in Table 2, respondents in both groups worked in public metropolitan services managing a high throughput (>100+) of patients annually (Q5–7). Fewer SPs were employed in a full-time capacity across centres compared with RTs, whom were often part of teams of 10 or more staff (Q8). Both participant groups reported that their centres provided surgical and non-surgical (i.e. radiotherapy ± chemotherapy) treatment modalities. SPs and RTs were asked to specify at which time points, initial patient contact occurred within their centres (Q10) and participants had the option to select more than one timepoint. For the majority of SPs, initial patient contact occurred at the MDT head and neck clinic (72%) (Q10). In contrast, initial patient contact occurred during radiotherapy planning (93%) for the RTs (Q10). Regarding the time points at which clinicians outlined, they were involved with HNC patient care (Q11), over 70% of SPs indicated they were involved from the initial MDT, through treatment, and in the post-treatment phases. All RTs indicated they were involved during therapy planning and treatment with minimal numbers (5%) engaged in post-treatment care.

Clinical practices and knowledge – speech pathologists (SPs)

In regards to SPs' knowledge concerning the impact of radiotherapy on swallowing, all SPs were familiar with dose–effect relationships (Q12) and all but one clinician reported awareness surrounding procedures for dose-optimisation of structures in the head and neck (Q13). Half (47%) indicated they were aware that specific structures in the head and neck (e.g. brainstem, spinal cord) were routinely "dose-optimised" to limit functional impact (Q14). Almost all (90%) SPs were aware of how dosimetric information may be utilised to inform management of patient swallowing disorders (Q15) and most (81%) acknowledged that they were familiar with terminology (e.g. DARS) surrounding optimisation of the swallowing structures (Q16). However, under half (41%) of SPs indicated that swallowing structures were routinely dose-optimised at their workplaces, and half the group were unsure of their institution's DARS-optimisation practices (Q17).

Despite most (78%) indicating having access to dosimetric information (Q19) and an awareness that DARS information can be used to support the management of dysphagia (above Q15), less than half (47%) of the SPs accessed and used the specific dose delivered to the DARS to inform patient management (Q18). Of the 78% of SPs who had access to their patient's dose volume histogram (DVH), only 40% of these indicated they reviewed this information to guide their dysphagia management practices (Q20) and only 34% used this information during patient education (Q21). When asked about feeling confident interpreting DVHs, only 34% of SPs agreed or strongly agreed they were confident (16% unsure, 50% disagree/strongly disagree) (Q22). The majority (>70%) of SPs reported they used information on radiotherapy course type (97%), tumour site (100%), psychosocial factors (e.g. motivation, support) (97%) and patient's current swallowing function (97%) to tailor their patient education (Q23). Similarly, tumour site (97%), expected

side effects (97%), psychosocial factors (e.g. support, motivation) (90%) and current swallowing functions (100%) were factors used by over three-quarters of the SP group to guide acute management (Q24). When seeking more information about patient's radiotherapy treatment, SPs usually sought to communicate with the RO and/or nurse (Q25).

Clinical practices and knowledge – radiation therapists (RTs)

Survey questions regarding practices/processes used to plan and deliver radiotherapy to patients with HNC revealed that 82% of RTs worked in centres delivering radiotherapy treatment via conformal techniques (VMAT and/or IMRT) (Q12) and planned large numbers (200+) of HNC patients annually (Q13). When asked about their awareness of published HNC delineation guidelines (Q14), over half of RTs were familiar with international consensus guidelines.[13–15] Two-thirds (67%) of RTs indicated that an atlas-based segmentation tool (Q15) was used to generate contours for HNC patients at their centres, and 75% of RTs revealed that their centres employed a standard protocol (Q16) for contouring. When asked to detail specific head and neck structures contoured, RTs reported 11 structures (e.g. mandible, lens, brainstem, spinal cord, parotids) they routinely contour (Q17), pinpointing an additional 15 structures (e.g. pharynx, soft palate, jugular, temporal-mandibular joint) which were more commonly contoured by the treating RO (Q18). Thirty-one RTs (78%) reported that contouring a HNC plan for curative treatment was time-intensive, taking over 40 min per plan (Q19).

Half of responding RTs (52%) expressed an awareness of terminology (e.g. DARS) surrounding dose-optimisation of the swallowing structures (Q20); while 63% reported awareness of research evidence surrounding dose-optimisation of the swallowing structures to improve swallowing outcomes (Q21). Few (12%) RTs reported that their treating RO requested dose-optimisation of the DARS (26% sometimes, 62% no) (Q22) which was consistent with few RTs (33%) indicating that swallowing structures were being contoured at their workplace (36% sometimes, 6% unsure, 25% no) (Q23). The majority of RTs (94%) reported the lack of prescription from the treating RO was the leading reason as to why contouring of the swallowing structures was not occurring more commonly within centres (Q24) (22% also reported staffing skill mix as a factor). Regarding RTs' willingness to routinely contour the swallowing structures (Q25), 69% of RTs indicted they were willing if requested by the RO, though some commented that additional training would be required.

Clinical relationships between SPs and RTs

In both groups, two-thirds of clinicians felt it was important/very important to work closely with each other (Q26, Table 3). When asked if they had access to their respective colleagues to discuss matters of patient care/treatment, less than half of participants reported they were able to communicate with the other profession 'at anytime' (Q27) (Table 3). Across both professional groups (SPs/RTs), two-thirds of clinicians indicated they occasionally/rarely communicated with each other during the patient's on-treatment phase (Q28), and almost half had no interaction with the other profession at pre- and post-treatment time points (Table 3). Less than 10% of SP/RTs indicated having regular interactions with each other either pre, during or post-radiotherapy.

Only a third of SPs and RTs felt confident in their knowledge of the roles and responsibilities of the other profession (Q29, Table 3). When asked to describe the patient education provided by their colleagues, the survey question had a 26% ($n = 9$) and 24% ($n = 10$) non-response rate for SPs and RTs, respectively. Of those who responded, thematic analysis revealed that the majority of clinicians had reasonable awareness of the content of their colleague's patient education (Table 4), while 11 SPs and 1 RT felt unsure about or did not know what education their colleagues (SPs/RTs) provide. The majority of SPs (Q31, 84%) felt RTs could provide them with useful information for developing their swallowing management plans, yet only 49% of RTs felt they could provide useful information to SPs for management (Table 3). Few SPs ($n = 5$) and RTs ($n = 0$) were able to attend in-services provided by their fellow colleagues (Q32, Table 3). When asked to select strategies that could improve collaboration between disciplines, the majority (>75%) favoured attendance of each discipline at case conferences and/or regular in-servicing (Q33, Table 3), while the SPs also felt work-shadow/training and circulation of resources/materials could be beneficial.

Discussion

The findings from this study provide insight into the current clinical practices and knowledge possessed by SPs and RTs in relation to radiation dose-optimisation of swallowing structures and dysphagia management. Furthermore, this study also provides insight into the current state of interactions occurring between the two professional groups within cancer centres. The higher levels of awareness of terminology and evidence surrounding DARS demonstrated by the SPs (81%) is likely explained by their central role in managing patients with dysphagia within cancer centres. Over half the surveyed SPs reported

Table 3. Relationships and Interactions between SPs & RTs.

Question	Speech pathologists %	Radiation therapists %
Q26. Working closely with (SP/RT) is (SP *n* = 31; RT *n* = 39)		
Very important	19	15
Important	49	48
Moderately important	19	26
Slightly important	10	8
Not important	3	3
Q27. Access to communicate with a (SP/RT) (SP *n* = 32; RT *n* = 37)		
At anytime	38	41
On request	22	43
During a certain time	6	8
No communication with colleagues	34	8
Q28. Time points of interaction (between SP/RT) (SP *n* = 31; RT *n* = 39)		
Pre-radiation therapy		
Regularly	4	8
Occasionally/rarely	44	68
Never	52	24
During radiation therapy		
Regularly	10	8
Occasionally/rarely	62	68
Never	28	24
Post radiation therapy		
Regularly	4	4
Occasionally/rarely	29	14
Never	67	82
Q29. Confidence regarding roles of each (SP/RT) professional group (SP *n* = 32; RT *n* = 38)		
Yes	31	32
Somewhat	50	68
No	19	0
Q31. RTs/SPs can provide information useful for devising management plans (SP *n* = 32; RT *n* = 39)		
Yes	84	49
Sometimes	0	41
No	3	5
Other	13	5
Q32. Able to attend regular in-services held by (SP/RT) (SP *n* = 31; RT *n* = 38)		
Yes	16	0
No	42	68
Sometimes	0	24
Unaware/unsure	42	0
Other	0	8
Q33. Strategies to improve collaboration (between SP/RT) (SP *n* = 32; RT *n* = 39)		
Attendance by each discipline at case conference	88	87
Regular in-servicing	91	77
Work shadowing/training	81	44
Regular circulation of materials/resources	72	49
Other	9	0

n, total number; SP, speech pathologist; RT, radiation therapist.

that managing HNC patients was a significant proportion of their caseload, therefore specialist knowledge about this specific caseload and new emerging issues is to be expected. In contrast, due to their diverse role in cancer care, fewer RTs (15%) surveyed were predominantly involved in working with HNC patient. This difference may explain why less RTs were aware of (52%), and understood the impact of (63%) radiation dose to swallowing structures. It also is acknowledged that national and international cancer agencies (e.g., Quantitative Analyses of Normal Tissue Effects in the Clinic (QUANTEC), Clinical Oncology Society of Australia (COSA), National Comprehensive Cancer Network (NCCN)) currently have limited recommendations regarding consensus dose constraints to swallowing structures to date, and hence it is not yet part of expected clinical knowledge/practice.

Despite high levels of awareness, dosimetric information was rarely used by SPs to inform patient education and management during the acute treatment phase. Many clinicians had access to dosimetric information and acknowledged its usefulness, but prioritised radiotherapy course type, tumour site, psychosocial factors and the patient's current swallowing function when devising management plans. Only 34% of SPs were confident in interpreting a DVH, suggesting that large numbers of SPs may feel unsure in this clinical area. Hence, it was not unexpected that SPs indicated a need for greater access to professional development and training opportunities. Few SPs/RTs reported they regularly attended in-services provided by their colleagues and many felt chances to communicate with their RT/SP colleagues were restricted to 'on request only'. Breaking down these barriers and working to develop training and information sessions relevant for the two professions on this topic area will help address these issues.

The relationship between dosimetric parameters and swallowing outcomes has been profiled within the literature.[8] However, as previously discussed, determining universal dose constraints for DARS remains challenging and a number of logistical and health service issues exacerbate the challenges in translating this evidence into clinical practice. Within the current study, RTs revealed that "*not [being] prescribed by the radiation oncologist*" (94%) and "*staffing skill mix*" (22%) were factors limiting routine contouring of the DARS within their centres, corroborating current identified limitations. Whilst barriers to dose-optimisation to the DARS were recognised by RTs, two-thirds of respondents (69%) expressed willingness to undergo further training to support DARS contouring. Progress to date with translating dosimetric constraints for OARs (e.g. brainstem, spinal cord) into clinical practice, highlights potential for routine contouring of the DARS to occur within cancer centres, however exploring the value of this process will need to continue in line with emerging evidence.

Table 4. Clinicians (SPs/RTs) awareness of patient education provided by colleagues (Q30) – open-ended responses.

Professional group	Category	*n*	Topics within categories
RTs perceptions of SP roles in patient education	Management of swallowing difficulties	25	• Swallowing difficulties with post-operative complications or side effects • Exercises and information to help maintain swallowing
	Management of speech changes	15	• Exercises and information to help maintain speech and communication • Preserve speaking functions throughout radiation treatment and once treatment is completed
	Tracheostomy management	4	• Speech assistance for tracheostomised patients
	Provision of information relating to dental hygiene	3	• Dental/mouth hygiene
	Enteral nutrition	1	• PEG/nasogastric tube feeding
	Managing side effects	10	• Managing changes in saliva, taste, speech, dry mouth
	Multidisciplinary team collaboration	3	• Liaise with team as to potential patient issues due to these factors
	Limited awareness	1	• Participant reported "*I would like more interaction*" *
SP perceptions of RTs roles in patient education	Management of treatment-related side effects	6	• Side effects (toxicities) • Skin care, pain medication
	Practicalities of treatment	14	• Operationalisation of linear accelerator machines, shaping and contouring of the treatment mask, table positioning • Procedure information regarding clinic location, scheduling, contact details
	Limited awareness	11	• Participants reported they were *"unsure"** and stated that they *"would like more information surrounding this"**

SP, speech pathologist; RT, radiation therapists; *n*, total number; PEG, percutaneous endoscopic gastrostomy.
*Direct participant responses.

Whilst both professional groups acknowledged the importance of inter-professional collaboration, the present study revealed that little to no direct interaction between SPs and RTs occurs within cancer centres. This finding is to be expected, given that the area of DARS sparing radiotherapy is an emerging practice. Radiation Oncologist's specialist clinical expertise and leadership is critical in the process, providing direction around DARS optimisation and is the conduit through which SPs and RTs access information. Previous research has demonstrated that strong professional networks are a key facilitator in successfully translating new evidence into practice.[16] Hence, the lack of strong professional networks between the two professions is potential barrier to greater use of dose information in dysphagia management in clinical practice. Confidence in their ability to communicate useful information surrounding optimisation of dose to swallowing structures/dysphagia management which would assist colleagues in devising patient management plans, was also varied amongst clinicians. This indicates that opportunities to freely communicate and establish awareness of each other's roles within centres may support practice change.

Although this study provides some of the first insights into the knowledge/practices and inter-professional relationships between SPs and RTs within cancer centres, a number of limitations are acknowledged. Due to the sampling method employed, it is impossible to determine a response rate for this survey. However, it has to be assumed to be quite low, due to general knowledge regarding numbers of employed SPs and RTs across Australia. Therefore, it cannot be assumed that the sample collected for this study is representative of the wider HNC RT/SP community. Hence, the small sample must be considered and all findings should be interpreted and applied with caution. The small sample size also prohibited any valid sub-analysis of the data to explore how exposure to the HNC caseload influenced knowledge. Furthermore, all participants reported data from public hospitals within Australia and New Zealand, providing no insight into current service provision within private cancer centres or in other international settings. Understanding practices in private centres will be particularly important for future research, given the increasing decentralisation of radiotherapy delivery and HNC care to smaller private centres. Additionally, as responses were collected

anonymously, it is unclear how many centres, or the distribution of centres across Australia/New Zealand, were represented within this study, reducing the capacity to generalise results regarding current knowledge and clinical practices possessed by SPs and RTs working in cancer centres. As is common with survey methodology, total numbers of respondents also varied between individual questions. The fact that this topic is an emerging area of theory and practice may explain the low and variable response rates. While the findings of the survey were consistent with the clinical experiences of the current researchers, larger samples may provide greater insights into additional issues and concerns which were not raised here. Future studies which employ other methodologies, such as qualitative methods, may help provide more in-depth and insightful information.

Conclusion

The clinical practices and knowledge of SP and RTs regarding dose-optimisation of the DARS and the relationship with dysphagia outcomes in HNC, reflect the emerging nature of the evidence published to date. The theoretical level of awareness was higher in SPs, compared to RTs likely due to their central role in dysphagia management. Both groups acknowledged the value of enhanced interdisciplinary collaboration; however at present, there is limited interaction occurring between SPs and RTs in clinical practice. Developing methods for staff to collaborate and educate each other in this novel area of DARS optimisation will be central to translating research evidence into clinical practice and facilitating greater use of dose information in the multidisciplinary care of patients receiving radiotherapy for HNC.

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Conflict of Interest

The authors declare no conflict of interest.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1. Survey completed by speech pathologists.
Appendix S2. Survey completed by radiation therapists.