PORT (n=145) for newly diagnosed nonmetastatic HNACC between January 1981 and December 2016. A median follow-up period was 4.9 years (range, 0.34 to 27.6 years). PS was estimated using factors including age, sex, T stage, N stage, radiotherapy techniques and primary sites. Propensity score (PS) matching and inverse probability of treatment weighting (IPTW) were used to estimate and compare survival outcomes.
Results: Five-year overall survival (OS), disease-free survival (DFS), locoregional control (LRC), distant metastasis-free survival (DMFS) of unmodified cohort were 75.7%, 31.4%, 66.3%, 34.2% (definitive RT) and 86.8%, 49.5%, 79.7%, 55.9% (surgery + PORT). These treatment outcomes were significantly different between two groups ($p<0.05$). In the PS-matched cohort, differences between the treatment outcomes were not significant. Five-year OS, DFS, LRC, DMFS of PS-matched cohort were 72.6%, 37.8%, 74.4%, 39.5% (definitive RT) and 89.3%, 48.2%, 79.0%, 52.1% (surgery + PORT). Also in the IPTW-adjusted cohort, the differences were not significant. Five-year OS, DFS, LRC, DMFS of IPTW-adjusted cohort were 77.9%, 51.7%, 81.9%, 53.6% (definitive RT) and 86.8%, 48.9%, 79.9%, 53.7% (surgery + PORT).
Conclusion: Two analyses using PS showed there were no differences in treatment outcomes after balancing patient characteristics. Definitive RT would actually give better treatment results than those reported in previous studies. These results ultimately need be explored in a randomized trial.

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2865

Reduced Primary Tumor Volume after Induction Chemotherapy Correlates with Improved Survival in Locally Advanced Head and Neck Cancer

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Purpose/Objective(s): Induction chemotherapy followed by concurrent chemo-radiotherapy is a main treatment option in patients with locally advanced head and neck cancer (LA-HNSCC). However, the clinical value of the extent of tumor burden reduction after induction chemotherapy (IC) remains unclear.
Materials/Methods: Patients with newly diagnosed LA-HNSCC from year 2007 to 2016 at a single center were included in the retrospective study. All patients received primary treatment as TPF (taxotere, platinum, fluorouracil) induction chemotherapy (IC) followed by daily definitive (chemo-)radiotherapy with daily intensity-modulated radiotherapy for 70 Gy in 35 fractions with cisplatin-based chemotherapy. The tumor volumes, including primary tumor and the involved lymph nodes, before and after IC were manually delineated based on the contrast-enhanced computed tomography (CT) study at initial diagnosis and after IC completion, respectively. Both image studies were done before the first treatment of radiotherapy. The gross tumor volume (GTV) of the primary tumor and the involved nodes were designated as GTVp and GTVn, and GTVtotal = GTVp + GTVn. The reduction ratio (RR) of GTV was calculated as $(GTV_{interim}\text{-}GTV_{at\ diagnosis})/GTV_{at\ diagnosis}$. The primary endpoints were disease-free survival (DFS) and overall survival (OS). Cox regression model was applied to analyze the correlation of RR and outcomes.
Results: The clinical features and tumor volumes of 56 patients were collected and analyzed. Fifty-four patients were diagnosed with stage IV disease and two were stage III. The most common primary cancer sites were oral cavity (20/56, 35.7%), hypopharynx (18/56, 32.1%) and HPV-negative oropharynx (17/56, 30.4%). Twenty-five (25/56, 44.6%) patients had no evidence of disease on last follow-up, twelve (12/56, 21.4%) had tumor recurrence, and nineteen (19/56, 33.9%) were never disease-free. The median follow-up time interval was 27.1 months. The median DFS and OS was 16.5 months and 20.6 months, respectively. Two-year survival rates were 96%, 55%, 41% for patients had no evidence of disease, tumor recurrence, and never disease-free, respectively. The GTV before and after IC and RR are listed in the table. In multivariate Cox regression, we discovered that the reduction ratio of primary tumor volume, GTVpRR, was the only significant factor related to improved survival, with DFS hazard ratio (HR) = 0.09 (95% CI 0.01-0.58, p = 0.012) and OS HR = 0.05 (95% CI 0-0.56, p = 0.014). Other factors including GTVnRR, GTVtotalRR, the primary cancer site, the absolute value of primary tumor and lymph node volume reduction were not significantly related to DFS or OS.
Conclusion: The reduction ratio of primary tumor volume significantly correlates with improved DFS and OS, while the reduction ratio of involved lymph nodes and total tumor volume do not.

Abstract 2865; Table 1

(mean±SD)	At diagnosis (ml)	After IC (ml)	RR (%)
GTVtotal	71.82±55.67	40.91±38.53	47±21
GTVp	53.90±50.89	32.27±34.43	43±22
GTVn	17.92±29.01	8.63±14.83	49±27

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Preventive Effect of Thixotropic Gel Containing Tea Tree Oil from Severe Radiation Dermatitis for Head and Neck Cancer Patients Receiving Chemoradiation

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Purpose/Objective(s): To investigate the topical use of thixotropic gel containing Melaleuca alternifolia (Tea Tree) oil, which has the capability of lowering intradermal temperature and antimicrobial property, to prevent and reduce the severity of acute radiation dermatitis in head and neck cancer (HNC) patients.
Materials/Methods: Patients with stage II-IVb HNC treated with definitive radiotherapy (RT) with or without concurrent chemotherapy or target therapy were enrolled in this multi-institutional prospective study. Intensity-modulated radiotherapy was used with conventional fractionation to deliver 70 Gy to gross tumor and lymphadenopathy and 60 Gy at least to the neck regions. The gel was applied to the irradiated area during the entire RT course. Acute skin reaction was evaluated according to CTCAE 4.0 and was recorded with neck photography weekly. The pain was assessed weekly by using a visual analog scale (VAS) (range 0−10). For assessment of the quality of life, the validated Chinese version of Skindex-16 questionnaire (range 0−6 with 6 being worse symptoms) was completed at the beginning, the end, and one month after RT.
Results: A total of 37 patients was enrolled in this study from Sep. 2017 to Oct. 2018. Among these patients, the maximum detected acute skin toxicity was Grade 1 in 6 (16.2%), Grade 2 in 22 (59.5%), and Grade 3 in 9 (24.3%) patients. No Grade 4 dermatitis was noted. The mean received fraction number to develop Grade 1, 2 and 3 dermatitis was 20.2, 27.6, and 30.7, respectively. The mean highest VAS pain score during RT was 3.7. As for Skindex-16 results, the scores of the mean total, symptom domain, emotion domain, and function domain were 2.9, 0.3, 2.0, 0.6 at the

beginning, 13.6, 6.9, 4.7, 2.0 at the end, and 1.9, 0.8, 0.6, 0.6 at one month after RT.

Conclusion: Our study results suggest that thixotropic gel containing Tea Tree oil is safe and effective in the management of acute skin reaction of RT and effects in a late-developed and lower rate of severe dermatitis in HNC patients. Moderate pain with rapid recovery of quality of life is also impressed. Further prospective randomized controlled studies will be conducted for validation.

研究結果表明：含茶樹精油水凝膠可安全有效地處理放射治療的急性皮膚反應，並且對頭頸癌患者晚期皮膚炎和低發生率的嚴重皮膚炎有一定作用。治療過程中的生活品質快速恢復也給人留下了深刻的印象。進一步的前瞻性隨機對照研究將進行再次驗證。

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Pre-treatment Class Attendance and Outcomes in Head & Neck Cancer Patients Undergoing Radiation

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Purpose/Objective(s): The pre-treatment ("Prehab") class at our center is a psychoeducational group intervention offered to all patients starting radiotherapy for head & neck cancers (HNC). It focuses on symptom management, psychosocial support, swallowing, and nutrition during treatment. The purpose of this study is to investigate any relationship of class attendance with treatment outcomes.

Materials/Methods: In this retrospective cohort study, records of patients with HNC receiving radiotherapy (RT) as part of curative intent treatment from September 2013 to December 2017 were retrieved from our prospective quality assurance tool, the Anthology of Outcomes, and cross referenced with class attendance. Overall survival (OS), locoregional recurrence free survival (LRFS), and locoregional recurrence (LRR) were compared between prehab attendees (PA) and non-attendees (PNA).

Results: There were 864 PA and 1128 PNA. For PA and PNA, OS was 88% vs 80% ($p<0.001$), LRFS was 84% vs 75% ($p<0.001$) and LRR was 11.7% vs 16% ($p=0.016$) respectively at 2 years. At baseline, PA were less frequently ECOG performance status ≥ 2 (3% vs 5%, $p = 0.002$), current smokers (29% vs 40%, $p < 0.001$), heavy drinkers (14% vs 18%, $p = 0.035$), P16 negative oropharynx cancers (17 vs 25%, $p = 0.003$), T3/T4 (41% vs 48%, $p=0.001$), and N2/3 (51% vs 55%, $p<0.001$). On univariable analysis, baseline characteristics significantly associated with worse OS were (HR, 95%CI): ECOG ≥ 2 (6.34, 4.25 − 9.46), current smoking (1.96, 1.56 − 2.47), heavy drinking (1.67, 1.26 − 2.21), PNA (1.59, 1.26 − 2.03), age$\geq$62 (1.67, 1.33 − 2.11), and RT alone (2.04,1.5-2.77). On multivariable analysis (MVA), OS and LRFS were independently and unfavorably associated with PNA, as were current smoking, ECOG ≥ 2, T3/4, and N2/3. Treatment other than concurrent chemoRT was also associated with worse OS, LRFS, and LRR on MVA.

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better cancer outcomes. Whether the class itself influences outcomes or serves as a marker of favorable prognosis patients cannot be determined from this study design, but merits future study.

Abstract 2867; Table 1 MVA Results: HR and 95% CI

	OS	LRFS	LRR
PNA	1.41 (1.09 − 1.82)	1.37 (1.11 − 1.70)	Nonsignificant(NS)
Current smoking	1.48 (1.15 − 1.91)	1.44 (1.15 − 1.79)	NS
ECOG ≥ 2	4.65 (3.02 − 7.16)	3.56 (2.40 − 5.28)	1.84 (1.08 − 3.12)
T3/T4	2.22 (1.7 − 2.89)	2.39 (1.91 − 3.0)	1.94 (1.48 − 2.54)
N2/N3	2.52 (1.82 − 3.48)	1.7 (1.31 − 2.21)	NS
Treatment*			
RT alone	2.35 (1.64 − 3.36)	2.49 (1.82 − 3.41)	1.72 (1.18 − 2.49)
Surgery+ chemoRT	3.87 (2.27 − 6.59)	4.05 (2.56 − 6.41)	2.72 (1.49 − 4.94)
Surgery+ RT	2.43 (1.54 − 3.85)	2.38 (1.62 − 3.5)	1.66 (1.05 − 2.64)

*relative to concurrent chemoRT

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Head and Neck Reirradiation with Proton Therapy (PBT), IMRT, or Stereotactic Radiotherapy (SABR): Clinical Outcomes of a Prospective Registry

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Purpose/Objective(s): Locoregional recurrence remains the most common pattern of failure in head and neck cancers (HNC). Despite emerging retrospective data showing durable local control and improved survival with highly conformal reirradiation (reRT) techniques, prospective data of large patient cohorts is lacking. Here we present preliminary clinical outcomes of our prospective reRT registry protocol.

Materials/Methods: 167 patients with history of prior HN radiation were prospectively enrolled and treated with curative-intent IMRT, proton therapy (PBT), or stereotactic radiotherapy (SABR) between 2015 and 2018 for recurrent or second primary HNC. Outcomes were evaluated using Kaplan-Meier and stratified by treatment modality. Toxicity was evaluated using CTCAE v4.03. UVA and MVA was performed via Cox proportional hazards and logistic regression modeling.

Results: A total of 69 IMRT, 54 SABR, and 44 PBT reRT courses were assessed. Overall median follow-up was 18.2 months (0.4-45.7). There were no significant differences in age, gender, performance status, smoking status, or previous RT dose among treatment groups. The mean reRT BED (α/β 10) was 76.6±8.7 Gy. Overall, 55% received upfront surgery (SABR 28% vs. 55% PBT vs 77% IMRT, $p<0.0001$), and 66% received chemotherapy. 1- and 2-year OS rates were 83% and 70%, with no differences by radiation modality ($p=0.584$). Median time to LRF and PFS were 23.2 months (95% CI: 13.3-33.1) and 13.6 months (95% CI: 9.2-18.0), respectively, with no significant differences noted. Table 1 provides a summary of stratified clinical outcomes stratified. 11% of patients developed DM. In the 8 patients with DM before reRT, there was a 14.9 month median OS with only one death and one LRF. On MVA, SCC histology was associated with greater mortality (HR 4.1, 95% CI 1.6-10.2;