

NCCN Guidelines® Insights

Head and Neck Cancers, Version 2.2013

Featured Updates to the NCCN Guidelines

David G. Pfister, MD¹; Kie-Kian Ang, MD, PhD²; David M. Brizel, MD³; Barbara A. Burtness, MD⁴; Paul M. Busse, MD, PhD⁵; Jimmy J. Caudell, MD, PhD⁶; Anthony J. Cmela, MD⁷; A. Dimitrios Colevas, MD⁸; Frank Dunphy, MD³; David W. Eisele, MD⁹; Jill Gilbert, MD⁷; Maura L. Gillison, MD, PhD¹⁰; Robert I. Haddad, MD¹¹; Bruce H. Haughey, MChB, MS¹²; Wesley L. Hicks Jr, MD¹³; Ying J. Hitchcock, MD¹⁴; Merrill S. Kies, MD²; William M. Lydiatt, MD¹⁵; Ellie Maghami, MD¹⁶; Renato Martins, MD, MPH¹⁷; Thomas McCaffrey, MD, PhD⁶; Bharat B. Mittal, MD¹⁸; Harlan A. Pinto, MD⁸; John A. Ridge, MD, PhD⁴; Sandeep Samant, MD¹⁹; David E. Schuller, MD¹⁰; Jatin P. Shah, MD, PhD¹; Sharon Spencer, MD²⁰; Randal S. Weber, MD²; Gregory T. Wolf, MD²¹; Frank Worden, MD²¹; Sue S. Yom, MD, PhD²²; Nicole R. McMillian, MS²³; and Miranda Hughes, PhD²³

Abstract

These NCCN Guidelines Insights focus on nutrition and supportive care for patients with head and neck cancers. This topic was a recent addition to the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Head and Neck Cancers. The NCCN Guidelines Insights focus on major updates to the NCCN Guidelines and discuss the new updates in greater detail. The complete version of the NCCN Guidelines for Head and Neck Cancers is available on the NCCN Web site (NCCN.org). (*JNCCN* 2013;11:917–923)

From ¹Memorial Sloan-Kettering Cancer Center; ²The University of Texas MD Anderson Cancer Center; ³Duke Cancer Institute; ⁴Fox Chase Cancer Center; ⁵Massachusetts General Hospital Cancer Center; ⁶Moffitt Cancer Center; ⁷Vanderbilt-Ingram Cancer Center; ⁸Stanford Cancer Institute; ⁹The Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins; ¹⁰The Ohio State University Comprehensive Cancer Center - James Cancer Hospital and Solove Research Institute; ¹¹Dana-Farber/Brigham and Women's Cancer Center; ¹²Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine; ¹³Roswell Park Cancer Institute; ¹⁴Huntsman Cancer Institute at the University of Utah; ¹⁵UNMC Eppley Cancer Center at The Nebraska Medical Center; ¹⁶City of Hope Comprehensive Cancer Center; ¹⁷University of Washington/Seattle Cancer Care Alliance; ¹⁸Robert H. Lurie Comprehensive Cancer Center of Northwestern University; ¹⁹St. Jude Children's Research Hospital/The University of Tennessee Health Science Center; ²⁰University of Alabama at Birmingham Comprehensive Cancer Center; ²¹University of Michigan Comprehensive Cancer Center; ²²UCSF Helen Diller Family Comprehensive Cancer Center; and ²³National Comprehensive Cancer Network.

Disclosures for the NCCN Head and Neck Cancers Panel

Individual disclosures of potential conflicts of interest for the NCCN Head and Neck Cancers Panel members can be found on page 918.

Please Note

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) are a statement of consensus of the authors regarding their views of currently accepted approaches to treatment. **The NCCN Guidelines® Insights highlight important changes in the NCCN Guidelines® recommendations from previous versions. Colored markings in the algorithm show changes and the discussion aims to further understanding of these changes by summarizing salient portions of the panel's discussion, including the literature reviewed.**

The NCCN Guidelines Insights do not represent the full NCCN Guidelines; further, the National Comprehensive Cancer Network® (NCCN®) makes no representation or warranties of any kind regarding the content, use, or application of the NCCN Guidelines and NCCN Guidelines Insights and disclaims any responsibility for their applications or use in any way.

The full and most current version of these NCCN Guidelines are available at NCCN.org.

© National Comprehensive Cancer Network, Inc. 2013, All rights reserved. The NCCN Guidelines and the illustrations herein may not be reproduced in any form without the express written permission of NCCN.

Head and Neck Cancers, Version 2.2013

NCCN: Continuing Education**Accreditation Statement**

This activity has been designated to meet the educational needs of physicians, nurses, and pharmacists involved in the management of patients with cancer. There is no fee for this article. The National Comprehensive Cancer Network (NCCN) is accredited by the ACCME to provide continuing medical education for physicians. NCCN designates this journal-based CE activity for a maximum of *1.0 AMA PRA Category 1 Credit(s)*[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

NCCN is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is accredited for 1.0 contact hour. Accreditation as a provider refers to recognition of educational activities only; accredited status does not imply endorsement by NCCN or ANCC of any commercial products discussed/displayed in conjunction with the educational activity. Kristina M. Gregory, RN, MSN, OCN, is our nurse planner for this educational activity.



National Comprehensive Cancer Network is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education. NCCN designates this continuing education activity for 1.0 contact hour(s) (0.1 CEUs) of continuing education credit in states that recognize ACPE accredited providers. This is a knowledge-based activity. UAN: 0836-0000-13-013-H01-P

All clinicians completing this activity will be issued a certificate of participation. To participate in this journal CE activity: 1) review the learning objectives and author disclosures; 2) study the education content; 3) take the posttest with a 66% minimum passing score and complete the evaluation at <http://education.nccn.org/node/27285>; and 4) view/print certificate.

Release date: August 22, 2013; Expiration date: August 22, 2014

Learning Objectives:

Upon completion of this activity, participants will be able to:

- Integrate into professional practice the updates to NCCN Guidelines for Head and Neck Cancers
- Describe the rationale behind the decision-making process for developing the NCCN Guidelines for Head and Neck Cancers

EDITOR: **Kerrin M. Green, MA**, Assistant Managing Editor, *JNCCN—Journal of the National Comprehensive Cancer Network*, has disclosed that she has no relevant financial relationships.

CE AUTHORS: **Deborah J. Moonan, RN, BSN**, Manager, CE Supporter Outreach, has disclosed the following relationships with commercial interests: AstraZeneca: Stockholder/Former Employee. **Kristina M. Gregory, RN, MSN, OCN**, Vice President, Clinical Information Operations, has disclosed that she has no relevant financial relationships. **James Prazak, RPh**, Assistant Director, Continuing Education and Grants, has disclosed the following relationships with commercial interests: Bristol-Myers Squibb Company: Pension; Pfizer, Inc: Stockholder; United Healthcare Group: Stockholder; Johnson & Johnson: Stockholder. **Nicole R. McMillian, MS**, Guidelines Coordinator, has disclosed no relevant financial relationships. **Miranda Hughes, PhD**, Oncology Scientist/Senior Medical Writer, has disclosed no relevant financial relationships.

Disclosure of Affiliations and Significant Relationships: NCCN Head and Neck Cancers Panel

The following authors have no relevant financial interests to disclose: Dr. Busse, Dr. Eisele, Dr. Gillison, Dr. Haddad, Dr. Haughey, Dr. Hicks, Dr. Hitchcock, Dr. Kies, Dr. Lydiatt, Dr. Maghami, Dr. McCaffrey, Dr. Ridge, Dr. Samant, Dr. Shah, Dr. Spencer, Dr. Weber, and Dr. Wolf.

The following authors have disclosed the following relevant financial relationships:

Dr. Ang: Consultant for Eli Lilly and Company.

Dr. Brizel: Advisory board member for Siemens Molecular Imaging.

Dr. Burtness: Advisor for Bristol-Myers Squibb Company. Research funding from Genentech, Inc. and Novartis Pharmaceuticals Corporation. PI for Pfizer Inc. Advisory board member for Amgen Inc.

Dr. Caudell: Consultant for Boehringer Ingelheim GmbH.

Dr. Cmelak: Advisory board member for Amgen Inc.

Dr. Colevas: Clinical research support from Bayer HealthCare; Exelixis Inc.; Genentech, Inc.; and ActoGeniX NV. Research funding from Boehringer Ingelheim GmbH and GlaxoSmithKline. Serves on the Head and Neck Steering Subcommittee for NCI. Site investigator for RTOG and ECOG. Committee member for ECOG.

Dr. Dunphy: PI for Bristol-Myers Squibb Company.

Dr. Gilbert: Serves on the NCI Taskforce Metastatic HNC. Member of ECOG.

Dr. Martins: PI for Bayer HealthCare; Eisai Inc.; Genentech, Inc.; Novartis Pharmaceuticals Corporation; and Pfizer Inc. Clinical research support from Exelixis Inc.

Dr. Mittal: PI for Genentech, Inc.

Dr. Pfister: Clinical trial support from AstraZeneca Pharmaceuticals LP; Exelixis Inc.; Genentech, Inc.; ImClone Systems Incorporated; and Novartis Pharmaceuticals Corporation. Serves on the Data Safety Monitoring Board for Boehringer Ingelheim GmbH.

Dr. Pinto: Site PI for Bristol-Myers Squibb Company. Advisory board member for Eli Lilly and Company.

Dr. Schuller: Cochair Emeritus for NCI.

Dr. Worden: PI for Pfizer Inc. Speakers' bureau member for Bristol-Myers Squibb Company.

Dr. Yom: PI for Genentech, Inc.

The NCCN Guidelines Staff have no conflicts to disclose.

Supported by educational grants from Eisai, Inc.; Millennium: The Takeda Oncology Company; Teva Pharmaceuticals; Bayer HealthCare Pharmaceuticals Inc.; Celgene Corporation; Endo Pharmaceuticals and HealthTronics; Genentech; and ARIAD Pharmaceuticals, Inc.

Head and Neck Cancers, Version 2.2013

PRINCIPLES OF NUTRITION: MANAGEMENT AND SUPPORTIVE CARE¹⁻³

Most head and neck cancer patients lose weight as a result of their disease, health behaviors, and treatment-related toxicities. Nutritional management is very important in head and neck cancer patients to improve outcomes and to minimize significant temporary or permanent treatment-related complications (eg, severe weight loss). It is recommended that the multidisciplinary evaluation of head and neck cancer patients include a registered dietitian and a speech-language/swallowing therapist.

Assessment and Management

• Nutrition

- Close monitoring of nutritional status is recommended in patients who have: 1) significant weight loss (>10% ideal body weight); and/or 2) difficulty swallowing because of pain or tumor involvement prior to treatment. All patients should be evaluated for nutritional risks and should receive nutrition counseling by a registered dietitian and/or indicated treatment with various nutrition interventions, such as feeding tubes (eg, nasogastric [NG] tubes, percutaneous endoscopic gastrostomy [PEG] tubes) or intravenous nutrition support (but only if enteral support is not feasible).
- Pre- and post-treatment functional evaluation including nutritional status should be undertaken using either subjective or objective assessment tools. All patients should receive dietary counseling with the initiation of treatment, especially with radiotherapy-based treatments. Follow-up with the registered dietitian should continue at least until the patient has achieved a nutritionally stable baseline following treatment. For some patients with chronic nutritional challenges, this follow-up should be ongoing.

• Speech and Swallowing

- A formal speech and swallowing evaluation at baseline is recommended: 1) for patients with speech and/or swallowing dysfunction; or 2) for patients whose treatment is likely to affect speech and/or swallowing. Patients with ongoing abnormal function should be seen regularly by speech-language pathologists. Dysphagia and swallowing function can be measured by clinical swallowing assessments or by videofluoroscopic swallowing studies. Patient quality-of-life evaluations should also include assessment for any changes in speech and communication; changes in taste; and assessment for xerostomia, pain, and trismus. Follow-up with the speech-language pathologist should continue at least until the patient has achieved a stable baseline following treatment. For some patients with chronic speech and swallowing challenges, this follow-up may need to be indefinite.

¹Ehrsson YT, Langius-Eklöf A, Laurell G. Nutritional surveillance and weight loss in head and neck cancer patients. *Support Care Cancer* 2012;20:757-765.

²Locher JL, Bonner JA, Carroll WR, et al. Prophylactic percutaneous endoscopic gastrostomy tube placement in treatment of head and neck cancer: a comprehensive review and call for evidence-based medicine. *JPEN J Parenter Enteral Nutr* 2011;35:365-374.

³Langius JA, van Dijk AM, Doornaert P, et al. More than 10% weight loss in head and neck cancer patients during radiotherapy is independently associated with deterioration in quality of life. *Nutr Cancer* 2013;65:76-83.

Version 2.2013 © National Comprehensive Cancer Network, Inc. 2013. All rights reserved. The NCCN Guidelines® and this illustration may not be reproduced in any form without the express written permission of NCCN®.

NUTR-A
1 of 2

NCCN Categories of Evidence and Consensus

Category 1: Based upon high-level evidence, there is uniform NCCN consensus that the intervention is appropriate.

Category 2A: Based upon lower-level evidence, there is uniform NCCN consensus that the intervention is appropriate.

Category 2B: Based upon lower-level evidence, there is NCCN consensus that the intervention is appropriate.

Category 3: Based upon any level of evidence, there is major NCCN disagreement that the intervention is appropriate.

All recommendations are category 2A unless otherwise noted.

Clinical trials: NCCN believes that the best management for any cancer patient is in a clinical trial. Participation in clinical trials is especially encouraged.

Overview

A new section on “Principles of Nutrition” was recently added to the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Head and Neck Cancers. This new section outlines the management of nutrition and supportive care for patients with head and neck cancers who are prone to weight loss, which can often be severe, as a result of treatment-related toxicity, disease, and health behaviors.¹ Multidisciplinary evaluation is integral to minimizing or decreasing weight loss and should involve a registered dietitian and a speech-language/swallowing therapist.

Before treatment, patients with head and neck cancer are prone to weight loss because they may have difficulty swallowing from pain or obstruction caused by their tumor; patients are also at risk for dehydration. Although multimodality treatment for head and neck cancers is improving outcomes, it can be associated with severe toxicities.¹⁻³ Many patients with head and neck cancers will receive radiation-

Head and Neck Cancers, Version 2.2013

PRINCIPLES OF NUTRITION: MANAGEMENT AND SUPPORTIVE CARE¹⁻³**Use of Alternative Routes for Nutrition (NG and PEG Tubes)**

- The panel does not recommend prophylactic PEG or NG tube placement in patients with very good PS and without significant pretreatment weight loss, significant airway obstruction, or severe dysphagia. However, these patients will need encouragement to monitor their caloric intake and to assess for changes in body weight during treatment. They also may need temporary tube feeding intervention during and/or after treatment.
- Prophylactic feeding tube placement should be strongly considered for patients with:
 - > Severe weight loss prior to treatment, 5% weight loss over prior 1 month, or 10% weight loss over 6 months;
 - > Ongoing dehydration or dysphagia, anorexia, or pain interfering with the ability to eat/drink adequately;
 - > Significant comorbidities that may be aggravated by poor tolerance of dehydration, lack of caloric intake, or difficulty swallowing necessary medications;
 - > Severe aspiration; or mild aspiration in elderly patients or in patients who have compromised cardiopulmonary function; or
 - > Patients for whom long-term swallowing disorders are likely, including those anticipated to receive large fields of high-dose radiation to the mucosa and adjacent connective tissues. However, consideration of other risk factors for swallowing dysfunction must be taken into account as well.
- To maintain swallowing function during and following treatment (eg, radiation), patients who may have feeding tube placement should be encouraged to intake orally if they can swallow without aspiration or any other compromises. Alterations in swallowing function can occur long after treatment (especially after radiation-based treatment) and should be monitored for the lifetime of the patient.

¹Ehrsson YT, Langius-Eklöf A, Laurell G. Nutritional surveillance and weight loss in head and neck cancer patients. *Support Care Cancer* 2012;20:757-765.

²Locher JL, Bonner JA, Carroll WR, et al. Prophylactic percutaneous endoscopic gastrostomy tube placement in treatment of head and neck cancer: a comprehensive review and call for evidence-based medicine. *JPEN J Parenter Enteral Nutr* 2011;35:365-374.

³Langius JA, van Dijk AM, Doornaert P, et al. More than 10% weight loss in head and neck cancer patients during radiotherapy is independently associated with deterioration in quality of life. *Nutr Cancer* 2013;65:76-83.

Version 2.2013 © National Comprehensive Cancer Network, Inc. 2013. All rights reserved. The NCCN Guidelines® and this illustration may not be reproduced in any form without the express written permission of NCCN®.

NUTR-A
2 of 2

based treatments and should receive dietary counseling before treatment. Dysphagia, odynophagia, xerostomia, and dysgeusia are common complications contributing to nutrition problems.^{1,2,4-10} Surgery can lead to functional impairment regarding chewing and swallowing; chemotherapy is often associated with oral mucositis, nausea, and vomiting.¹

Patients with head and neck cancers who have had significant weight loss (>10% ideal body weight) clearly need nutritional evaluation and close monitoring of their weight to prevent further loss.^{4,11} Therefore, patients should receive nutritional evaluation before and after treatment to assess the need for interventions (eg, enteral support via feeding tubes).^{12,13} Some patients may require ongoing follow-up if they have chronic nutritional problems. Patients are also at risk for problems with speech. Treatment and/or the progression of their disease may cause deterioration in their ability to speak and/or swallow.⁶ Patients have reported that swallowing disorders negatively

affect their quality of life.⁹ Evaluation by a speech-language/swallowing specialist can help mitigate potential problems, including rehabilitation of speech in patients after total laryngectomy (eg, esophageal speech, tracheoesophageal puncture).¹⁴⁻¹⁶

Progress in radiation and surgical techniques has led to a decrease in the local side effects associated with treatment. For example, intensity-modulated radiation therapy maintains tumor control while decreasing radiation dosing to sites not at risk for cancer involvement, and has been shown to decrease dry mouth after treatment.¹⁷ Minimally invasive surgical technology (endoscopes, robots, lasers) facilitates complete removal of primary aerodigestive tract tumors, which can be accessed entirely through the mouth under anesthesia.¹⁸⁻²² When applicable, these surgical techniques result in fewer tracheotomies, shorter postsurgical hospital days, and more rapid resumption of swallowing than conventional surgical approaches.

Head and Neck Cancers, Version 2.2013

Although clinically significant esophageal constriction or stricture is infrequent after treatment with modern radiation techniques, it nonetheless can occur, particularly in patients with primary tumors of the hypopharynx. When esophageal constriction or stricture is present, esophageal dilation can alleviate related dysphagia. In rare cases of complete esophageal obstruction, an anterograde/retrograde approach may be warranted, and referral to a center with this expertise should be strongly considered.

Feeding Tubes

The NCCN Head and Neck Panel agrees that reactive feeding tube placement is appropriate in selected patients with head and neck cancers.^{1,13} However, the panel had varying opinions regarding the indications for prophylactic tube placement, although this is commonly performed if high-risk patients will be receiving intense multimodality therapy (eg, concurrent chemoradiation) that is anticipated to cause severe swallowing problems.^{1,9,11} The NCCN Guidelines provide recommendations for prophylactic tube placement, which should be strongly considered in high-risk patients (eg, those with severe pretreatment weight loss, ongoing dehydration or dysphagia, significant comorbidities, severe aspiration, anticipated posttreatment problems) (see NUTR-A, pages 919 and 920). The NCCN Guidelines do not recommend prophylactic tube placement in lower-risk patients (eg, those without significant pretreatment weight loss, significant aspiration, or severe dysphagia), although these patients must carefully monitor their weight.

Percutaneous endoscopic gastrostomy (PEG) tube feeding is useful for patients with swallowing disorders and those who need prolonged nutritional support.^{23–25} The amount of weight loss is significantly reduced in patients who undergo prophylactic PEG tube placement; however, complications may occur.^{1,26–28} PEG tubes can lead to infection, aspiration pneumonia, and decreased quality of life.^{29,30} Although patients prefer PEG over nasogastric tubes, they can become dependent on PEG tubes.^{26,27,31,32} More-advanced disease, altered fractionation, and concurrent chemoradiation are associated with a greater dependence on PEG tubes in patients with oropharyngeal cancer.³² A recent analysis among patients with swallowing disturbances indicates that

mortality rates and pneumonia are similar between the different types of feeding tubes (eg, PEG vs nasogastric tubes); the authors reported that PEG tube feeding seemed to be more effective and as safe as nasogastric tube feeding.²³ However, for patients with head and neck cancer, which is the optimal type of feeding tube is unclear.³³

Conclusions

These NCCN Guidelines Insights focus on nutrition and supportive care for patients with head and neck cancers. Multidisciplinary evaluation is integral to minimizing or decreasing weight loss and speaking and/or swallowing disturbances, and should involve a registered dietitian and a speech-language/swallowing therapist. The NCCN Guidelines provide recommendations for prophylactic feeding tube placement, which should be strongly considered in high-risk patients (eg, those with severe pretreatment weight loss, ongoing dehydration or dysphagia, significant comorbidities, severe aspiration, or anticipated posttreatment problems) (see NUTR-A, pages 919 and 920). The NCCN Guidelines do not recommend prophylactic feeding tube placement in lower-risk patients (eg, those without significant pretreatment weight loss, significant airway obstruction, or severe dysphagia), although these patients must carefully monitor their weight (to view the most recent version of these guidelines, visit the NCCN Web site at NCCN.org).

References

1. Locher JL, Bonner JA, Carroll WR, et al. Prophylactic percutaneous endoscopic gastrostomy tube placement in treatment of head and neck cancer: a comprehensive review and call for evidence-based medicine. *JPEN J Parenter Enteral Nutr* 2011;35:365–374.
2. Machtay M, Moughan J, Farach A, et al. Hypopharyngeal dose is associated with severe late toxicity in locally advanced head-and-neck cancer: an RTOG analysis. *Int J Radiat Oncol Biol Phys* 2012;84:983–989.
3. Nugent B, Parker MJ, McIntyre IA. Nasogastric tube feeding and percutaneous endoscopic gastrostomy tube feeding in patients with head and neck cancer. *J Hum Nutr Diet* 2010;23:277–284.
4. Langius JA, van Dijk AM, Doornaert P, et al. More than 10% weight loss in head and neck cancer patients during radiotherapy is independently associated with deterioration in quality of life. *Nutr Cancer* 2013;65:76–83.
5. Ehrsson YT, Langius-Eklöf A, Laurell G. Nutritional surveillance and weight loss in head and neck cancer patients. *Support Care Cancer* 2012;20:757–765.

Head and Neck Cancers, Version 2.2013

6. Tschiesner U. Preservation of organ function in head and neck cancer. *GMS Curr Top Otorhinolaryngol Head Neck Surg* 2012;11:Doc07.
7. Lee JH, Machtay M, Unger LD, et al. Prophylactic gastrostomy tubes in patients undergoing intensive irradiation for cancer of the head and neck. *Arch Otolaryngol Head Neck Surg* 1998;124:871–875.
8. Beaver ME, Matheny KE, Roberts DB, Myers JN. Predictors of weight loss during radiation therapy. *Otolaryngol Head Neck Surg* 2001;125:645–648.
9. Langendijk JA, Doornaert P, Verdonck-de Leeuw IM, et al. Impact of late treatment-related toxicity on quality of life among patients with head and neck cancer treated with radiotherapy. *J Clin Oncol* 2008;26:3770–3776.
10. Ottosson S, Zackrisson B, Kjellen E, et al. Weight loss in patients with head and neck cancer during and after conventional and accelerated radiotherapy. *Acta Oncol* 2013;52:711–718.
11. August DA, Huhmann MB. A.S.P.E.N. clinical guidelines: nutrition support therapy during adult anticancer treatment and in hematopoietic cell transplantation. *JPEN J Parenter Enteral Nutr* 2009;33:472–500.
12. Garg S, Yoo J, Winquist E. Nutritional support for head and neck cancer patients receiving radiotherapy: a systematic review. *Support Care Cancer* 2010;18:667–677.
13. Rabeneck L, McCullough LB, Wray NP. Ethically justified, clinically comprehensive guidelines for percutaneous endoscopic gastrostomy tube placement. *Lancet* 1997;349:496–498.
14. Xi S. Effectiveness of voice rehabilitation on vocalisation in postlaryngectomy patients: a systematic review. *Int J Evid Based Healthc* 2010;8:256–258.
15. Singer S, Wollbruck D, Dietz A, et al. Speech rehabilitation during the first year after total laryngectomy. *Head Neck*, in press.
16. Robinson HF. International practice of laryngectomy rehabilitation. *Curr Opin Otolaryngol Head Neck Surg* 2013;21:185.
17. Nutting CM, Morden JP, Harrington KJ, et al. Parotid-sparing intensity modulated versus conventional radiotherapy in head and neck cancer (PARSPORT): a phase 3 multicentre randomised controlled trial. *Lancet Oncol* 2011;12:127–136.
18. Weinstein GS, O'Malley BW Jr, Magnuson JS, et al. Transoral robotic surgery: a multicenter study to assess feasibility, safety, and surgical margins. *Laryngoscope* 2012;122:1701–1707.
19. Arens C. Transoral treatment strategies for head and neck tumors. *GMS Curr Top Otorhinolaryngol Head Neck Surg* 2012;11:Doc05.
20. Dowthwaite SA, Franklin JH, Palma DA, et al. The role of transoral robotic surgery in the management of oropharyngeal cancer: a review of the literature. *ISRN Oncol* 2012;2012:945162.
21. Adelstein DJ, Ridge JA, Brizel DM, et al. Transoral resection of pharyngeal cancer: summary of a National Cancer Institute Head and Neck Cancer Steering Committee Clinical Trials Planning Meeting, November 6–7, 2011, Arlington, Virginia. *Head Neck* 2012;34:1681–1703.
22. Li RJ, Richmon JD. Transoral endoscopic surgery: new surgical techniques for oropharyngeal cancer. *Otolaryngol Clin North Am* 2012;45:823–844.
23. Gomes CA Jr, Lustosa SA, Matos D, et al. Percutaneous endoscopic gastrostomy versus nasogastric tube feeding for adults with swallowing disturbances. *Cochrane Database Syst Rev* 2012;3:CD008096.
24. Wiggenraad RG, Flierman L, Goossens A, et al. Prophylactic gastrostomy placement and early tube feeding may limit loss of weight during chemoradiotherapy for advanced head and neck cancer, a preliminary study. *Clin Otolaryngol* 2007;32:384–390.
25. Raykher A, Correa L, Russo L, et al. The role of pretreatment percutaneous endoscopic gastrostomy in facilitating therapy of head and neck cancer and optimizing the body mass index of the obese patient. *JPEN J Parenter Enteral Nutr* 2009;33:404–410.
26. Chen AM, Li BQ, Lau DH, et al. Evaluating the role of prophylactic gastrostomy tube placement prior to definitive chemoradiotherapy for head and neck cancer. *Int J Radiat Oncol Biol Phys* 2010;78:1026–1032.
27. Mekhail TM, Adelstein DJ, Rybicki LA, et al. Enteral nutrition during the treatment of head and neck carcinoma: is a percutaneous endoscopic gastrostomy tube preferable to a nasogastric tube? *Cancer* 2001;91:1785–1790.
28. Lawson JD, Gaultney J, Saba N, et al. Percutaneous feeding tubes in patients with head and neck cancer: rethinking prophylactic placement for patients undergoing chemoradiation. *Am J Otolaryngol* 2009;30:244–249.
29. Cheng SS, Terrell JE, Bradford CR, et al. Variables associated with feeding tube placement in head and neck cancer. *Arch Otolaryngol Head Neck Surg* 2006;132:655–661.
30. Terrell JE, Ronis DL, Fowler KE, et al. Clinical predictors of quality of life in patients with head and neck cancer. *Arch Otolaryngol Head Neck Surg* 2004;130:401–408.
31. McLaughlin BT, Gokhale AS, Shuai Y, et al. Management of patients treated with chemoradiotherapy for head and neck cancer without prophylactic feeding tubes: the University of Pittsburgh experience. *Laryngoscope* 2010;120:71–75.
32. Garden AS, Kies MS, Morrison WH, et al. Outcomes and patterns of care of patients with locally advanced oropharyngeal carcinoma treated in the early 21st century. *Radiat Oncol* 2013;8:21.
33. Nugent B, Lewis S, O'Sullivan JM. Enteral feeding methods for nutritional management in patients with head and neck cancers being treated with radiotherapy and/or chemotherapy. *Cochrane Database Syst Rev* 2010:CD007904.

Head and Neck Cancers, Version 2.2013

Instructions for Completion

To participate in this journal CE activity: 1) review the learning objectives and author disclosures; 2) study the education content; 3) take the posttest with a 66% minimum passing score and complete the evaluation at <http://education.nccn.org/node/27285>; and 4) view/print certificate. After reading the article, you should be able to answer the following multiple-

choice questions. Credit cannot be obtained for tests completed on paper. You must be a registered user on NCCN.org. If you are not registered on NCCN.org, click on "New Member? Sign up here" link on the left hand side of the Web site to register. Only one answer is correct for each question. Once you successfully answer all posttest questions you will be able to view and/or print your certificate. Software requirements: Internet.

Posttest Questions

1. Prophylactic feeding tube placement should be considered in patients with head and neck cancers who are at high risk for severe weight loss.
 - a. True
 - b. False
2. Which of the following suggest that patients with head and neck cancer may be at high risk for severe weight loss?
 - a. Ongoing dehydration or dysphagia
 - b. Treatment with concurrent chemoradiation
 - c. Severe aspiration
 - d. All of the above
 - e. None of the above
3. After total laryngectomy, evaluation by a speech language/swallowing specialist can help patients to rehabilitate their speech.
 - a. True
 - b. False

