Promoting TNM-Stage Use & Ensuring Stage is Globally Relevant

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• University of Hong Kong - Shenzhen Hospital
Disclosure

I have
No conflict of interest
to declare
Appropriate Staging - a Fundamental Step in Cancer Care
Objectives of Staging

• To aid clinician in planning of treatment
• To give indications of prognosis
• To assist in evaluation of results
• To support cancer control activities
• To enable sharing of experience
• To contribute to continuing research
Estimated Cancer Incidence Worldwide in 2012

Men

Women

Age-standardized rates (World) per 100,000

Globocan 2012 (IARC)
Estimated Age-Standardized Rates (World) per 100,000

Globocan 2012 (IARC)
All Cancers: Estimated Incidence & Mortality Worldwide in 2012

Total No. of New Cases: 14090
- More developed: 57%
- Less developed: 43%

Total No. of Deaths: 8201
- More developed: 65%
- Less developed: 35%

Globocan 2012 (IARC)
Cancers Specifically Prevalent in Asia

Stomach

Liver

Esophagus

Nasopharynx

Globocan 2012 (IARC)
TNM-Stage
Must be
Globally Relevant
GUEST EDITORIAL

The TNM System: Our Language for Cancer Care

FREDERICK L. GREENE, MD1* AND LESLIE H. SOBIN, MD2

1Chairman, The American Joint Committee on Cancer (AJCC)
2Chairman, TNM Project Committee, International Union Against Cancer (UICC)
TNM Organization

Union for International Cancer Control
BOD and SCC

TNM Prognostic Factors Operation

TNM Prognostic Factors Core Group

- Prognostic Factors Task Force
- TNM Global Advisory Group
- TNM Atlas Editorial Group
- TNM Classification Editors
- TNM Supplement Editors

TNM Expert Panels

TNM National Committees
Structured Literature Review

Improving the TNM classification: Findings from a 10-year continuous literature review

Colleen Webber¹,², Mary Gospodarowicz³, Leslie H. Sobin⁴, Christian Wittekind⁵, Frederick L. Greene⁶, Malcolm D. Mason⁷, Carolyn Compton⁸,⁹, James Brierley³ and Patti A Groome¹,²

What’s new?

The Union for International Cancer Control’s TNM classification undergoes periodic revisions to incorporate current knowledge of anatomic extent of disease and its relationship with patient management and prognosis. This article describes the results of an annual literature review process that was implemented in 2002 to inform revisions to the classification. Since that time, more than 770 articles have been reviewed, with the number of articles reviewed increasing over time, reflecting growing research interest in cancer staging and new developments in cancer diagnosis. The report suggests that the literature review process has enhanced recent changes to the TNM classification.
International Expert Panels

- Expert panels
  - expertise judged by publications, engagement in clinical trial groups
  - Multidisciplinary, international
  - involved in the evaluation of the annual literature search

Since 2002
147 panel members on 11 cancer sites
Review >770 articles

Webber IJC 2014
Publications on TNM-stage

- TNM on-line
- TNM Palm edition
Prognostic Factor Task Force

Publications on prognostic factors

- Literature review
- Pragmatic classification
- Evidence supported
My Journey in Developing Global TNM-System for Nasopharyngeal Cancer & Embracing China into the Global Advisory Group
Incidence of NPC: Global Distribution

Source: GLOBOCAN 2012 (IARC)
NPC: Disease Burden by Continents

Estimated No. for both sex, all ages

New cases
Total 86691

Deaths
Total 50828

Globocan 2012
NPC: Disease Burden by Countries

Estimated No. for both sex, all ages

New cases: Total 86691

Deaths: Total 50828

Top 4: China, Indonesia, Vietnam, India → 64% of global burden

Globocan 2012
Staging Systems for NPC before 1997

AJCC & UICC: same system as other Head & Neck Cancers

Customized Systems in Different Regions

**West**
- Geist & Porter 1952
- Perez 1969
- Chen & Fletcher 1971
- Moench & Philips 1972
- De The & Ito 1978
- Neel & Taylor 1989

**East**
- Ho 1970, 78
- Huang 1980
- Li et al. 1983
- Teo et al. 1991
- Min et al. 1994
Better Hazard Distinction by Stages

AJCC / UICC 5th Edition
Customized system by combining strengths of Ho’s System & AJCC / UICC 4th Ed

Disease-Specific Survival

Year

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

0 2 4 6 8 10

I II III IV

Year

0 2 4 6 8 10

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

I II III IV

4th Ed

5th Ed

Lee IJC 1999
### AJCC/UICC 5-6th Ed Data Supporting Global Relevance

<table>
<thead>
<tr>
<th>Author</th>
<th>Origin</th>
<th>Period</th>
<th>Staging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lee</td>
<td>Hong Kong</td>
<td>1976-85</td>
<td>85% XR, 15% CT</td>
</tr>
<tr>
<td>Cooper</td>
<td>US</td>
<td>1971-94</td>
<td>NR</td>
</tr>
<tr>
<td>Hong</td>
<td>China</td>
<td>1987-88</td>
<td>All CT</td>
</tr>
<tr>
<td>Au</td>
<td>Hong Kong</td>
<td>1987-90</td>
<td>All CT</td>
</tr>
<tr>
<td>Chua</td>
<td>Hong Kong</td>
<td>1989-91</td>
<td>All CT</td>
</tr>
<tr>
<td>Heng</td>
<td>Singapore</td>
<td>1992-94</td>
<td>All CT</td>
</tr>
<tr>
<td>Ma</td>
<td>China</td>
<td>1993-94</td>
<td>All CT</td>
</tr>
<tr>
<td>Ozyar</td>
<td>Turkey</td>
<td>1993-97</td>
<td>All CT (±MRI)</td>
</tr>
<tr>
<td>Casanova</td>
<td>Italy</td>
<td>1965-99</td>
<td>NR</td>
</tr>
</tbody>
</table>
Continual Improvement of TNM Staging From 5-6th to 7th Edition

Proposal from Hong Kong

T2a → T1, Stage IIA → I

4514 pt. x-ray 85%, CT 15%
2D RT

Lee, IJC 1999

2687 pt. CT 38%, MR 32%
2D RT

Lee, Clin Oncol 2004

Proposal from China

Retropharyngeal LN Irrespective of laterality → N1

Lee, IJC 1999
International Treatment Guideline - by TNM-stage

Cancer of the Nasopharynx

CLINICAL STAGING

T1, N0, M0 → Definitive RT to nasopharynx and elective RT to neck
e
Concurrent chemo/RT followed by adjuvant chemotherapy
or
Concurrent chemo/RT not followed by adjuvant chemotherapy (category 2B)
or
Induction chemotherapy (category 3) followed by chemo/RT
e
Any T, any N, M1 → Platinum-based combination chemotherapy
Concurrent chemo/RT
e

T1, N1-3; T2-T4, any N →
Concurrent chemo/RT not followed by adjuvant chemotherapy (category 2B)
or
Induction chemotherapy (category 3) followed by chemo/RT
e

FOLLOW-UP

Neck: Residual tumor → Neck dissection
Neck: Complete clinical response → Observe
RT to primary and neck or Chemo/RT as clinically indicated
Neck dissection
Follow-up (See FOLL-A)
Recurrent or Persistent Disease (See ADV-2)
### Nasopharyngeal cancer: EHNS–ESMO–ESTRO Clinical Practice Guidelines for diagnosis, treatment and follow-up

A.T.C. Chan¹, V. Grégoire², J.-L. Lefebvre³, L. Licitra⁴, E.P. Hui¹, S.F. Leung¹ & E. Felip⁵, on behalf of the EHNS–ESMO–ESTRO Guidelines Working Group*

<table>
<thead>
<tr>
<th>Stage</th>
<th>Early stage</th>
<th>Intermediate stage</th>
<th>Advanced stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation alone</td>
<td>Stage I</td>
<td>Stage II</td>
<td>Stage III, IVA,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IVB, IVA,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IVB</td>
</tr>
<tr>
<td>Concurrent chemoradiotherapy</td>
<td>(I, B)</td>
<td></td>
<td>Concurrent chemoradiotherapy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+/- adjuvant chemotherapy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(I, A)</td>
</tr>
<tr>
<td>Induction chemotherapy</td>
<td></td>
<td></td>
<td>followed by concurrent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>chemoradiotherapy (II, B)</td>
</tr>
</tbody>
</table>

*Please note that the clinical practice guidelines should be interpreted in the context of the latest medical evidence and patient-specific factors.*
Continual Improvement of Staging for NPC
Suggestions for AJCC/UICC 8th Ed

The strength/weakness of the AJCC/UICC staging system (7th edition) for nasopharyngeal cancer and suggestions for future improvement


Department of Clinical Oncology, Pamela Youde Nethersole Eastern Hospital, Hong Kong, China

Comparison of TNM staging systems for nasopharyngeal carcinoma, and proposal of a new staging system

P.Y. OuYang1, Z Su1, X-H Ma2, Y-P Mao1, M-Z Liu*,1,3 and F-Y Xia*,1,3

1Department of Radiation Oncology, Sun Yat-sen University Cancer Center, State Key Laboratory of Oncology in South China, Collaborative Innovation Center for Cancer Medicine, No. 651 Dongfang Road East, Guangzhou S10060, Guangdong, China and
2Department of Medical Statistics and Epidemiology, School of Public Health, Sun Yat-sen University, Guangzhou, Guangdong, China

Keywords: comparison; evaluation; magnetic resonance imaging; nasopharyngeal carcinoma; staging system

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BJC

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2Department of Medical Statistics and Epidemiology, School of Public Health, Sun Yat-sen University, Guangzhou, Guangdong, China
A Major Problem to Resolve

Different Staging Systems
In China
Particularly for
Asian prevalent cancers
## Staging Systems in Mainland China

Survey by GL Jiang in 2010

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>UICC/AJCC</th>
<th>Chinese</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Breast</td>
<td>95</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Colorectal</td>
<td>90</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Prostate</td>
<td>95</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Gynecology</td>
<td>10</td>
<td>0</td>
<td>90 (FIGO)</td>
</tr>
<tr>
<td>Nasopharynx</td>
<td>81</td>
<td>52</td>
<td>0</td>
</tr>
<tr>
<td>Liver</td>
<td>80</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Stomach</td>
<td>95</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>Esophagus</td>
<td>100</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>70</td>
<td>25</td>
<td>5</td>
</tr>
</tbody>
</table>
**TABLE 1. Staging Systems for Nasopharyngeal Carcinoma**

<table>
<thead>
<tr>
<th>The Seventh Edition of the AJCC Staging System</th>
<th>The Chinese 2008 Staging System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T-primary tumor</strong></td>
<td><strong>T-primary tumor</strong></td>
</tr>
<tr>
<td>T1 Nasopharynx, oropharynx, or nasal cavity extension</td>
<td>T1 Tumor confined to nasopharynx</td>
</tr>
<tr>
<td>T2 Parapharyngeal extension</td>
<td>T2 [Nasal cavity, oropharynx] parapharyngeal extension</td>
</tr>
<tr>
<td>T3 Bony structure, paranasal sinuses extension</td>
<td>T3 Skull base, medial pterygoid muscle extension</td>
</tr>
<tr>
<td>T4 Intracranial extension, cranial nerve, hypopharynx, orbit, infratemporal fossa (masticatory space) extension</td>
<td>T4 Cranial nerve, paranasal sinus, masticatory space excluding medial pterygoid muscle, intracranial (cavernous, dural meninges) extension</td>
</tr>
<tr>
<td><strong>N-regional lymph nodes</strong></td>
<td><strong>N-regional lymph nodes</strong></td>
</tr>
<tr>
<td>N0 No regional lymph node metastasis</td>
<td>N0 No regional lymph node metastasis</td>
</tr>
<tr>
<td>N1 Unilateral metastasis in lymph node(s), uni/bilateral</td>
<td>N1a Retropharyngeal lymph node involvement</td>
</tr>
<tr>
<td>retropharyngeal lymph node, ≤6 cm in greatest dimension, above the supraclavicular fossa</td>
<td>N1b Unilateral [level I b, II, III, and V a] involvement and the maximum diameter ≤3 cm</td>
</tr>
<tr>
<td>N2 Unilateral metastasis in lymph node(s), ≤6 cm in greatest dimension, above the supraclavicular fossa involvement</td>
<td>N2 Bilateral [level I b, II, III, and V a] or the maximum diameter &gt;3 cm or with extranodal neoplastic spread</td>
</tr>
<tr>
<td>N3a &gt;6 cm in greatest dimension</td>
<td>N3 [Level IV, V b] involvement</td>
</tr>
<tr>
<td>N3b Extension to the supraclavicular fossa</td>
<td><strong>M-distant metastasis</strong></td>
</tr>
<tr>
<td><strong>M-distant metastasis</strong></td>
<td>M0 No distant metastasis</td>
</tr>
<tr>
<td>M0 No distant metastasis</td>
<td>M1 Distant metastasis</td>
</tr>
<tr>
<td>M1 Distant metastasis</td>
<td><strong>Stage grouping</strong></td>
</tr>
<tr>
<td><strong>Stage grouping</strong></td>
<td>Stage I: T1 N0 M0</td>
</tr>
<tr>
<td>Stage I: T1 N0 M0</td>
<td>Stage II: T1 N1a-1b M0, T2 N0-1b M0</td>
</tr>
<tr>
<td>Stage II: T1 N1 M0, T2 N0-1 M0</td>
<td>Stage III: T1-2 N2 M0, T3 N0-2 M0</td>
</tr>
<tr>
<td>Stage III: T1-2 N2 M0, T3N0-2 M0</td>
<td>Stage [IV a] T1-3N3M0</td>
</tr>
<tr>
<td>Stage IVA: T4 N0-2 M0</td>
<td>Stage IVb: Any T Any N M1</td>
</tr>
<tr>
<td>Stage IVb: Any T N3 M0</td>
<td>Stage IVc: Any T Any N M1</td>
</tr>
</tbody>
</table>
Chinese 2008 System vs AJCC/UICC 7th Ed

**Local control**
AJCC/UICC - T better

**Distant control**
Chinese - N better

**Overall survival**
Both – stage group same

Pan AJCO 2013
Global Advisory Group

- Leaders of National Cancer Staging Committees
- Communication with the Core TNM Project Committee
- Dissemination of cancer staging concepts
- Dissemination of the current edition of the TNM classification
- Education about cancer staging
- Engagement of cancer registries in staging
Attempts to Create a National TNM Staging Committee in China

Preparatory Committee
August 2010
Engaging All Key Professionals

- Academic exchange to develop best staging system
- Advocacy for national & international unification
To establish National Committee in China

Getting Government Recognition/ Support

Invitation by UICC  *(Mar 2010)*

Preparatory Committee  *(Aug 2010)*

Approval by **Chinese Anti-Cancer Association**

Approval by **China Association for Science & Technology**

Application by **Chinese Anti-Cancer Association**

Approval by **Ministry of Civil Affairs**

**Inauguration of National TNM Cancer Staging Committee**  *(Oct 2013)*
Inauguration of National TNM Cancer Staging Committee (Shanghai, Oct 2013)
Mandate of a National Committee on Cancer Staging

- Proactive promotion of the use of the internationally accepted staging system (UICC TNM) in the country/region
- Dissemination of information about the current TNM classification including translation
- Stimulating awareness, building knowledge, and facilitating the implementation of universal recording of cancer staging
- Providing evidence-based expert opinion on the development and enhancement of staging and prognostic factors classification through its own efforts or with the assistance of additional qualified experts
Staging & Cancer Care

Advocating globally-relevant evidence-based cancer staging system

- Educating/ engaging all key professionals
- Engaging all states in setting national staging strategy
- Integrating staging strategy with cancer registry
- Getting government recognition & support

Concerted Efforts by All