Head & Neck Updates in Clinical Management and Perspective

Saad A. Khan, MD
UT Southwestern Hematology and Oncology
April 14, 2018
Southwest Chapter-SNMMI
Outline

- Overview
- Human papillomavirus
- Staging
- Metastatic/Recurrent Disease
- Adjuvant therapy and future directions
Incidence and Etiology

- 65,000 estimated new cases in 2017
- 13,700 estimated deaths in 2017
- Squamous cell carcinoma accounts for >90%
  - 10%: neuroendocrine/SNUC /esthesioneuroblastoma/ unclassified
- Tobacco and EtOH use
  - Aerodigestive tract epithelium is exposed
    - Oral cavity, oropharynx, hypopharynx, larynx
LIFE

HPV May Be Setting The Stage For A Millennial Cancer Epidemic

#HEALTH

BY: DAN SEITZ
SENIOR CONTRIBUTOR

NEWS

A Silent Epidemic of Cancer Is Spreading Among Men

Almost everyone gets this virus and oral sex spreads it.

HPV

- Human Papillomavirus

  - Established risk factor, smoking can still contribute

  - Oropharynx primaries
    - Lingual and palatine tonsils
    - Base of tongue

  - Incidence of HPV-associated cancer increasing (60-70%) while HPV-negative (ie, smoker-drinker) cancer is decreasing
HPV associated OPC

Demographics

- Younger patients, average 5 years
- M > W
- Limited tobacco and Etoh exposure
- Lingual and palatine tonsils
HPV pathogenesis

- High risk types (HPV-16 & -18) have transforming potential in tonsillar tissue

- Viral oncoproteins E6 & E7
  - E6 inactivates p53
  - E7 inactivates pRb, upregulates p16

- Results in cell proliferation, loss of cell cycle regulation and differentiation
HPV associated OPC

- RTOG 0129 and RTOG 0522 were phase III clinical trials designed to evaluate effectiveness of different types of radiation
  - (Cisplatin + RT) AXF-C vs SFX
  - No difference in types of radiation

- After completion of these studies, comparison of outcomes separated by p16+/- done as a retrospective

Fakhry et al, JCO 2014
Fig 2. Kaplan-Meier estimates of **overall survival** after disease progression for patients with p16-positive and p16-negative oropharyngeal carcinoma (OPC). Patients with p16-positive OPC had significantly better overall survival after disease progression than patients with p16-negative OPC ($P < .001$). The 2-year rates of overall survival after disease progression were 54.6% for patients with p16-positive OPC (95% CI, 44.9 to 64.4) and 27.6% for patients with p16-negative OPC (95% CI, 17.3 to 37.9).
Fig 3. Kaplan-Meier estimates of overall survival after disease progression for patients with p16-positive and p16-negative oropharyngeal carcinoma (OPC) who had (A) locoregional progression, (B) distant metastases, (C) salvage surgery, and (D) no salvage surgery. Patients with p16-positive OPC had significantly better overall survival after disease progression than patients with p16-negative OPC in the subgroups that had locoregional failure (P < .001), distant metastases (P = .04), salvage surgery (P = .004), and no salvage surgery (P = .003).

Published in: Carole Fakhry; Qiang Zhang; Phuc Felix Nguyen-Tan; David Rosenthal; Adel El-Naggar; Adam S. Garden; Denis Soulieres; Andy Trotti; Vilija Avizonis; John Andrew Ridge; Jonathan Harris; Quynh-Thu Le; Maura Gillison; JCO 2014, 32, 3365-3373.
DOI: 10.1200/JCO.2014.55.1937
Copyright © 2014
Head and Neck Cancer

**Oropharynx**
- Base of tongue
- Soft palate
- Tonsillar pillar and fossa

**Larynx**
- Supraglottis
- False cords
- Arytenoids
- Epiglottis
- Arytenoepiglottic fold

**Glottis**
- Subglottis

**Lip**
- Buccal mucosa
- Alveolar ridge and retromolar trigone
- Floor of mouth
- Hard palate
- Oral tongue (anterior two thirds)
Breakdown of Disease-Special Cases

- **Nasopharyngeal Cancer**
  - Staged differently, chemotherapy regimen differ, associated with EBV in most cases
  - All HNC staging now updated!

- **Oropharyngeal, hypopharynx, oral cavity**

- **Larynx cancer**
  - Focused on functional organ preservation
Overview - Principles

Localized Disease
Stage I or II
- Surgery or Radiation

Locoregionally Advanced
Stage III-IVA
- Surgery or Radiation
  - Adjuvant Radiation
  - +/- Chemotherapy
  - Induction Chemotherapy
  - Definitive Chemoradiation
  - Definitive Chemoradiation

Metastatic or Recurrent
- Palliative Chemotherapy
  - Salvage Surgery/Radiation.
Simplified Staging (T)

Nasopharynx

- T1: confined to nasopharynx
- T2a: extension into soft tissue of oropharynx/nasal cavity
- T2b: parapharyngeal extension
- T3: involvement of bone or paranasal sinuses
- T4: intracranial extension
Simplified Staging (T)

Oral Cavity, Oropharynx, Hypopharynx

- **T1:** ≤ 2 cm
- **T2:** > 2 cm and ≤ 4 cm
- **T3:** > 4 cm (OC)
  - or fixation of hemilarynx (HP)
  - or extension to lingual surface (OP)
- **T4:** invasion of deep muscle or bone or other structures in the neck
  - **T4a & T4b**
Simplified Staging (T)

Larynx (VERY SIMPLIFIED!!!!)

- T1: one subsite; normal mobility
- T2: >1 subsite; normal mobility
- T3: limited to larynx, cord fixation
- T4: extension beyond larynx
  - T4a & T4b

Subsites: mucosa of base of tongue, vallecula, medial wall of pyriform sinus
Staging (N,M) Nasopharyngeal

- **N0**: No involvement
- **N1**: unilateral node(s) ≤6 cm above supraclavicular fossa
- **N2**: bilateral node(s) ≤6 cm above supraclavicular fossa
- **N3a**: any node >6 cm
- **N3b**: extension to supraclavicular fossa

- **M0**: No Distant Metastasis
- **M1**: Distant Metastasis
Staging (N,M) OC, OP, HP

- **N0**: No involvement
- **N1**: single ipsilateral node ≤3 cm
- **N2a**: single ipsilateral node >3 cm and ≤6 cm
- **N2b**: multiple ipsilateral nodes all ≤6 cm
- **N2c**: bilateral/contralateral node ≤6 cm
- **N3**: any node >6 cm

- **M0**: No Distant Metastasis
- **M1**: Distant Metastasis
### Nasopharynx
- **I:** T1 N0
- **II:** T1 N1, T2 N0-1
- **III:** T3 N0-2, T1-2 N2
- **IVA:** T4 N0-2 M0
- **IVB:** T(any)N3 M0
- **IVC:** M1

### OC, OP, HP
- **I:** T1 N0
- **II:** T2 N0
- **III:** T3 N0, T1-3 N1
- **IVA:** T4a N0-2 M0, T1-3, N2, M0
- **IVB:** T4b N0-3 M0, T(any) N3 M0
- **IVC:** M1
Simplified Prognosis

<table>
<thead>
<tr>
<th>Stage</th>
<th>Cases</th>
<th>5-year Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>15%</td>
<td>85%</td>
</tr>
<tr>
<td>Stage II</td>
<td>20%</td>
<td>70%</td>
</tr>
<tr>
<td>Stage III</td>
<td>25%</td>
<td>55%</td>
</tr>
<tr>
<td>Stage IV</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Unresectable</td>
<td>15%</td>
<td>&lt;10%</td>
</tr>
</tbody>
</table>
Multidisciplinary Care

- Advanced imaging
- Surgical oncology – advanced ENT trained
- Plastic and Cosmetic surgery
- Medical oncology
- Radiation oncology
- Speech Therapy
- Nutritional support
- Dental care specialists
- Endocrinology
- Smoking cessation/Behavioral Health support
- Audiology
Metastatic Disease

SWOG (Forastiere, JCO 1992; 10(8) 1245-51)

phase III, n=277

- 1st line locally recurrent or metastatic
- [Cisplatin 100 d1; 5FU 1000mg/m2/dx96h] q21d
  - vs. same w/ carboplatin 300mg/m2
  - vs. single agent MTX 40mg/m2 weekly

- Response Rate (32 v 21 v 10%)
- Med Overall Survival (6.6 v 5.0 v 5.6 mos NS)
- 9mo OS (31 v 30 v 27%)
Metastatic Disease

(Burtness, JCO 2005; 23(34) 8646-54) n=117

- 1st line recurrent and metastatic SCCA of head and neck ca
- Cis 100 q28d +/- Cetux (400 loading; 250 weekly)
- RR (26 v 10%, p=0.03)
- OS (9.2 v 8m, p=0.21)
- PFS (4.2 v 2.7m, p=0.09)
Overall Survival

Log Rank Test $p=0.18$

Treatment
- C + C225
- C + Placebo

Survival Percent
- Median = 9.19m
- Median = 7.96m

Time (Months)

Burtness, JCO 2005; 23(34) 8646-54
Metastatic Disease - Breakthrough!

- EXTREME (Vermorken, NEJM 2008; 359(11) 1116-27) phase III, n=442
  - (cis 100 or carbo AUC5)d1; 5FU 1000mg/m2/d d1-4] q21d
    - +/- Cetux (400 loading, then 200 weekly)
  - Med OS (10.1 v 7.4m) p=0.04
  - RR (36 v 20%)

- Other options with RR 10-30%
  - Methotrexate
  - Single Agent Cetuximab
  - Platinum Doublet (ie carboplatin + taxol)
  - Taxane
  - 5-FU
Metastatic Disease

Overall Survival

HR (95%CI): 0.797 (0.644, 0.986)
Strat. log-rank test: 0.0362

Vermorken, NEJM 2008; 359(11) 1116-27
Immune therapy era

For 10 years, no chemotherapy trial showed any improvement in advanced head and neck cancer....
Taking the Brakes off the Immune System

Metastatic Disease Therapies

- **Pembrolizumab (anti-PD-1)**
  - KEYNOTE – 012/055: Patients with recurrent or metastatic (R/M) head and neck squamous cell carcinoma (HNSCC) with disease progression on or after platinum-containing chemotherapy

- **Nivolumab (anti-PD-1)**
  - CheckMate – 141: Patients with R/M HNSCC with disease progression on or after a platinum-based therapy
KEYNOTE 12 Phase Ib Trial

R/M HNSCC PD-L1 +/-

Prim endpoint: ORR+ Safety

Pembro 10 mg/kg every 2 weeks n=60

Pembro 200 mg every 3 weeks n=132

Continue for up to 24 months

60 patients had HNC
Not every patient responds, but they can be durable
Progression free then overall survival

A

Overall population
- HPV-positive
- HPV-negative

B

Overall survival (%)

Number at risk
- Overall population
- HPV-positive
- HPV-negative

0 1 2 3 4 5 6 7 8 9 10 11 12 13

0 10 20 30 40 50 60 70 80 90 100

Number at risk

The Lancet Oncology 2016 17, 956-965 DOI: (10.1016/S1470-2045(16)30066-3)
KEYNOTE 55 Phase II Trial

R/M HNSCC PD-L1 +/-
Prim endpoint: ORR+ Safety

Pembro 200 mg every 3 weeks
n=171

Continue for up to 24 months
Survival analysis

Bauml, JCO 2017
Table 3. Antitumor Activity of Pembrolizumab

<table>
<thead>
<tr>
<th>Response Evaluation</th>
<th>All Patients* (N = 171)</th>
<th>HPV Positive† (n = 37)</th>
<th>HPV Negative† (n = 131)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>% (95% CI)‡</td>
<td>No.</td>
</tr>
<tr>
<td>Overall response rate</td>
<td>28</td>
<td>16 (11 to 23)</td>
<td>6</td>
</tr>
<tr>
<td>Complete response</td>
<td>1</td>
<td>1 (0 to 3)</td>
<td>0</td>
</tr>
<tr>
<td>Partial response</td>
<td>27</td>
<td>16 (11 to 22)</td>
<td>6</td>
</tr>
<tr>
<td>Stable disease</td>
<td>33</td>
<td>19 (14 to 26)</td>
<td>6</td>
</tr>
<tr>
<td>Progressive disease</td>
<td>87</td>
<td>51 (43 to 59)</td>
<td>21</td>
</tr>
<tr>
<td>Nonevaluable§</td>
<td>4</td>
<td>2 (1 to 6)</td>
<td>0</td>
</tr>
<tr>
<td>Data unavailable</td>
<td></td>
<td>19</td>
<td>11 (7 to 17)</td>
</tr>
</tbody>
</table>

NOTE. Confirmed responses per Response Evaluation Criteria in Solid Tumors, version 1.1, per central imaging vendor review.

Abbreviation: HPV, human papillomavirus.

*Patients who received one or more doses of pembrolizumab.
†HPV status determined using p16 immunohistochemistry for tumors of the oropharynx. Nonoropharyngeal tumors were considered HPV negative.
‡On the basis of binormal exact confidence interval method.
§Images were not evaluable.
|| Data were unavailable because of death or withdrawal from the study before the first scheduled scan.
Fig A2. Kaplan-Meier estimates of (A) progression-free survival and (B) overall survival by programmed death ligand 1 (PD-L1) status.
RANDOMIZED TRIAL ERA: CHECKMATE 141 PHASE 3

R/M HNSCC PD-L1 +/- PROGRESSED WITHIN 6 months of Chemo RT Nth line

**Prim endpoint:** OS

Nivo 3 mg/kg IV every 2 weeks n=240

- Methotrexate 40 mg/m² IV weekly
- Docetaxel 30 mg/m² IV weekly
- Cetuximab 400 mg/m² IV once, then 250 mg/m² weekly
  - n= 121

**Primary endpoint**
- OS

**Other endpoints**
- PFS
- ORR
- Safety
- DOR
- Biomarkers
- Quality of life
Overall Survival, Progression-free Survival (ORR 19%)

**A. Overall Survival**

<table>
<thead>
<tr>
<th></th>
<th>No. of Patients</th>
<th>No. of Deaths</th>
<th>1-Yr Overall Survival Rate % (95% CI)</th>
<th>Median Overall Survival mo (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nivolumab</td>
<td>240</td>
<td>133</td>
<td>36.0 (28.5–43.4)</td>
<td>7.5 (5.5–9.1)</td>
</tr>
<tr>
<td>Standard Therapy</td>
<td>121</td>
<td>85</td>
<td>16.6 (8.6–26.8)</td>
<td>5.1 (4.0–6.0)</td>
</tr>
</tbody>
</table>

Hazard ratio for death, 0.70 (97.73% CI, 0.51–0.96) P=0.01

**B. Progression-free Survival**

<table>
<thead>
<tr>
<th></th>
<th>No. of Patients</th>
<th>No. of Events</th>
<th>Median Progression-free Survival mo (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nivolumab</td>
<td>240</td>
<td>190</td>
<td>2.0 (1.9–2.1)</td>
</tr>
<tr>
<td>Standard Therapy</td>
<td>121</td>
<td>103</td>
<td>2.3 (1.9–3.1)</td>
</tr>
</tbody>
</table>

Hazard ratio for disease progression or death, 0.89 (95% CI, 0.70–1.13) P=0.32

No. at Risk

<table>
<thead>
<tr>
<th></th>
<th>Nivolumab</th>
<th>Standard Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>240</td>
<td>121</td>
</tr>
<tr>
<td>12 months</td>
<td>167</td>
<td>87</td>
</tr>
<tr>
<td>9 months</td>
<td>109</td>
<td>42</td>
</tr>
<tr>
<td>6 months</td>
<td>52</td>
<td>17</td>
</tr>
<tr>
<td>3 months</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>1 month</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

No. at Risk

<table>
<thead>
<tr>
<th></th>
<th>Nivolumab</th>
<th>Standard Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>240</td>
<td>121</td>
</tr>
<tr>
<td>12 months</td>
<td>79</td>
<td>43</td>
</tr>
<tr>
<td>9 months</td>
<td>32</td>
<td>9</td>
</tr>
<tr>
<td>6 months</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>3 months</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>1 month</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Overall Survival According to Baseline PD-L1 Status - PD-L1 negative still respond.

**A** Overall Survival among Patients with Baseline PD-L1 ≥1%

<table>
<thead>
<tr>
<th></th>
<th>No. of Patients</th>
<th>No. of Deaths</th>
<th>Median Overall Survival mo (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nivolumab</td>
<td>88</td>
<td>49</td>
<td>8.7 (5.7–9.1)</td>
</tr>
<tr>
<td>Standard Therapy</td>
<td>61</td>
<td>45</td>
<td>4.6 (3.8–5.8)</td>
</tr>
</tbody>
</table>

**B** Overall Survival among Patients with Baseline PD-L1 <1%

<table>
<thead>
<tr>
<th></th>
<th>No. of Patients</th>
<th>No. of Deaths</th>
<th>Median Overall Survival mo (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nivolumab</td>
<td>73</td>
<td>45</td>
<td>5.7 (4.4–12.7)</td>
</tr>
<tr>
<td>Standard Therapy</td>
<td>38</td>
<td>25</td>
<td>5.8 (4.0–9.8)</td>
</tr>
</tbody>
</table>

Hazard ratio for death: 0.55 (95% CI, 0.36–0.83) for Nivolumab vs Standard Therapy.

Hazard ratio for death: 0.89 (95% CI, 0.54–1.45) for Nivolumab vs Standard Therapy.
Quality of Life and Symptom Burden

C Quality of Life and Symptom Burden

- Physical Functioning
  - Week 9: Nivolumab: Better, P=0.01; Standard Therapy: Worse, P<0.001
  - Week 15: Nivolumab: Better, P<0.001; Standard Therapy: Worse, P<0.001

- Role Functioning
  - Week 9: Nivolumab: Better, P=0.003; Standard Therapy: Worse, P<0.001
  - Week 15: Nivolumab: Better, P<0.001; Standard Therapy: Worse, P<0.001

- Social Functioning
  - Week 9: Nivolumab: Better, P=0.002; Standard Therapy: Worse, P<0.001
  - Week 15: Nivolumab: Better, P<0.001; Standard Therapy: Worse, P<0.001

- Pain
  - Week 9: Nivolumab: Better, P<0.001; Standard Therapy: Worse, P<0.001
  - Week 15: Nivolumab: Better, P=0.02; Standard Therapy: Worse, P<0.001

- Sensory Problems
  - Week 9: Nivolumab: Better, P=0.01; Standard Therapy: Worse, P<0.001
  - Week 15: Nivolumab: Better, P<0.001; Standard Therapy: Worse, P<0.001

- Social-Contact Problems
  - Week 9: Nivolumab: Better, P=0.26; Standard Therapy: Worse, P<0.001
  - Week 15: Nivolumab: Better, P<0.001; Standard Therapy: Worse, P<0.001
Randomized Trial era: KEYNOTE 040 Phase 3

R/M HNSCC PD-L1 +/- Failure of platinum therapy Nth line

Prim endpoint: OS

Pembro 200 mg IV every 3 weeks

- Methotrexate 40 mg/m² IV weekly
- Docetaxel 30 mg/m² IV weekly
- Cetuximab 400 mg/m² IV once, then 250 mg/m² weekly

Primary endpoint
- OS

Other endpoints
- PFS
- ORR
- Safety
- DOR
- Biomarkers
- Quality of life

Did not meet its primary endpoint of statistically significant superiority of pembro vs standard-still approved
Recurrent/Metastatic Disease

2nd line therapy

- Pembrolizumab/Nivolumab
- Taxane + cetuximab
- Cisplatin + cetuximab
- Methotrexate
Overview - Principles

Localized Disease
Stage I or II
Surgery or Radiation

Locoregionally Advanced
Stage III-IVA
Surgery
Definitive Chemoradiation
Induction Chemotherapy
Definitive Chemoradiation

Metastatic or Recurrent
Palliative Chemotherapy
Salvage Surgery/Radiation.
Treatment of surgically resected head and neck cancer

- After surgery, low, intermediate and high risk factors have been identified as being associated with a greater risk of cancer recurrence and poorer overall survival

- Currently chemotherapy is added to radiation on the basis of pathology findings at surgery
No Further Treatment

T1-2 with:

Margin –

Ø ECE
Ø ALI/PNI
N0 or N1

Radiation Alone

Chemo-Radiation Margin + ECE

Mult + LN (N2b-c)

- PNI
- ALI
- Bulky LN (N2a,3)
- T3-4
- OP/OC → Level 4-5 LN
Disruptive TP53 Mutation Is Associated with Aggressive Disease Characteristics in an Orthotopic Murine Model of Oral Tongue Cancer

Daisuke Sano¹, Tong-Xin Xie¹, Thomas J. Ow¹, Mei Zhao¹, Curtis R. Pickering¹, Ge Zhou¹, Vlad C. Sandulache¹, David A. Wheeler², Richard A. Gibbs², Carlos Caulin¹, and Jeffrey N. Myers¹
Survival time and tumor volume according to TP53 mutation status in the orthotopic nude mouse model of HNSCC. A, survival of the wild-type and mutant TP53 groups.


©2011 by American Association for Cancer Research
Future Directions-EA 3132

Surgically resected HNSCC, no high risk factors on surgical pathology

Cancer Genetic analysis including the presence of disruptive p53 mutations

RANDOMIZE

60 Gy Radiation

Cisplatin 40 mg/m2x6
60 Gy Radiation

Disease Free survival

Co Chairs: Christine Chung and Robert Ferris
Summary

- Head and neck cancer is a diverse collection of diseases with different etiology (smoking/HPV)
- Immune checkpoint inhibitors are prolonging the lives of patients for many months, with a good quality of life
- Study of cancer biology can result in better treatments and eventually lead to prevention of cancer
1. From the day they are diagnosed, patients with metastatic head and neck cancer are most likely to have a median survival of:

   a. <6 months
   b. 10-12 months
   c. 4-5 years
   d. 9-10 years

Reference: Platinum-Based Chemotherapy plus Cetuximab in Head and Neck Cancer. Vermorken, NEJM 2008; 359(11) 1116-27
2. Which of the following drugs has demonstrated a statistically significant overall survival benefit in head and neck cancer patient randomized clinical trials?

a. ipilimumab
b. pembrolizumab
c. nivolumab
d. erlotinib

Questions

3. Immune checkpoint inhibitors cause head and neck squamous cancer to shrink and patients to live longer by which of the following mechanisms?

   a. by forming double stranded DNA-adducts in the nucleus of the cancer cell, leading to apoptosis
   b. by leading to the production of monoclonal antibodies that re-active p53
   c. by T-cell mediated destruction after blocking the Programmed Death receptor (PD-1)
   d. by being internalized into the cell and releasing a toxic payload when entering the lysosome
Questions

4. If the following risk factors are identified on surgical pathology, the patient is at high risk for cancer recurrence and is recommended to be treated with postoperative chemotherapy added to radiation:

- Positive margins and extranodal extension
- Lymphovascular invasion and perineural invasion
- Large number of nodes involved
- The presence of viral markers such as p16, EBV or HPV

ref Postoperative Irradiation with or without Concomitant Chemotherapy for Locally Advanced Head and Neck Cancer bernier et al NEJM 2004
Questions

5. Human papilloma virus is found in >50% of US diagnosed cases of squamous cell cancer arising in the:
   a. lung
   b. larynx
   c. lip
   d. oropharynx

Reference Human Papillomavirus and Rising Oropharyngeal Cancer Incidence in the United States Chaturvedi JCO 2011
## Acknowledgements

**UTSW DOT:**
- Pamela Kurian
- Tam Burks

**ENT**
- Baran Sumer
- John Truelson
- Larry Myers

**Endocrinology**
- Perry Bickel
- Ildi Lingvay
- Alex Tessnow

**Endo surg**
- Shelby Holt
- Alan Dackiw
- Sarah Oltmann

**Mentorship**
- David Gerber
- Jinming Gao
- David Boothman
- Barbara Burtness
- Julie Bauman
- Arthur Frankel
- Jim Willson
- Joan Schiller
- Hak Choy