Educating the cancer care professionals of the 21st century

Solving the shortage of oncology professionals by redesigning cancer care teams

Natasha DLima
Health Workforce Specialist, Corvus Health
Burden of cancer in India

- 100-120 new cancer cases per 100,000 of the population
- 1.45 million estimated new cancer cases in 2016 in India
- 70% of cancer cases present in advanced stage leading to poor survival
- 12.5% of patients come for treatment in early stages of the disease

- Current oncologists to patient ratio is **1:1600** (USA: **1:100**)

Accessibility to cancer care – a challenge

Approximately 210 centres spread across a population of 1.35 billion

*Illustration from Expanding Cancer Care In India – a report by E&Y*
Goal of re-design

- Reduce workload of specialists
- Ensure a larger number of patients are attended to
- Build a more efficient system
- Improve information flow from unilateral to multilateral
- Approach to patient care: from reactive and uniform to preventive and personalized

- Instead of bringing patients to healthcare, take healthcare to the patients
Restructuring the cancer team

- Renewed division of labor and re-training
- Creation of new cadres
- Designing career pathways
# Medical oncology team

<table>
<thead>
<tr>
<th>Old team</th>
<th>New team</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Oncologist</td>
<td>Medical Oncologist</td>
<td>1 month</td>
</tr>
<tr>
<td></td>
<td><strong>Cancer GP</strong></td>
<td></td>
</tr>
<tr>
<td>Oncology Nurse Level 1</td>
<td>Oncology Nurse Level 1</td>
<td>3 month</td>
</tr>
<tr>
<td></td>
<td><strong>Palliative Care Nurse (in some cases)</strong></td>
<td>3 months</td>
</tr>
<tr>
<td>Stoma Care Nurse</td>
<td>Stoma Care Nurse</td>
<td>3 months</td>
</tr>
<tr>
<td>General Nurse</td>
<td>General Nurse</td>
<td>3 months</td>
</tr>
<tr>
<td></td>
<td><strong>ANM (not new, but now included in team)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>GDA (not new, but now included in team)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Phlebotomist</strong></td>
<td>3 months</td>
</tr>
<tr>
<td>Housekeeping Staff</td>
<td>Housekeeping Staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Patient Navigator</strong></td>
<td>1 month</td>
</tr>
<tr>
<td>Ward Boy</td>
<td>Ward Boy</td>
<td>1 month</td>
</tr>
<tr>
<td>Admin Staff</td>
<td>Admin Staff</td>
<td>1 month</td>
</tr>
</tbody>
</table>
## Radiation oncology team

<table>
<thead>
<tr>
<th>Old team</th>
<th>New team</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation Oncologist</td>
<td>Radiation Oncologist</td>
<td>1 month</td>
</tr>
<tr>
<td>Nuclear Medicine Physician</td>
<td>Nuclear Medicine Physician</td>
<td>1 month</td>
</tr>
<tr>
<td><strong>Nuclear Medicine GP</strong></td>
<td></td>
<td>6 months</td>
</tr>
<tr>
<td>Radiation GP</td>
<td></td>
<td>6 months</td>
</tr>
<tr>
<td>Medical Physicist</td>
<td>Medical Physicist</td>
<td>1 month</td>
</tr>
<tr>
<td><strong>Dosimetrist</strong></td>
<td></td>
<td>2 months</td>
</tr>
<tr>
<td>Radiation Therapist</td>
<td>Radiation Therapist</td>
<td>6 months</td>
</tr>
<tr>
<td>RSO (Radiation Safety Officer)</td>
<td>RSO (Radiation Safety Officer)</td>
<td>6 months</td>
</tr>
<tr>
<td>Radiologist</td>
<td>Radiologist</td>
<td>1 month</td>
</tr>
<tr>
<td>Radiation Techs</td>
<td>Radiation Techs</td>
<td>6 months</td>
</tr>
<tr>
<td>Nuclear Medicine Tech/</td>
<td>Nuclear Medicine Tech/ Radiographer</td>
<td>6 months</td>
</tr>
<tr>
<td>Radiographer</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Radiation Nurse</strong></td>
<td></td>
<td>2 months</td>
</tr>
</tbody>
</table>
## Surgical oncology team

<table>
<thead>
<tr>
<th>Old team</th>
<th>New team</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical Oncologist</td>
<td>Surgical Oncologist</td>
<td>1 month</td>
</tr>
<tr>
<td></td>
<td><strong>Surgical Cancer GP</strong></td>
<td>6 months</td>
</tr>
<tr>
<td></td>
<td>(Gen Surg/ENT/ Gynaec/MDS OMFS)</td>
<td></td>
</tr>
<tr>
<td>OT (Operating Theater) Nurse</td>
<td>OT (Operating Theater) Nurse</td>
<td>3 months</td>
</tr>
<tr>
<td>Surgical Technician</td>
<td>Surgical Technician</td>
<td>6 months</td>
</tr>
</tbody>
</table>
## Anaesthesiology team

<table>
<thead>
<tr>
<th>Old team</th>
<th>New team</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesiologist</td>
<td>Anesthesiologist</td>
<td>1 month</td>
</tr>
<tr>
<td><strong>Anaesthesiology GP</strong></td>
<td></td>
<td>6 months</td>
</tr>
<tr>
<td><strong>Anaesthesia Techs</strong></td>
<td></td>
<td>6 months</td>
</tr>
<tr>
<td>Critical Care/ICU Nurses</td>
<td>Critical Care/ICU Nurses</td>
<td>3 months</td>
</tr>
</tbody>
</table>
## Pharmacy team

<table>
<thead>
<tr>
<th>Old team</th>
<th>New team</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacists</td>
<td>Pharmacists <em>(more efficient delegation to pharm techs)</em></td>
<td>3 months</td>
</tr>
<tr>
<td>Pharm Techs</td>
<td>Pharm Techs</td>
<td>2 months</td>
</tr>
<tr>
<td>Stockers</td>
<td>Stockers</td>
<td>Nil (no change in responsibilities)</td>
</tr>
<tr>
<td>Procurement Officers</td>
<td>Procurement Officers</td>
<td>Nil (no change in responsibilities)</td>
</tr>
</tbody>
</table>
## Pathology and laboratory team

<table>
<thead>
<tr>
<th>Old team</th>
<th>New team</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathologist</td>
<td>Pathologist (more efficient delegation to Pathology Technician)</td>
<td>6 months</td>
</tr>
<tr>
<td>Pathology Technician</td>
<td>Pathology Technician</td>
<td>6 months</td>
</tr>
<tr>
<td>Laboratory Technician</td>
<td>Laboratory Technician</td>
<td>6 months</td>
</tr>
</tbody>
</table>
Benefits of redesign

- Increase in the number of patients served
- Improvement and standardization of the quality of care
- Improvement in accessibility and timeliness of care
- Increase in cultural acceptability of care and patient satisfaction
- Decrease in the cost of care
Competency-based training & task shifting

✓ Enabling workers to practice at the top of their license
✓ Enhanced focus on the health workers’ most valuable skills
✓ Improving health worker satisfaction and the desirability of jobs
More efficient teams

- Better communication amongst health workers
- Better communication between health workers and patients and their families
- Innovations in health services delivery
Thank you for your time!

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www.corvushealth.com
Global Educational Curriculum in Surgical Oncology

Chandra Are MD, MBA
JL & CJ Varner Professor Surgical Oncology & Global Health

World Cancer Congress
October 4th, 2018
Kuala Lumpur, Malaysia
OBJECTIVES

- Global cancer burden
- Need for /lack of surgical services
- How to address rising global cancer burden
- Current educational environment for cancer surgeons
- Proposed measures for cancer surgeons
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Global cancer burden

Estimated Number of New Cancer Cases by World Area, 2012*

*Region estimates do not sum to the worldwide estimate due to calculation method.
Source: GLOBOCAN 2012.
Global cancer burden

Global cancer burden (millions)

- 2008:
  - Incidence: 12.7
  - Deaths: 7.6

- 2030:
  - Incidence: 21.4
  - Deaths: 13.2

Legend:
- Incidence
- Deaths
# Global cancer burden

## Table 1. Leading Causes of Death Worldwide by Income Level, 2012 (Thousands)

<table>
<thead>
<tr>
<th></th>
<th>Worldwide</th>
<th>Low- and Middle-income</th>
<th>High-income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rank</td>
<td>Deaths</td>
<td>%</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>1</td>
<td>17,513</td>
<td>31%</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>2</td>
<td>8,204</td>
<td>15%</td>
</tr>
<tr>
<td>Infectious and parasitic diseases</td>
<td>3</td>
<td>6,431</td>
<td>12%</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>4</td>
<td>4,040</td>
<td>7%</td>
</tr>
<tr>
<td>Unintentional injuries</td>
<td>5</td>
<td>3,716</td>
<td>7%</td>
</tr>
<tr>
<td>Respiratory infections</td>
<td>6</td>
<td>3,060</td>
<td>5%</td>
</tr>
<tr>
<td>Digestive diseases</td>
<td>7</td>
<td>2,263</td>
<td>4%</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>8</td>
<td>1,497</td>
<td>3%</td>
</tr>
<tr>
<td>Intentional injuries</td>
<td>9</td>
<td>1,428</td>
<td>3%</td>
</tr>
<tr>
<td>Genitourinary diseases</td>
<td>10</td>
<td>1,195</td>
<td>2%</td>
</tr>
<tr>
<td>Nutritional deficiencies</td>
<td>11</td>
<td>559</td>
<td>1%</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>12</td>
<td>556</td>
<td>1%</td>
</tr>
<tr>
<td>Maternal conditions</td>
<td>13</td>
<td>296</td>
<td>1%</td>
</tr>
<tr>
<td>Musculoskeletal diseases</td>
<td>14</td>
<td>216</td>
<td>0%</td>
</tr>
<tr>
<td>Other neoplasms</td>
<td>15</td>
<td>193</td>
<td>0%</td>
</tr>
</tbody>
</table>

Global cancer burden

Cancer mortality compared to other diseases

30.4m
Total non-communicable diseases (including cancer, cardiovascular disease, respiratory diseases, diabetes)

7.6m
2.5m
Good news: 1 in 3 avoidable deaths with prevention, early detection and treatment

300,000
350,000
340,000
HIV/AIDS 4% mortality rate
Tuberculosis 12%
Malaria 0.3%
Seasonal flu 0.1%
Hepatitis C 9%
Meningitis 4%

1.8m
1.3m
Deaths per year

http://www.worldcancerday.org/node/1155/
Global cancer burden

The global economic cancer burden

Cancer is costly...
The economic cost* of cancer exceeds that of any other disease...

http://www.worldcancerday.org/node/1155/
OBJECTIVES

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Need for/lack of surgical services
Need for/lack of surgical services

Chance of needing an operation (Developed country)

Need for/lack of surgical services

Proportion of admissions requiring surgery by site-specific cancer

Need for/lack of surgical services

Number of surgical procedures per 100,000 population, 2004

Surgery is essential for global cancer care in all resource settings. Of the 15·2 million new cases of cancer in 2015, over 80% of cases will need surgery, some several times. By 2030, we estimate that annually 45 million surgical procedures will be needed worldwide. Yet, less than 25% of patients with cancer worldwide actually get safe, affordable, or timely surgery. This Commission on global cancer surgery, building on Global Surgery 2030, has examined the state of global cancer surgery through an analysis of the burden of surgical disease and breadth of cancer surgery, economics and financing, factors for strengthening surgical systems for cancer with multiple-country studies, the research agenda, and the political factors that frame policy making in this area. We found wide equity and economic gaps in global cancer surgery. Many patients throughout the world do not have access to cancer surgery, and the failure to train more cancer surgeons and strengthen systems could result in as much as US$6·2 trillion in lost cumulative gross domestic product by 2030. Many of the key adjunct treatment modalities for cancer surgery—eg, pathology and imaging—are also inadequate. Our analysis identified substantial issues, but also highlights solutions and innovations. Issues of access, a paucity of investment in public surgical systems, low investment in research, and training and education gaps are remarkably widespread. Solutions include better regulated public systems, international partnerships, super-centralisation of surgical services, novel surgical clinical trials, and new approaches to improve quality and scale up cancer surgical systems through education and training. Our key messages are directed at many global stakeholders, but the central message is that to deliver safe, affordable, and timely cancer surgery to all, surgery must be at the heart of global and national cancer control planning.
### Need for/lack of surgical services

#### Global volume of surgery

<table>
<thead>
<tr>
<th>Variable</th>
<th>Very low</th>
<th></th>
<th>Low</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Member States</td>
<td>47</td>
<td>50</td>
<td>60</td>
<td>54</td>
</tr>
<tr>
<td>Population, in millions (% of global population)</td>
<td>2248 (34.8)</td>
<td>2573 (36.8)</td>
<td>2258 (35.0)</td>
<td>2393 (34.2)</td>
</tr>
<tr>
<td>Mean estimated surgical rate, per 100 000 population per year (95% CI)</td>
<td>394 (273–516)</td>
<td>666 (465–867)</td>
<td>1851 (1162–2540)</td>
<td>3973 (2 320–5625)</td>
</tr>
<tr>
<td>Change in surgical rate, % (95% CI)</td>
<td>–</td>
<td>69.0 (9.9–160.0)</td>
<td>–</td>
<td>114.6 (23.1–274.2)</td>
</tr>
<tr>
<td>Estimated no. of surgeries in millions (95% CI)</td>
<td>14.0 (1.8–26.2)</td>
<td>19.6 (7.4–51.7)</td>
<td>41.4 (5.6–77.3)</td>
<td>72.2 (56.7–91.9)</td>
</tr>
<tr>
<td>% of global volume of surgery (95% CI)</td>
<td>6.2 (1.9–21.5)</td>
<td><strong>6.3 (1.7–22.9)</strong></td>
<td>18.3 (5.5–63.2)</td>
<td>23.1 (14.8–36.7)</td>
</tr>
</tbody>
</table>

### Global volume of surgery

<table>
<thead>
<tr>
<th></th>
<th>Middle</th>
<th></th>
<th>High</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>47</td>
<td>46</td>
<td>38</td>
<td>44</td>
</tr>
<tr>
<td>940 (14.7)</td>
<td>799 (11.4)</td>
<td>1007 (15.6)</td>
<td>1236 (17.7)</td>
<td></td>
</tr>
<tr>
<td>3944 (2857–5030)</td>
<td>4822 (3085–6560)</td>
<td>11 629 (9560–13 697)</td>
<td>11 168 (9151–13 186)</td>
<td></td>
</tr>
<tr>
<td>–</td>
<td>22.3 (–22.2–92.1)</td>
<td>–</td>
<td>– (–4.0 (–25.4–23.6)</td>
<td></td>
</tr>
<tr>
<td>31.9 (19.3–44.5)</td>
<td>34.1 (19.8–58.7)</td>
<td>139.0 (131.5–146.4)</td>
<td>187.0 (155.8–224.5)</td>
<td></td>
</tr>
<tr>
<td>14.1 (7.2–28.5)</td>
<td>10.9 (5.0–24.5)</td>
<td>61.4 (46.5–84.1)</td>
<td>59.8 (41.0–88.8)</td>
<td></td>
</tr>
</tbody>
</table>

Need for/lack of surgical services

- Inadequate work force
- Inadequate facilities
- Inadequate training pathways
- Variations in training pathways
- Not up to standard educational pathways
OBJECTIVES

- Global cancer burden
- Need for /lack of surgical services
- How to address rising global cancer burden
- Current educational environment for cancer surgeons
- Proposed measures for cancer surgeons
How to address rising global cancer burden

1. Education
2. Clinical care
3. Research
How to address rising global cancer burden

1. Education
2. Clinical care
3. Research
OBJECTIVES

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Current educational environment
Current educational environment

Wyld. L
Berman .R
Audisio. R
Are. C
Variations in Training of Surgical Oncologists: Proposal for a Global Curriculum

C. Are, MD, MBA, FRCS, FACS\(^1\), A. Caniglia, BS\(^2\), M. Malik, BS\(^2\), C. Cummings, RN, PhD, CCMEP\(^3\), C. Lecoq, B.Ed, EMIAM\(^4\), R. Berman, MD, FRCS\(^5\), R. Audisio, MD, FRCS\(^6\), and L. Wyld, BMedSci, MBChB (Hons), PhD, FRCS\(^7\)

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Current educational environment
Current educational environment
Current educational environment

Current educational environment

Current educational environment

Current educational environment

Current educational environment

Current educational environment

Conclusions: Multiple

- Training is too long
- Training is too variable
- Training is not available in all regions
- Many travel to other parts of the world
- Training related geographic region
- Training related to socio-economic standing

Extremely variable
OBJECTIVES

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Proposed measures
Global Curriculum in Surgical Oncology

Chandrakanth Are, MD, MBA, FRCS, FACS\(^1\), R. S. Berman, MD, FACS\(^2\), L. Wyld, B. Med. Sci. MB. ChB (hons), PhD, FRCS\(^3\), C. Cummings, RN, PhD, CCMEP\(^4\), C. Lecoq\(^5\), and R. A. Audisio, MD, FRCS\(^6\)

\(^1\)Division of Surgical Oncology, Department of Surgery, University of Nebraska Medical Center, Omaha, NE; \(^2\)Division of Surgical Oncology, Department of Surgery, New York University School of Medicine, New York, NY; \(^3\)Jasmine Centre, Doncaster Royal Infirmary, University of Sheffield, Sheffield, UK; \(^4\)Society of Surgical Oncology, Rosemont, IL; \(^5\)European Society of Surgical Oncology, Brussels, Belgium; \(^6\)St Helens Teaching Hospital, University of Liverpool, St Helens, UK

Proposed measures

- Core domains of general oncology for the surgical oncologist

- Core domains in pre-, peri- and postoperative surgical care for the surgical oncologist

- Essentials of core knowledge domains of surgical oncology for each specific disease site

- Essential training in core competencies that need to be satisfied

### Proposed measures

**TABLE 1** Summary of the global curriculum in surgical oncology

<table>
<thead>
<tr>
<th>Core domains of general oncology for the surgical oncologist</th>
<th>Core domains in pre-, peri- and postoperative surgical care for the surgical oncologist</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge and understanding of the principles of:</strong></td>
<td><strong>Knowledge and understanding of the principles of:</strong></td>
</tr>
<tr>
<td>• Epidemiology of cancer</td>
<td>• Surgical procedures and techniques</td>
</tr>
<tr>
<td>• Screening for cancer</td>
<td>• Various surgical approaches</td>
</tr>
<tr>
<td>• Chemotherapy</td>
<td>• Patient selection</td>
</tr>
<tr>
<td>• Radiation therapy</td>
<td>• Risk stratification prior to surgery</td>
</tr>
<tr>
<td>• Biologic and immunotherapy</td>
<td>• Operative planning based on imaging/staging</td>
</tr>
<tr>
<td>• Chronic pain management</td>
<td>• Obtaining consent for operative procedures</td>
</tr>
<tr>
<td>• Palliative care</td>
<td>• Intraoperative care</td>
</tr>
<tr>
<td>• Medical imaging</td>
<td>• Postoperative care</td>
</tr>
<tr>
<td>• Multidisciplinary care</td>
<td>• Postoperative critical care</td>
</tr>
<tr>
<td>• Diagnostic pathology</td>
<td></td>
</tr>
<tr>
<td>• Surveillance</td>
<td></td>
</tr>
<tr>
<td>• Cancer biology</td>
<td></td>
</tr>
<tr>
<td>• Research</td>
<td></td>
</tr>
<tr>
<td>• Delivering care across all resource settings</td>
<td></td>
</tr>
<tr>
<td>• Hereditary cancer syndromes</td>
<td></td>
</tr>
<tr>
<td><strong>Essentials of core knowledge domains of surgical oncology for each specific disease site</strong></td>
<td><strong>Essential training core competencies</strong></td>
</tr>
<tr>
<td>• Breast</td>
<td>• To attain competency in:</td>
</tr>
<tr>
<td>• Colorectal/neural cancer</td>
<td>• Holistic patient care</td>
</tr>
<tr>
<td>• Esophageal, gastric/GE junction</td>
<td>• Medical knowledge</td>
</tr>
<tr>
<td>• Small intestine</td>
<td>• Professionalism</td>
</tr>
<tr>
<td>• Pancreas</td>
<td>• Inter-professional and communication skills</td>
</tr>
<tr>
<td>• Liver and biliary tract</td>
<td>• Experiential learning</td>
</tr>
<tr>
<td>• Endocrine</td>
<td>• Systems-based practice</td>
</tr>
<tr>
<td>• Gastrointestinal oncology</td>
<td>• Operative skills</td>
</tr>
<tr>
<td>• Sarcoma</td>
<td>• Understanding of the human/compassionate side of medicine</td>
</tr>
<tr>
<td>• Peritoneal surface</td>
<td></td>
</tr>
<tr>
<td>• Thoracic</td>
<td></td>
</tr>
<tr>
<td>• Genitourinary</td>
<td></td>
</tr>
<tr>
<td>• Gynecology</td>
<td></td>
</tr>
<tr>
<td>• Pathology applied to each disease-specific site</td>
<td></td>
</tr>
</tbody>
</table>
Proposed measures

- Not all encompassing
- Modular
- Flexible
- Aspirational and not mandatory
- Variable applicability to different parts of the world
Future

- Implementation
- Interest from several countries
- Collaborations
- Funding
Thank you
ASCO/ESMO Global Curriculum for Medical Oncology

Doug Pyle
Vice President, International Affairs
American Society of Clinical Oncology
Disclosures

I am an employee of the American Society of Clinical Oncology
ASCO: A Global Organization

Meeting Attendance

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Leadership Development

- Global Mentoring
- Leadership Development

Quality

- International Workshops
- Guidelines
- Quality Measurement
- Specialty Training (Global Curriculum)
- City Cancer Challenge

Research

- Global Oncology Research Funding
- Journals
Why a Global Curriculum for Medical Oncology?

In 2002, ASCO and ESMO agreed to develop recommendations for the training of medical oncologists, with two main goals in mind:

1. Help establish more definition and structure around medical oncology, promoting its recognition around the world

2. Help establish a more uniform standard of quality for medical oncology training programs around the world
The Global Curriculum

- The Global Curriculum is a set of recommendations for the training of medical oncologists worldwide.

- The GC was developed by a joint ASCO/ESMO task force and published in the *Journal of Clinical Oncology* and *Annals of Oncology* in 2004.

- Has been updated in 2010 and in 2016.
ESMO / ASCO Recommendations for a Global Curriculum in Medical Oncology

Edition 2016
Global Curriculum

Recommendations for a Global Curriculum in Medical Oncology

The Recommendations for a Global Curriculum in Medical Oncology are a set of common guidelines with a global perspective. The guidelines outline the clinical training required for physicians to qualify as medical oncologists.

Members of the ESMO-ASCO Global Core Curriculum Task Force worked together to outline the curriculum. Their goal was to define standards that will guide the training of medical oncologists worldwide. The goal was also to help
ESMO / ASCO Recommendations for a Global Curriculum in Medical Oncology

Edition 2016

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AMERICAN SOCIETY OF CLINICAL ONCOLOGY
The 2016 edition of the GC builds on the inaugural 2004 edition and the 2010 edition. This third edition has been expanded and updated to include:

- **Stand-alone chapters/section**: immunotherapy; biological therapy; pathology; molecular pathology; laboratory medicine; translational research; genetic counselling.

- **New chapters/(sub)sections**: principles of personalised cancer medicine; molecular imaging; rare cancers; cancer treatment in patients with comorbidities; survivorship.

- **Expanded (sub)chapters**: targeted therapies are integrated into the (sub)chapters of the separate tumour entities wherever suitable.
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ESMO / ASCO GLOBAL CURRICULUM
EDUCATIONAL FRAMEWORK

The chapter/section structure has been revised according to new pedagogical principles. Each topic is divided into four areas: Objectives, Awareness, Knowledge and Skills.

- The 'Objectives' area provides an overview of the scope of education a trainee is expected to master in the topic.
- The 'Awareness' area provides components integral to the topic.
- The 'Knowledge' area provides a listing of concepts necessary to practice.
- The 'Skills' area provides the activities included in practicing oncology in the specific area covered.
4. COMPETENCIES REQUIRED IN THE CURRICULUM
4.2 Basic Principles in the Management and Treatment of Malignant Diseases

### 4.2.5 PRINCIPLES OF PERSONALISED CANCER MEDICINE by Luigi De Petris and Jonas Bergh

| Objectives | • To be able to integrate biomarker analysis of prognostic and therapy predictive factors into the treatment decision process, aiming at personalised medicine (precision medicine) therapy selection based on the individual patient’s marker signatures in the cancer cells and normal cells, respectively
• To understand that proper marker analyses and interpretation are the bases for personalised cancer medicine |
| Awareness | • Recognition that a biomarker should prognosticate and predict response to specific therapies, being an indicator of normal biological processes, pathogenic and pathological processes; the marker must have analytical and clinical validity (verifications and replications in several independent data sets) as well as clinical utility, adding clinical value for management
• Awareness that each marker platform should either be analysed centrally in a certified laboratory or, if analysed locally, it should be validated locally, prior to clinical implementation
• Recognition that, in the absence of a specific prognostic and/or predictive target, but linked to a high tumour biology significance, results from unsupervised high-throughput analyses, validated on independent data sets, may rely on extensive bioinformatics processing of raw data
• Awareness that molecular features may be heterogeneous in different areas of the same tumour lesion and may differ between the primary tumour and the corresponding distant metastases, and between the latter ones, which underlines the need for ‘liquid biopsies’ and functional target imaging
• Recognition that molecular characterisation of a tumour in patients should not only focus on the tumour cells but also involve characterisation of the microenvironment, including the tumour stroma, angiogenesis and tumour–host immune interactions |
### 4. COMPETENCIES REQUIRED IN THE CURRICULUM

#### 4.2 Basic Principles in the Management and Treatment of Malignant Diseases

#### 4.2.5 PRINCIPLES OF PERSONALISED CANCER MEDICINE by Luigi De Petris and Jonas Bergh

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<td>- Understanding of the critical importance of prospective biobanking of</td>
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<td>tumour (frozen and paraffin-embedded material) and corresponding normal</td>
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<td>samples (normal tissue, normal genomic DNA) for research purposes and for</td>
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<td>retrospective analyses in cases of clinical implementation of novel tests,</td>
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<td>and for routine use for some upcoming markers</td>
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<tr>
<td>- Understanding of the proper terminology for high-throughput Omics</td>
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<tr>
<td>technologies (genomics (gene expression and RNA sequencing, exome</td>
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<td>sequencing and whole sequencing), proteomics, transcriptomics,</td>
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<td>epigenomics, metabolomics, lipidomics)</td>
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<td>- Understanding of the general principles of targeted (PCR, FISH, IHC)</td>
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<td>and non-targeted (NGS, mRNA assays) technologies for molecular analysis</td>
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<td>- Familiarity with the definition of diagnostic, prognostic,</td>
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<td>therapy-predictive and surrogate biomarkers, respectively</td>
</tr>
<tr>
<td>- Familiarity with the statistical basis required to interpret the</td>
</tr>
<tr>
<td>performance of a biomarker (sensitivity, specificity, positive- and</td>
</tr>
<tr>
<td>negative-predictive values, accuracy, identification of an optimal</td>
</tr>
<tr>
<td>cut-off value (receiver operating characteristic (ROC) curves), hazard</td>
</tr>
<tr>
<td>ratios (HRs), interaction test for therapy prediction of outcomes)</td>
</tr>
<tr>
<td>- Familiarity with the most common targetable mutations in the different</td>
</tr>
<tr>
<td>cancer forms (eg, epidermal growth factor receptor (EGFR) mutations and</td>
</tr>
<tr>
<td>anaplastic lymphoma kinase (ALK) translocations in non-small-cell lung</td>
</tr>
<tr>
<td>cancer (NSCLC), oestrogen receptor (ER) expression, human epidermal</td>
</tr>
<tr>
<td>growth factor receptor 2 (HER-2) amplification/overexpression in breast</td>
</tr>
<tr>
<td>cancer, other malignancies, gastric cancer etc, B-Raf mutations in</td>
</tr>
<tr>
<td>malignant melanoma, breakpoint cluster region (BCR)-Abelson (Abl)</td>
</tr>
<tr>
<td>translocation in chronic myelogenous leukaemia (CML), EGFR expression,</td>
</tr>
<tr>
<td>K-Ras and B-Raf status in colorectal cancer etc)</td>
</tr>
</tbody>
</table>
### 4. COMPETENCIES REQUIRED IN THE CURRICULUM
#### 4.2 Basic Principles in the Management and Treatment of Malignant Diseases

**4.2.5 PRINCIPLES OF PERSONALISED CANCER MEDICINE** by Luigi De Petris and Jonas Bergh

<table>
<thead>
<tr>
<th>Skills</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>•</td>
<td>Ability to interpret and contextualise in current practice results from biomarker-driven clinical trials and from biomarker-based post hoc analysis of trials and marker results for routine clinical patient care</td>
</tr>
<tr>
<td>•</td>
<td>Ability to implement biomarker-based enrichment strategies in patient selection, including inclusion in so called basket studies (analyses of multiple-drug targets at the same time and offering the patient a specific study, based on the results) for clinical trials and to use for routine clinical care</td>
</tr>
<tr>
<td>•</td>
<td>Ability to discuss with patients the possibilities and limitations of a personalised approach based on current understanding and available technologies</td>
</tr>
</tbody>
</table>
## ESMO / ASCO GLOBAL CURRICULUM
### ENDORSEMENTS FROM SOCIETIES

<table>
<thead>
<tr>
<th>Country</th>
<th>Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>Shoqata Mediko-Onkologjike Shqiptare (Albanian Oncology Association)</td>
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<tr>
<td>Bosnia and Herzegovina</td>
<td>Udruženje Onkologa BiH (Bosnian Oncology Society)</td>
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<tr>
<td>Armenia</td>
<td>Արյունաբանության և Ուռուցքաբանության Հայկական Ասոցիացիա (AAHO)</td>
</tr>
<tr>
<td>Brazil</td>
<td>Sociedade Brasileira de Oncologia Clínica (SBOC) (Brazilian Society of Clinical Oncology)</td>
</tr>
<tr>
<td>Austria</td>
<td>Österreichische Gesellschaft für Hämatologie und Medizinische Onkologie (OeGHO)</td>
</tr>
<tr>
<td>China</td>
<td>中国临床肿瘤学会 (Chinese Society of Clinical Oncology) (CSCO)</td>
</tr>
<tr>
<td>Belarus</td>
<td>Общественное Объединение «Белорусское Общество Онкологов» (OO BOO)</td>
</tr>
<tr>
<td>Croatia</td>
<td>Hrvatsko društvo za internističku onkologiju (HDIO) (Croatian Society of Medical Oncology)</td>
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<tr>
<td>Belgium</td>
<td>Belgian Society of Medical Oncology (BSMO)</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Ογκολογική Εταιρεία Κύπρου (OEK) (Cyprus Oncology Society)</td>
</tr>
<tr>
<td>Country</td>
<td>Society Name</td>
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<td>---------------------------------------------------------------------</td>
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<tr>
<td>Czech Republic</td>
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<td>Denmark</td>
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<td>Danish Society for Clinical Oncology</td>
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<tr>
<td>Egypt</td>
<td>جمعية المصري لأمراض السرط</td>
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<td>Greece</td>
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<td>جمعية المصري لأمراض السرط</td>
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<td>Estonia</td>
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<td>Hungary</td>
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<td>France</td>
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<td>National Board of Oncology Teachers</td>
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<td>France</td>
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<tr>
<td>France</td>
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<td>French Society of Medical Oncology</td>
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<td>Félag íslenska krabbameinslaekna (FÍK)</td>
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<td>Ireland</td>
<td>Irish Society of Medical Oncology (ISMO)</td>
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<td>Lithuania</td>
<td>Lietuvos chemoterapeutų draugija (LCD)</td>
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<tr>
<td></td>
<td>Lithuanian Society for Medical Oncology (LiSMO)</td>
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<tr>
<td>Israel</td>
<td>האיגוד הישראלי לאונקולוגיה קלינית ורדיותרפיה, ישראל The Israel Society of Clinical Oncology &amp; Radiation Therapy (ISCORT)</td>
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<tr>
<td>Luxembourg</td>
<td>Société Luxembourgeoise d’Oncologie (SLO)</td>
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<td></td>
<td>Luxembourg Society of Oncology</td>
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<tr>
<td>Italy</td>
<td>Associazione Italiana di Oncologia Medica (AIOM) Italian Association of Medical Oncology</td>
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<tr>
<td>Mexico</td>
<td>Sociedad Mexicana de Oncologia A.C. (SMeO)</td>
</tr>
<tr>
<td></td>
<td>Mexican Society of Clinical Oncology</td>
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<td>Japan</td>
<td>Nihon Rinshoushuyou Gakkai (日本臨床腫瘍学会) Japanese Society of Medical Oncology (JSMO)</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Myanmar Oncology Society (MOS)</td>
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<tr>
<td>Republic of Korea</td>
<td>Korean Association for Clinical Oncology (KACO)</td>
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<td>Philippines (the)</td>
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<tr>
<td>Latvia</td>
<td>Latvijas onkologu kīmijterapeitu asociācija (LOKA) Latvian Association of Medical Oncologists</td>
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<tr>
<td>Poland</td>
<td>Polskie Towarzystwo Onkologii Klinicznej (PTOK) Polish Society of Clinical Oncology</td>
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<td>Lebanon</td>
<td>الجامعة اللبنانية لطب التومور الخبيث Lebanese Society of Medical Oncology (LSMO)</td>
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<tr>
<td>Country</td>
<td>Endorsements</td>
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<tr>
<td>------------------</td>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td>Romania</td>
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<td>Russian Federation</td>
<td>Российское общество клинической онкологии (RUSSCO)</td>
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<td>Serbia</td>
<td>Udruženje medikalnih onkologa Srbije (UMOS)</td>
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<td>Slovenian Republic</td>
<td>Slovenská onkologická spoločnosť (SOS)</td>
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<td>Slovenia</td>
<td>Sekcija za internistično onkologijo pri Slovenskem zdravniškem društvu</td>
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<td>Spain</td>
<td>Sociedad Española de Oncología Médica (SEOM)</td>
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<td>Spain</td>
<td>Spanish Society of Medical Oncology</td>
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<td>Switzerland</td>
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<tr>
<td>Ukraine</td>
<td>Асоціація онкогематологів України</td>
</tr>
</tbody>
</table>
Some Challenges

- Maintaining the curriculum at the pace of scientific change
- Curriculum becoming more sophisticated – need to revisit a “core” curriculum for resource-limited settings?
- How to handle training for other physician groups who are providing systemic therapy
- This is an outline. Are there opportunities to provide training content?
- What is the uptake and impact of the ASCO ESMO curriculum?
Uptake Assessment: ESMO ASCO Survey

- ESMO and ASCO are conducting a global survey on:
  - Status of Medical Oncology recognition as a specialty or sub-specialty
  - Training requirements for medical oncologists
  - Training institutions and capacity
  - Curriculum authorities
  - Adoption of the Global Curriculum
  - Estimated national workforce size for prescribing systemic anti-tumor therapy
  - Among other topics

- Will be an important baseline data for ASCO ESMO efforts going forward
ASCO Medical Oncology In-Training Exam (ITE)

- First administered in 2008
- 6-hour, 200 question examination
  - Case-based, multiple choice, one correct answer
  - Internet-based
  - Trainees participate at home institution
  - Formal, proctored environment
- Assesses medical oncology knowledge
- Not a certifying exam
- Intended for self-evaluation & program improvement
ASCO Medical Oncology In-Training Exam (ITE)

- Measures fund of knowledge objectively, compliant w/ACGME
- Helps establish consistency in educational standards
- Serves as benchmark and tool to improve training
- Identifies areas of strengths and weaknesses
- For fellows:
  - Allows evaluation of progress within training program and compares results against national outcomes
  - Provides insight into ABIM certification exam
### 2018 Participation Statistics

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Programs</td>
<td>196</td>
</tr>
<tr>
<td>Total Trainees</td>
<td>1865</td>
</tr>
<tr>
<td>Total Program Directors &amp; Faculty</td>
<td>34</td>
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<tr>
<td><strong>GRAND TOTAL PARTICIPATION</strong></td>
<td><strong>1899</strong></td>
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<tr>
<td>USA Programs</td>
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<td>USA Trainees</td>
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<tr>
<td>International Programs</td>
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<tr>
<td>International Trainees</td>
<td>291</td>
</tr>
</tbody>
</table>
Aggregated Test Score Comparisons, 2017 Data

U.S. and Canada

Other International Programs
2019 In-Training Exam

- Save the Dates! **February 26 & 27**
- Exam Registration opens November 2018
- More information check asco.org and myConnection
The ESMO examination is a valuable assessment tool for practising medical oncologists and an excellent opportunity for medical oncologists in training to assess their knowledge.

The ESMO Examination is the written part of the Board Certification in Medical Oncology in Switzerland and Slovenia.

In all other countries the ESMO Examination certifies an excellent knowledge in the field of Medical Oncology according to the criteria of the European Society for Medical Oncology.
2018 ESMO EXAMINATION
LOCAL SESSIONS

On 20th October 2018 the ESMO Examination will take place in 6 parallel sessions:

- Munich, Germany (main session)
- Baghdad, Iraq (NEW local session)
- Berlin, Germany
- Chennai, India
- Cairo, Egypt
- Olten, Switzerland
ASCO University Essentials

- Over 100 eLearning courses
  - Immuno-Oncology
  - Cancer Genetics
  - Tumor Genomics
  - Clinical Research
- Tumor Boards
- Self-Evaluation Tools
  - Personalized Learning Dashboard
  - MOC App
  - Comprehensive Oncology Assessment

University.ASCO.org

Weekly Podcasts
Training Program Support: Virtual Faculty Pilot

- Webex-based video lectures delivered remotely by ASCO ESMO volunteer faculty on Global Curriculum topics
- Lectures held to date (pilot with Moi University and University of Nairobi):
  - Lung
  - Colorectal
  - Palliative Care
- Some similarities with European School of Oncology video lectures
- Feedback that ASCO and ESMO should continue efforts.
Questions?