Lesson 3: Overview of Modern Cancer Care – surgery, chemo, radiotherapy, targeted, immunotherapy

1. Why This Lesson Matters

In an integrative oncology practice, you will constantly read words like “neoadjuvant chemo”, “adjuvant RT”, “CCRT”, “palliative line”, “targeted therapy”, “immunotherapy”.
If these terms are not crystal clear, it becomes impossible to:

- Understand oncology reports and discharge summaries
- Time your Ayurvedic support correctly
- Communicate sensibly with the treating oncologist

This lesson gives you a clear, clinically useful overview of **how modern cancer is treated**, what each modality does, and where Ayurveda can logically fit in.

2. Treatment Intent – What Are We Trying to Achieve?

Before choosing any treatment, oncologists first decide the **intent** of treatment. This determines how aggressive they will be and how they weigh benefits vs side-effects.

2.1 Curative Intent

Goal:

- To **eliminate all detectable cancer** and give long-term disease-free survival.
- The expectation is that, if all goes well, the patient may live a normal or near-normal lifespan.

Examples:

- Early-stage breast cancer: surgery + adjuvant therapy.
- Early-stage colon cancer: surgical resection followed by chemo in some cases.
- Some lymphomas and testicular cancers with chemotherapy ± RT.

Features:

- Aggressive treatment may be used because the potential reward is cure.
- Short-term side-effects may be accepted if long-term survival is likely.

2.2 Adjuvant Therapy

Definition:

- Treatment given **after the primary treatment** (usually surgery) to destroy microscopic disease and reduce the risk of recurrence.

Example:

- A woman undergoes surgery for breast carcinoma. The tumor and nodes are removed. Then she receives adjuvant chemotherapy and/or radiotherapy and/or hormonal therapy.

Key point:

- Adjuvant therapy is not primarily to shrink visible tumor; it is to eliminate possible **micrometastases** (cancer cells too small to be seen on scans) and prevent relapse.

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2.3 Neoadjuvant Therapy

Definition:

- Treatment given **before the primary local treatment** (surgery or RT) to shrink the tumor, make it operable, or preserve organs.

Examples:

- Locally advanced breast CA: neoadjuvant chemo to shrink tumor so that breast-conserving surgery becomes possible.
- Rectal carcinoma: neoadjuvant chemoradiation to shrink tumor and improve chances of complete resection.

Key point:

- Neoadjuvant treatment helps “downstage” the disease and sometimes allows less mutilating surgery.

2.4 Palliative Intent

Definition:

- Treatment aimed at **relief of symptoms**, improvement of quality of life, and sometimes extension of life, when cure is not realistic.

Examples:

- Bone metastasis: palliative RT for pain relief.
- Metastatic lung cancer: palliative chemotherapy or targeted therapy.
- Advanced head and neck cancer: palliative surgery/RT to control bleeding or obstruction.

Key understanding for an integrative Ayurvedic physician:

- Palliative care is not “doing nothing”.
- It is active, focused medical care with the **primary goal of comfort and dignity**.
- This is an area where well-planned, safe Ayurvedic support can play a very strong complementary role.

3. Factors That Decide Treatment Strategy

Oncologists do not choose a therapy randomly. They consider multiple factors:

3.1 Tumor-related Factors

- **Type of cancer**
  - Carcinoma, sarcoma, leukemia, lymphoma, etc.
- **Primary site**
  - Breast, lung, cervical, colon, etc.
- **Stage of disease**
  - TNM system (Tumor size, Node involvement, Metastasis).
  - Early stage vs locally advanced vs metastatic.
- **Tumor biology**
  - Hormone receptor status (ER/PR in breast cancer).
  - HER2 status in breast/gastric cancers.
  - EGFR/ALK/ROS1, etc. mutations in lung cancer.
  - Grade (low-grade vs high-grade).

3.2 Patient-related Factors

- Age

- Performance status (PS): how fit and active the patient is.
  - ECOG scale (0–4) or Karnofsky Performance Status (KPS).
  - Poor PS may limit aggressive treatment options.
- Comorbidities
  - Diabetes, hypertension, CKD, liver disease, heart failure, COPD, etc.
- Organ function
  - Renal function, liver function, bone marrow reserve.
- Social and psychological context
  - Family support, distance from treatment center, financial issues, beliefs and preferences.

3.3 Treatment-related Factors

- Availability of surgical facility, radiotherapy machines, chemo drugs, targeted agents.
- Evidence from clinical trials and guidelines.
- Benefit vs toxicity profile.
- Patient's consent and understanding.

Ayurvedic integrative care must **respect these factors**. Your plan should not contradict or undermine evidence-based oncologic decisions.

4. Major Treatment Modalities

4.1 Surgery

Surgery is one of the oldest and most important cancer treatments.

Roles of surgery:

1. **Diagnostic**
   - Biopsy or removal of a suspicious lesion to establish histopathology.
2. **Staging**
   - Assess how far the disease has spread (e.g. lymph node dissection).
3. **Curative resection**
   - Remove the entire tumor with a margin of normal tissue and regional lymph nodes (oncologic surgery).
4. **Debulking**
   - Remove as much tumor as possible when complete removal is not feasible.
   - Helps symptoms and can improve the effectiveness of chemo/RT.
5. **Palliative surgery**
   - To relieve obstruction (e.g. colostomy for obstructing rectal cancer).
   - To control bleeding or infection.

Common abbreviations you may see:

- **MRM** – Modified Radical Mastectomy
- **BCT** – Breast Conservation Therapy
- **TURBT** – Transurethral Resection of Bladder Tumor
- **R0 Resection** – No microscopic tumor at margin
- **R1/R2** – Microscopic/macroscopic residual tumor

Potential complications:

- Wound infection, bleeding, lymphedema (e.g. arm swelling after axillary dissection), anesthesia risks.

Ayurveda's supportive role around surgery:

- Pre-operative: gentle agni-balancing, minimizing constipation, anxiety.
- Post-operative: supporting wound healing, digestion, bowel function, sleep.

- Long term: lymphedema care, pain management, scar care, general rasayana support.

All this must be done **without interfering** with surgical sterility, antibiotics, or wound care protocols.

4.2 Radiotherapy (RT)

Radiotherapy uses **high-energy radiation** (X-rays, gamma rays, electrons) to damage DNA of cells, leading to cancer cell death.

Roles:

- **Radical/Curative RT** – as main treatment (e.g. some head and neck cancers, cervical cancer).
- **Adjuvant RT** – after surgery to reduce local recurrence.
- **Palliative RT** – to relieve pain, bleeding, obstruction, or neurological symptoms.

Terms you will see:

- **EBRT** – External Beam Radiotherapy (most common).
- **IMRT** – Intensity Modulated Radiotherapy.
- **IGRT** – Image Guided Radiotherapy.
- **Brachytherapy** – placing radioactive source inside/near tumor (e.g. intracavitary in cervical cancer).
- **CCRT** – Concurrent Chemoradiotherapy (chemo + RT together to enhance effect).

Common side-effects (site-specific):

- Skin reaction (erythema, hyperpigmentation, ulceration).
- Mucositis in oral and throat cancers (painful ulcers, difficulty eating).
- Xerostomia (dry mouth) due to salivary gland damage.
- Esophagitis, enteritis, proctitis depending on field.
- Radiation pneumonitis (lung), cystitis (bladder), etc.
- Fatigue.

Ayurvedic support potential:

- Gentle mouth care (kavala/gandusha with safe preparations), mucositis soothing, taste improvement (later modules).
- Skin care with appropriate lepa/ointments (only when oncologist approves, not during active RT field without permission).
- Energy support, appetite, bowel regulation.

Key rule: never apply oily substances directly on RT field during active treatment without explicit instructions, as they may interfere with dosimetry or cause skin issues.

4.3 Chemotherapy

Chemotherapy (CT) uses **cytotoxic drugs** that target rapidly dividing cells.

Uses:

- Curative in some leukemias, lymphomas, germ cell tumors.
- Adjuvant/neoadjuvant in many solid tumors.
- Palliative in metastatic disease.

Mechanism:

- Many chemo drugs interfere with DNA synthesis, replication, or mitosis.
- They work best on **rapidly dividing** cells (both cancer and some normal cells).

Common routes:

- Intravenous (IV), oral, intrathecal (direct into CSF), intraperitoneal.

Common side-effects:

- **Myelosuppression** – decreased blood cell production:
  - Anemia (fatigue, pallor)
  - Leukopenia/neutropenia (infection risk)
  - Thrombocytopenia (bleeding risk)
- Nausea, vomiting
- Hair loss (alopecia)
- Mucositis, diarrhea or constipation
- Organ-specific toxicities:
  - Cardiotoxicity (some drugs)
  - Nephrotoxicity
  - Hepatotoxicity
  - Peripheral neuropathy

Ayurvedic integrative support:

- Managing nausea, appetite, bowel habits.
- Supporting liver, kidney function within safe limits.
- Rasayana for recovery between cycles.
- Mental support, sleep, anxiety.
- Gentle, non-suppressive formulations that do not interfere with drug metabolism (to be detailed later cancer-wise and drug-wise as far as evidence permits).

4.4 Hormonal (Endocrine) Therapy

Some cancers are **hormone-dependent**: their growth is driven by hormones.

Common examples:

- Breast cancer (estrogen receptor ER and progesterone receptor PR positive).
- Prostate cancer (androgen-driven).
- Some endometrial cancers.

Mechanisms:

- Blocking hormone receptors (e.g. tamoxifen).
- Reducing hormone production (e.g. aromatase inhibitors, GnRH analogues).
- Androgen deprivation therapy (ADT) in prostate cancer.

Side-effects:

- Hot flashes, mood changes.
- Weight gain, metabolic changes.
- Osteoporosis, joint pains.
- Sexual dysfunction.

Ayurvedic support:

- Managing menopausal-like symptoms, joint pains, mood issues.
- Bone health support (dietary and herbal).
- Weight and metabolic support guided by agni and doṣa.

4.5 Targeted Therapy

Targeted therapies act on specific **molecules or pathways** important for cancer cell growth and survival.

Examples (just to be aware):

- HER2-targeted drugs in breast and gastric cancer.
- EGFR/ALK/ROS1 inhibitors in lung cancer.
- VEGF inhibitors that block angiogenesis.

Features:

- More specific to tumor pathways than classical chemo.
- Often oral or IV, long-term.

Side-effects:

- Skin rashes, diarrhea, hypertension, hand-foot syndrome.
- Some organ-specific toxicities.

Ayurvedic angle:

- Supportive symptom management (e.g. skin issues, GI disturbances, fatigue).
- Need careful monitoring for interactions (many targeted agents metabolised by liver enzymes).

4.6 Immunotherapy

Immunotherapy uses the patient's own immune system to attack cancer.

Main type in solid tumors now: **immune checkpoint inhibitors**.

- They block certain proteins (checkpoints) that normally restrain immune responses.
- Removing these brakes allows T cells to attack cancer cells more effectively.

Benefits:

- In some patients, can cause deep, long-lasting remissions even in advanced disease.

Challenges:

- Only a subset of patients respond.
- Can cause **immune-related adverse events**:
    - Colitis (diarrhea, bleeding)
    - Hepatitis (liver inflammation)
    - Pneumonitis (lung inflammation)
    - Thyroiditis and other endocrine issues

Ayurvedic clinician must:

- Recognize signs of immune-related toxicity early.
- Never suppress necessary investigations or steroid therapy when oncologist suspects such toxicities.
- Use supportive Ayurveda only under close monitoring.

4.7 Bone Marrow / Stem Cell Transplant

Mainly used in:

- Leukemias
- Lymphomas
- Multiple myeloma
- Some other hematologic disorders

Procedure concept:

- High-dose chemo ± RT destroys diseased bone marrow.
- Healthy stem cells are given back (autologous or allogeneic).
- New marrow reconstitutes blood and immune system.

Risks:

- Severe infections.
- Graft-versus-host disease (GVHD) in allogeneic transplants.
- Long-term immunosuppression.

Ayurvedic support:

- Extremely cautious, always secondary to transplant team decisions.
- Focus on gentle nutrition, micro-ama reduction, psychological support, later-stage rasayana when transplant physicians allow.

4.8 Supportive and Palliative Care

Supportive care is not a “bonus”; it is **central** in oncology.

Includes:

- Pain management (analgesics, opioids as needed).
- Anti-emetics, laxatives, nutritional support.
- Blood products, growth factors (G-CSF).
- Management of infections.
- Physiotherapy, occupational therapy.
- Psychological and spiritual support.
- End-of-life care when appropriate.

This is the zone where **Ayurvedic chikitsa** can often integrate most naturally:

- Pain and symptom relief (without interfering or replacing necessary opioids).
- Bowel management, appetite, sleep, anxiety.
- Rasayana for strength and comfort.
- Sadvritta and Aachara Rasayana for mental peace and acceptance.
- Support to caregivers.

5. Multidisciplinary Team (MDT) Approach

Modern oncology is **team-based**. A typical MDT includes:

- Surgical oncologist
- Medical oncologist
- Radiation oncologist
- Pathologist
- Radiologist
- Palliative care specialist
- Oncology nurses
- Nutritionist/dietician
- Psychologist/psychiatrist
- Sometimes physiotherapist, social worker, and integrative medicine specialist

They may meet in a **tumor board**:

- All relevant specialists discuss each case.
- Review imaging, pathology, staging, patient’s condition.
- Decide the best evidence-based plan together.

For you as an Ayurvedic/integrative clinician:

- Ideal scenario: you are recognized as part of this extended team or at least you are in communication with them.
- Always respect oncology plan as the **backbone** of treatment.
- Document clearly what Ayurvedic support you are adding and why.
- Avoid making contradictory statements like “stop chemo, I will treat you only with Ayurveda”.

6. Where Ayurveda Fits Across the Timeline

Think of a typical cancer journey:

1. **Suspicion and Diagnosis Phase**
    - Your role:
        - Recognize red flags.
        - Encourage timely investigations (not delay with “we’ll try herbs first”).
        - Provide emotional support, diet guidance (light, easy to digest, sattvika foods).
2. **Curative Treatment Phase (Surgery / Chemo / RT)**
    - Focus on:
        - Agni and digestion support.
        - Managing nausea, bowel issues, mucositis, fatigue.
        - Supporting organ function (liver, kidney).
        - Sleep, anxiety, pain.
3. **Immediate Post-treatment and Rehabilitation Phase**
    - Focus on:
        - Rasayana and tissue repair.
        - Gradual nutritional build-up.
        - Gentle exercise, yoga, breathwork.
        - Address sexual health, body image and psychological issues where appropriate.
4. **Long-term Survivorship**
    - Focus on:
        - Lifestyle modification to reduce recurrence risk.
        - Metabolic health, weight control.
        - Managing chronic side-effects (neuropathy, fatigue, menopausal symptoms).
        - Regular follow-ups, early detection of recurrence.
5. **Advanced Disease / Palliative Care**
    - Focus on:
        - Symptom control (pain, breathlessness, ascites discomfort, insomnia, anxiety, depression).
        - Comfort, dignity, spiritual counseling.
        - Support to caregivers and family members.

You will learn detailed, disease-wise and symptom-wise Ayurvedic plans later. This lesson simply shapes your mental map so that all such plans are appropriately timed and justified.

7. Key Take-Home Points

1. Cancer treatment has different **intents** – curative, adjuvant, neoadjuvant, palliative.
2. Choice of treatment depends on **tumor factors, patient factors, and treatment factors**.
3. Major modalities: **surgery, radiotherapy, chemotherapy, hormonal therapy, targeted therapy, immunotherapy, transplant, and supportive/palliative care**.
4. Each modality has characteristic **roles, methods and side-effects**.
5. Oncology is a **multidisciplinary team effort**; an Ayurvedic clinician must learn to work alongside, not against, this team.
6. Ayurveda’s contribution is mainly in:
    - Supporting agni, ojas, organ function.
    - Managing side-effects and symptoms.
    - Improving quality of life and psychological resilience.

    - Helping in rehabilitation and survivorship, and in palliative phases.
7. Integrative care must always be **ethical, transparent, evidence-informed, and non-obstructive** to curative modern treatments.

8. Review Questions

1. Define curative, adjuvant, neoadjuvant, and palliative intent in cancer treatment, with one example of each.
2. List at least five tumor-related and patient-related factors that influence treatment selection.
3. What are the main roles of surgery in cancer care? Mention at least four.
4. Explain the difference between radical radiotherapy and palliative radiotherapy.
5. List common side-effects of chemotherapy that are relevant to Ayurvedic support planning.
6. In which cancers is hormonal therapy commonly used, and what are its typical side-effects?
7. What is targeted therapy and how is it different from conventional chemotherapy?
8. What is immunotherapy and what are “immune-related adverse events”?
9. Describe the composition and purpose of a multidisciplinary tumor board.
10. At which phases of the cancer journey can Ayurveda play a supportive role, and what are the main aims in each phase?

End of Lesson 3