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Amrit is a healthy 28 year old female who has presented to your office with concern regarding a lump that she has felt in her left breast. She is otherwise asymptomatic. How would you proceed?

1 Given a well woman with concerns about breast disease, during a clinical encounter (annual or not):

a) Identify high-risk patients by assessing modifiable and non- modifiable risk factors

A key part of this clinical encounter is the history and physical examination in order to risk stratify this patient.

On history, it is important to further classify the lump. Questions to ask include:

- What has been the course and progression of the mass over time?
- Has there been any fluctuations in the mass with the menstrual cycle?
- Is there any associated pain?
- Have there been any associated overlying skin changes or nipple inversion?
- Has there been any discharge from the nipple?
- Has there been any recent trauma to the breast?

It is also important to ask key questions surrounding the patient's risk profile for breast cancer.

- Female and >40
- Personal history of breast cancer
- Family history of breast or ovarian cancer
- Personal or family history of BRCA1 or 2
- Factors that would increase endogenous estrogen or length of estrogen exposure such as early menarche before 12yo, nulliparity, late menopause after 55yo, or hormone replacement therapy for >5yrs
- Radiation exposure
- EtOH
- Smoking
- Obesity in post-menopausal women

b) Advise regarding screening (mammography, breast self- examination) and its limitations.

The most recent guidelines from the Canadian Task Force on Preventive Health Care published in 2018 offers a framework for screening recommendations for women aged 40-74 who are NOT at an increased risk of breast cancer.

It is important to note that this guideline does not apply to women at an increased risk of breast cancer including women with:

- a personal or family history of breast cancer,
- women who are carriers of or have a first-degree relative with a gene mutation such as BRCA1 and BRCA2, and
- women who had chest radiation therapy prior to the age of 30 or within the past 8 years.

An important update to the 2018 guidelines is the emphasis on shared decision-making between the provider and the patient in regards to screening. Thus, it is important to note that although these recommendations are in place, it is important to discuss the possible benefits and harms from screening in order to allow the woman to make an informed decision about what holds greater value for her.

In general, the guidelines recommend the following:

- In asymptomatic women aged 40-49, the recommendation is NOT to screen with mammography.
- In asymptomatic women aged 50-74, the recommendation is for a screening mammogram to be done every 2-3 years.
- Evidence by the Canadian Task Force indicates that screening mammography results in a modest reduction in breast cancer mortality in women 40-74 years of age with the absolute benefits lower for women younger than 50 years of age.

The Canadian Task Force recommends against breast self-examination as there is low-certainty evidence that this has no impact whatsoever on breast cancer mortality.

c) Advise concerning the woman's role in preventing or detecting breast disease (breast self-examination, lifestyle changes).

As we just mentioned, the Canadian Task Force does NOT recommend breast self-examination in average-risk women. Studies have consistently shown that breast self-examinations do not show any benefit in regards to breast cancer mortality and rather increase anxiety and lead to a higher rate of intervention with breast biopsy revealing benign disease.

Given the lifestyle factors discussed that increase the risk of breast cancer, lifestyle changes that can be discussed with women include reducing alcohol use, smoking cessation, increasing physical activity, and optimizing weight loss.

2 Given a woman presenting with a breast lump:
a) Use the history, features of the lump, and the patient's age to determine if aggressive work-up or watchful waiting is indicated.
b) Ensure adequate support throughout investigation of the breast lump by availability of a contact resource.
c) Use diagnostic tools (e.g., needle aspiration, imaging, core biopsy , referral) in an appropriate manner (i.e., avoid over- or under-investigation, misuse) for managing the breast lump.

Risk stratification is reliant both on the history, as we discussed above, and the physical examination.

- Concerning skin changes would be erythema, dimpling, or thickening of the skin that would suggest peau d-orange, an aggressive form of inflammatory breast cancer. Nipple discharge is another characteristic to watch out for although most times it can be benign - but don't ignore it
- Inspect and palpate both breasts using a vertical grid pattern with varying depths of pressure - this should take at least 3 minutes in total
- Although it is variable, worrisome features for a malignant mass on palpation include a hard, matted lesion with irregular borders. In young women <30 years of age, a firm, rubbery, well-circumscribed, mobile mass that fluctuates with the menstrual cycle is typically a fibroadenoma - a benign non-proliferative lesion
- On examination of the axilla, any evidence of axillary lymphadenopathy or unilateral edema of the arms is concerning for malignancy

Regardless of the features, any palpable dominant breast mass in a man or woman requires further investigation.

b) Ensure adequate support throughout investigation of the breast lump by availability of a contact resource.

Discovering a breast lump and going through the process of further investigation is anxiety-provoking for patients. The supports available vary across provinces and territories in Canada. Typically, the Cancer Agency within each province tends to link patients up with various

psychosocial supports and resources. We recommend looking into and becoming familiar with the province- and territory-specific resources available in your health region! Aside from that, reiterating your support for the patient and checking in with them regarding mental health is really key.

c) Use diagnostic tools (e.g., needle aspiration, imaging, core biopsy , referral) in an appropriate manner (i.e., avoid over- or under-investigation, misuse) for managing the breast lump.

Back to our patient Amrit. Upon history, she has none of the specific risk factors for breast cancer discussed above. On examination, you don't notice any overlying skin changes or nipple changes. You palpate a 2 cm non-tender firm but mobile mass in the upper outer quadrant of the left breast. What, if any, investigations would you order?

For symptomatic patients <30 years of age, the initial recommended investigation is diagnostic ultrasound. Note that the radiologist typically classifies the study using the BIRADS classification in order to make recommendations regarding further investigations. The BIRADS classification is as follows:

- BIRADS 0: Incomplete study
- BIRADS 1: Normal study
- BIRADS 2: Benign
- BIRADS 3: Probably benign (ie. >98% likelihood of being benign)
- BIRADS 4: Suspicious abnormality
    - 4A: 2-10% likelihood of malignancy
    - 4B: 10-50% likelihood of malignancy
    - 4C: 50-95% likelihood of malignancy
- BIRADS 5: Highly suggestive of malignancy (>95%)
- BIRADS 6: Known biopsy-proven malignancy

Typically, an ultrasound guided core biopsy is done during the procedure IF indicated and feasible. The patient may subsequently proceed to a diagnostic mammogram if indicated.

For symptomatic patients >30 years of age, the initial recommended investigation is diagnostic mammography and ultrasound.

Note that if the lesion cannot be visualized on ultrasound and thus it is not feasible to do an ultrasound-guided biopsy, a stereotactic core biopsy can be done using mammography. If mass is far to deep within the breast tissue, then fine wire localization and excision can be done for pathologic classification.

3 In a woman who presents with a malignant breast lump and knows the diagnosis:
https://www.albertahealthservices.ca/assets/info/hp/cancer/if-hp-cancer-guide-br013-early-stage-follow-up.pdf

a) Recognize and manage immediate and long-term complications of breast cancer.
b) Consider and diagnose metastatic disease in the follow-up care of a breast cancer patient by appropriate history and investigation.c) Appropriately direct (provide a link to) the patient to community resources able to provide adequate support (psychosocial support).

Immediate Complications of Confirmed Breast Cancer

Many of these will relate to the treatments that they have already received, or that they are still on. So let's go through each of these:

1. **Hormone, or Endocrine Therapy**
    a. If they're taking Tamoxifen, complications to watch for are:
        i. Increased risk of DVT, stroke and cataracts
        ii. More commonly: hot flashes, and vaginal discharge
        iii. Monitor for endometrial cancer. Pts with abnormal vaginal bleeding need workup and likely referral to gynecology

    b. If they're taking Aromatase Inhibitors
    Some examples are: anastrozole, letrozole
        i. There is increased risk of: arthralgia, myalgia, dyspareunia, vulvovaginal atrophy, hot flashes
        ii. Also increased risk for osteopaenia/osteoporosis
            1. As such, should have baseline DEXA scan done and follow-up DEXA scans per the Osteoporosis guidelines
            2. Encourage usual bone health measures:
                a. Weight bearing exercises regularly
                b. Stop smoking
                c. vit D 1000-2000 IU daily
                d. Calcium 1000-1200 mg per day for post-menopausal women

2. **Peripheral Neuropathy**
    Some chemotherapy agents can cause this. Presents as:

a. Parasthesia, numbness, imbalance, pain, or weakness in hands or feet depending if sensory or motor nerve are affected
b. Do you usual history and physical for neuropathies, including chemo on your DDx as aetiology
c. Medications to help with these symptoms to consider are:
    i. Analgesics: Acetaminophen, ibuprofen, opioids
    ii. Anticonvulsants: Gabapentin, topiramate, pregabalin, carbamazepine, phenytoin
    iii. TCAs: Amitriptyline, nortriptyline
    iv. Alternatives to Medicine: Acupuncture, capsaicin cream, biofeedback have not been studied very rigorously

3. **Lymphadenopathy**
   Look for this on the ipsilateral arm of the breast cancer, particularly if there has been: mastectomy, axillary node dissection and/or radiation therapy.
   This is a very difficult side effect to deal with and can put at increased risk for infection in that arm as well as the discomfort of the oedema itself. However, there are a few recommendations we can propose to help:
   a. Exercise: the muscle contractions can help facilitate the drainage of the lymph towards the torso. Focus on mobilization, not strenuous activity
   b. Physiotherapy and often RNs/LPNs with special training can do manual lymphatic drainage.
   c. Compression therapy, using bandages, or gradient pumps to help move the lymph towards the corso. And you can definitely combine all three of these options

***Can consider adding the recent CMAJ article on lymphoedema here** Too long I think*

4. **Cardiac Dysfunction**
   This is quite a rare complication. But can happen with specific chemotherapies or left sided chest wall radiation therapy.
   a. Of course, if symptomatic, workup as you would anyone with suspected cardiac pathology: ECG, echocardiogram, referral to cardiology

5. **Leukemia or Myelodysplasia**
   Rare complication following some chemotherapies.
   - if you see abnormal CBC or peripheral smear, a referral to haematology needs to be considered

The longer term challenges are significant, and will need to be considered as well. Some of these include:

1. **Fatigue**
   Need to think of both physical and psychological factors:
   a. Physical
      i. Pain
      ii. Medications and other treatments that might cause sleep disturbances
      iii. Chemotherapy-induced anaemia
      iv. Nutritional deficits
      v. Recurrence of disease
   b. Psychological
      i. Depression and/or anxiety. Ensure you are actively screening for this

2. **Sexual Health**
   A number of difficulties can present for your patient after treatment of breast cancer:
   a. Intimacy issues
      Don't hesitate to ask about this as a normal part of the follow-up visit discussions.
      i. Painful intercourse or lost sensation
      ii. Menopausal symptoms and decreased libido
   b. Self-image can suffer, particularly following significant lumpectomy or mastectomy.
      i. Consider referring for more information on breast prosthesis or reconstruction as available in your area
      ii. Psychological counselling can also be helpful for body-image, and relationship concerns
   c. Menopause Symptoms can often result from endocrine/hormone therapies. Chemotherapy can also cause early menopause.
      Of course hormone replacement are often not recommended for women with prior breast cancer due to risk of recurrence.
      i. Hot flashes can be helped with non-hormone treatments such as Venlafaxine or Gabapentin
      ii. Dyspareunia and vaginal dryness due to vulvovaginal atrophy, can be managed with:
         1. Smoking cessation, avoiding scented soaps
         2. Vaginal moisturizers and lubricants
         3. Unclear guidance regarding topical estrogen due to lack of safety date
         4. If refractory, refer to your gynecology colleague or sexual health experts

d. Fertility and Family Planning
Pregnancy while on endocrine/hormone therapy is contraindicated.
Because of risk of recurrence, non-hormonal contraception is recommended. So think of condoms, or copper IUDs.

3. **Genetic Counselling**
All women from high-risk families, based on family history, should be offered referral for genetic counselling.

4. **Psychosocial Support and Resources**
Hold tight, we will discuss some of these options in part C of this objective.

b) Consider and diagnose metastatic disease in the follow-up care of a breast cancer patient by appropriate history and investigation.

The premise of this objective is to imagine your patient has been diagnosed with breast cancer, treated by an oncology team with lumpectomy or mastectomy as well as adjuncts such as radiation, chemotherapy or hormone therapy. Once this is completed, you are going to receive them and be responsible for supporting them.

The Alberta Provincial Breast Tumour Team has developed guidelines for follow-up care of early-stage breast cancer. For ALL patients who have completed medical or radiation treatment they suggest:

1. Self-examination of Breasts
This might cause you confusion because we have been trained that this is never suggested, but that is ONLY regarding screening. However, they do recommend educating the patient following breast cancer treatment for surveillance and to empower them.
2. Clinical Breast Exam
They suggest doing this every 6 months for the first two years, and then annually for perpetuity
Should include:
- focused history
- physical exam of: breasts, chest wall, supraclavicular lymph nodes, axillary lymph nodes, auscultation of the chest and palpation of the liver
3. Imaging:
- Mammography - one year after the diagnostic mammogram, then annually. This is for remaining intact breasts. Of course a fully reconstructed breast is not recommended as there is no natural breast tissue there.

- CTs, bone scans, ultrasounds, tumour seromarkers ets are not recommended for the asymptomatic patient

Symptoms of local recurrence or metastatic disease and the recommended investigations

Following with this same guideline document, here we list some signs and symptoms that need to be investigated to look for recurrence or metastatic spread of your patients treated breast cancer, which would most often be to liver, brains, bones and lungs.

Symptom	Action / Investigation
new mass in breast	mammography +/- ultrasound +/- needle biopsy
new suspicious rash or nodule on chest wall	refer to surgeon for evaluation and biopsy
new palpable lymphadenopathy	refer to surgeon or interventional radiology for biopsy
new persistent bone pain	plain x-ray of affected site(s) and bone scan
new persistent cough or dyspnea	chest x-ray and/or CT chest
new hepatomegaly or RUQ abdominal pain or jaundice	ultrasound and/or CT scan of abdomen and liver enzymes
new onset seizures	seizure management (as required) and CT/MRI brain
back pain with limb weakness, change in sensation, change in reflexes, or loss of bowel/bladder control	MRI spine
new persistent headache or new concerning neurologic deficits	CT / MRI brain
altered level of consciousness, nausea, vomiting, and/or pain with symptomatic hypercalcemia	IV hydration and bisphosphonate therapy

c) Appropriately direct (provide a link to) the patient to community resources able to provide adequate support (psychosocial support).

As an example, the Alberta Provincial Breast Tumour team endorses guidelines produced by a group called “Rethink Breast Cancer”. They are a charity out of Toronto who provides a TON of information for patients, with guidelines, which will be linked to in the shownotes https://rethinkbreastcancer.com/wp-content/uploads/2015/08/CareGuidelines-Digital-1.pdf

They are largely focused on an underserved demographic of young women, 40s and under, with breast cancer. They cover the whole gamut from pre-diagnosis, the science behind diagnoses, exercises that can be useful, finances, information for friends and family, side effects of treatments and how to deal with them and more and more and more. A really great resource.

For in person support resources, you are going to have to search for the local services available to you, as this will of course vary across the country. Calgary, for example, has a service called “Breast Cancer Supportive Care” which requires a formal referral from you, the GP> There is a fillable pdf of the form on the website

https://www.breastcancersupportivecare.ca/pages/programs and offers many of the same services as re-think, but of course with in person visits.

In a pinch you can refer to, or have the patient look at, the Canadian Cancer Society website, which offers a community services locator https://csl.cancer.ca/en You simply put in the community the patient lives in, and search terms of what they are looking for. For example I just put in ‘Halifax’ and ‘Breast Cancer’ and found a ton of resources including ‘Bosom Buddies’ dragon boat group, a Breast Cancer Support Group, the Canadian Cancer Society local chapter and loads more resources.