



Primary care for cancers at diagnosis and follow-up: a narrative review

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Abstract

This paper is concerned about the family physician's role in early cancer diagnosis and follow-up with his/hers patients who have just been diagnosed with cancer; treatment modalities for cancer; and family physician continuous roles for patients who are under definitive cancer treatment, experiencing side-effects of cancer treatment; some of the effective means to reduce these side-effects during cancer treatment and management of oncologic emergencies. Having some knowledge on the current cancer therapies would undoubtedly help family physicians to follow up patients with cancer more confidently, to appreciate their side-effects, symptomatic treatment, recognize the limit of primary care and be even useful for counseling and consultation with patients or their family members with a family history of cancer. Systematic searches with terms comprised "cancer", "malignancy", "primary care", "general practice", "cancer AND diagnosis" and "cancer AND follow-up" were done in the major databases such as Pubmed, ScienceDirect and Ovid. We employed selective searches with the above terms and their combination in some of the major journal such as The Lancet Oncology, The Lancet, New England Journal of Medicine, etc. These were followed by snowballing the relevant articles from the citation of references in those selected papers. The goal of this narrative review is not to provide exhaustive documentation of sound evidence for practice of primary care for cancer patients at diagnosis and follow-up. It mainly aims to provide specific evidence-based information and suggestions that are thought to be relevant for primary care professionals and policymakers.

Keywords: Cancers, Primary care, General practice, Office visits, Diagnosis, Survivors

Primary care for cancers at diagnosis

Although dealing with new cancer diagnoses is a relatively rare experience to many primary care physicians, but dealing with the possibility of cancer is an everyday occurrence. It was reported that a full-time general practitioner in Britain will have a new cancer diagnosed each month [1]. A late diagnosis of cancers is not unusual, even on common cancers (breast, prostate, lung, and colorectal) in developed countries [1]. Thus, most cancers were not identified

as a result of screening but were diagnosed following presentation with symptoms [2], even as an emergency presentation [3]. As there is a generally long period of symptoms before presentation to a doctor, efforts should be made to increase symptom awareness, thus producing earlier presentation and diagnosis [4]. For evidence-based information and guideline on clinical diagnosis and investigation of cancers at primary care level, readers are recommended the New Zealand Guideline Group publication

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on Suspected Cancer in Primary Care [5].

Primary care physicians' role in cancers diagnosis

One of the main roles of primary care is the early diagnosis of cancers. This is possible when there is a high index of awareness of unexplained symptoms and signs. Prompt recognition of these clinical clues might be the only screening tool that primary care has for many cancers that are yet to have proven screening tests; these cancers include nasopharyngeal carcinoma, lung cancer, ovarian cancer, etc. The real challenge for primary care lies in relatively few encounters of and personal experience with cancer patients within the vast clinical context of undifferentiated symptoms, since many symptoms associated with cancers are indeed common symptoms of many benign conditions. However, primary care should be alerted of cancer possibility when there were unexplained and persistent symptoms and signs in an otherwise high risk patient. Heightened awareness of a cancer in a high-risk person returning to a primary care practitioner with the same symptom three or more times should initiate appropriate investigation or even an indication for referral. Primary care physicians are required to have a high index of suspicion of a new primary or metastatic disease (especially bone, brain, liver or lung) in a person with a history of cancer [5]. However, there should not be undue practitioner delay with respect to undertaking investigations in the primary care setting. Patient and practitioner delay often accounted for as much of the treat-

ment delay when compared to delay in the hospital setting [6]. A systematic review reported that patient delay was greater than practitioner delay for upper gastrointestinal cancers [7]. However, practitioner delay were more often than patient delays in childhood cancer [8].

Assessing cancer possibility amongst the children will be even more challenging. Primary care physicians should take careful heed of the parents' or care-giver's opinion and cues. Further investigations are warranted in the diagnostic work-up of possible cancer presented with atypical features. Nevertheless, in patient who complain of typical symptoms and present with typical signs of a certain cancer, investigation should not delay urgent specialist referral [9]. Doctor-patient-family rapport and trust is ever more important in this aspect of primary care. Patient's trust appears to be enhanced by the physician's perceived technical competence, honesty, and patient-centered behavior. A trusting relationship between patients, their family and the physician will result in facilitated communication and medical decision making, decrease in patient's fear and improve treatment adherence [10]. These qualities are built from past encounters between the patient and practitioner and will prove to be crucial for successful cancer diagnosis and follow-ups.

Patient concern

The diagnosis of cancer often comes with an overwhelming shock to many individuals have or have they not suspected it prior. Some patients may be in denial or feeling of guilt at diagnosis [11]. This

diagnosis meant shortened life-span and unscheduled departure of a significant person from a family or organization. That imminent future is preceded almost immediately by decisions of treatment and demands of altered lifestyle and routine which might involve family members as distant as the third generation. The impact of being diagnosed of a cancer is only getting larger, harder and more real over the process of treatment and its side effects. The pain and other constitutional symptoms are disrupting routine of life severely. Cancer is one of the terminal illnesses that crumble the patient's psychological, emotional and spiritual integrity seriously. This might, in turn, interfere with their physical condition and adherence to medical therapy. Patient with a cancer is almost always caught up with the sudden diagnosis, demoted from autonomous self in the many decisions, distracted from career path, displaced from life's plans and routine, deemed weak from the illness, and find him/herself at the receiving end of many assistance and goodies from well-wishers. All these events threaten the self value system and challenge life purposes, even in the spirituality of a patient. Understanding and support in these areas are often in dire needs yet not consciously aware of nor appreciated by the patient. Nevertheless, this mismatch of expectation and needs should not deprive the patient of the appropriate and timely supports because this support is crucial to the adherence to and success of therapies, and ultimately to the improvement of the quality of life. Men with cancer might have similar support needs to women patients but might be



more reticent about using support services.

Physician concern

Patient-centered care and patient-centered communication are critically therapeutic as they allow information exchange, fostering therapeutic rapport, recognizing and responding to emotions. This relationship will facilitate in managing uncertainty and making decisions that enable patient self-management and thus expedite attainment of the sense of familiarity with the disease as well as informed expectation of future hospital specialist care [12,13]. Support and information provision to patient with cancer or possible cancer should take into consideration of their cultural background, value and preference. Unless specifically excluded by the patient, other family members should have the opportunity to be involved in decisions about the patient's care and treatment [9]. Patient decision aids is an effective intervention for integrated care that improve patient participation in informed

decisions about their own healthcare [14]. Other information to be relayed at the time of specialist referral includes:

- Where the patient is being referred to
- When is the appointment
- What to expect at the first visit
- Who is the specialist consulting the patient
- Bringing family members
- Where to look for more information on the type of cancer
- How long to expect in getting to the diagnosis
- How to cooperate with the specialist and team for future treatment
- Reassurance of availability of the current relationship for consultation and discussion
- Other sources of support both tangible and intangible such as financial, social, counseling, etc.

Primary care professionals should be aware that male patients do have similar support needs to women and may require extra tact in introducing them to the available support services [9].

After all, adequate skills in breaking bad news, availability of privacy space and knowledge of grief process are indispensable in primary care for patient at the first diagnosis of cancer.

Primary care for cancers at follow-up

Cancer survivorship is improving in tandem with advances in cancer treatment. Meaningful survivorship is conceived to go beyond living with cancer and its treatment, to living most healthy and active life for the longest duration possible for the patient including the significant family members [15]. Family physician has definite roles with his/hers patients who are under definitive cancer treatment (second phase), after completion of treatment (third phase) and when treatment fails with inevitable death (fourth or final phase) [16]. Some of these follow-ups involve continuing comorbidity management for concurrent chronic diseases, behavioral modification counseling and psychological distress support [17]. These roles by

Table 1. Evidence-based dietary self-management recommendations

Food	Advice
Saturated Fats	Unless underweight, reduce or avoid processed fatty foods, cakes, biscuits, crisps and other fatty snacks, pastries, cream, and fried foods. Cut the fat off the meat and check serum cholesterol regularly.
Fish	Increase intake of all fresh fish, but particularly the oily varieties such as mackerel and sardines.
Essential minerals	Vary the diet to ensure intake of adequate quantities of essential minerals consider; mixed nuts, brazils; seafood including sardines, prawns and shell fish; Pulses and grains. Vary carbohydrate sources such as pasta, rice, different brands of potatoes, pulses such as lentils and quinoa.
Dietary Vitamins	Fresh fruit, raw and calciferous vegetables, grains, oily fish, nuts and salads. Unless having diarrhoea, increase the amount of ripe fruit each day, ideally by eating the whole fruit. Freshly squeezed fruit juices are recommended.
Polyphenols	This contains in onions, leeks, broccoli, blueberries, red wine, tea, apricots, pomegranates, chocolate, coffee, blueberries, kiwis, plums, cherries, ripe fruits, parsley, celery, tomatoes, mint, citrus fruit.
Phytoestrogens	This contains in soybeans and other legumes including peas, lentils, pinto (baked beans), and other beans and nuts (supplements not recommended).
Increase Carotenoids (Lycopene)	This contains in tomatoes, tomato sauce, chilli, carrots, green vegetables and dark green salads.



Table 2. Evidence-based physical activity recommendations

Physical Activity	Benefits
Resistance Exercise	Reduce risk of cancer reoccurrence and mortality, reduce fatigue, and improve lean body mass and muscle strength. Personalized, tailored resistance exercise based on fitness assessments can improve QOL.
Aerobic Exercise	Reduce risk of cancer reoccurrence and mortality, reduce symptoms of lymphoedema, prevent loss of bone mineral density, and reduce body fat. Walking was particularly popular and beneficial.
Combined Resistance and Aerobic Exercise	Reduce risk of cancer reoccurrence and mortality, reduce symptoms of fatigue and improve QOL.
> 3MET-hours per week.	Benefits of physical activity require 3 or more MET-hours per week (e.g. using a stationary bicycle for one-hour).
Moderate intensity	Physical activity needs to be of at least moderate intensity in order to offer beneficial outcomes.
Dose-Response	Exercise can be dose-responsive, thus taking part in more than 3 MET-hours per week is likely to offer greater benefits.
During Treatment	Remaining active during treatment can help with symptoms such as fatigue and increase completion rates for chemotherapy.
Home-Based	Home-based physical activities are effective in improving cancer outcomes, including reducing fatigue and protecting bone mineral density.
Supervised	Supervised physical activity either at home, in groups, or during treatment are effective in improving cancer outcomes, reducing lean body mass and facilitating the completion of chemotherapy.

QOL= quality of life

the family physician are expressed by both the cancer patients and oncologists alike, although are somewhat uncertain on the part of primary care physicians themselves [17]. Australian general practitioners who have good relationship with hospital specialists are reported to be more confident in co-managing patients with colorectal cancer [18]. The main aims of cancer follow-up are complications monitoring, early recurrence detection, management of treatment side-effects and psychosocial support [19]. The outpatient cancer follow-up and review is preferred by the patients and care givers [20].

Most hospital specialists offer continuing care for cancer patients during treatment and some provide lifelong follow-up post-treatment. With proper follow-up guidance, colon cancer patients with follow-up led by hospital surgeons or general practitioners experience similar outcomes (recurrence, time

to detection and death rates) [21]. Family physicians should remain involved and informed of their patient's treatment progression during the second phase to be able to offer informational/emotional support to the patient and family with regards to the cancer symptomatology [17]. This should allow proper attention to be given to health concerns, routine medical care and vigilance for more healthy lifestyles for other siblings and family members. National Cancer Survivorship Initiative (NCSI) in Britain has produced an evidence-based self-management advice for the cancer survivors, in particular with regards to dietary (Table 1) and physical activity (Table 2) [22]. Table 3 has some suggested nutrition and physical activity according to selected cancer sites [23]. In order to deliver this care effectively, there are at least three core skills primary care professionals should have:

1. Patient-centred care i.e. communica-

tion skills, risk assessment and care planning.

2. Behavior change capabilities i.e. motivational interviewing, goal setting and problem solving.

3. Organizational change i.e. evidence-based healthcare and multidisciplinary working.

As a friend and confidant, family physicians would be in a position to discuss alternatives and to support whatever final decision in regards to medical treatment that is made by the patient. A high index of suspicion of a new primary disease or metastasis is needed in a person with a history of cancer returning to a family physician with recurrent similar symptoms [5]. Lastly, whether the patient and his or her family members choose to receive end-of-life care in the hospital, hospice or at home, the primary care physician should remain available for timely discussion with the patient and family [24]. Family physi-



Table 3. Nutrition and physical activity issues by selected cancer sites

Selected Cancer Sites	Issues	Nutrition	Physical Activity
Breast	Not to be over-weight. Preserving or rebuilding muscle mass.	High amounts of fruits, vegetables and whole grains. Low fat diet. Lower intakes of added sugar, refined grains, and animal products.	Progressive resistance training.
Colorectal	Not to be obese	High intakes of fruits and vegetables, poultry and fish. Normal Vitamin D status.	Regular physical activity
Endometrial	Not to be obese	Healthy balanced diet.	Regular physical activity
Ovarian	Not to be obese	Green tea. Milk consumption. High intakes of fruits and vegetables.	Regular physical activity
Haematologic	Not to be overweight or obese	A low-microbial or low-bacteria diet- primarily a cooked-food diet.	Regular physical activity
Lung	Healthy weight	Foods that is energy-dense and easy to swallow. Better vitamin D status.	Regular physical activity
Prostate	Not to be obese	Low intake of foods from animal sources. Low saturated fats. High intakes of fish and phytochemical-rich vegetables (eg. tomato) and fruits. Increased consumption of soy foods (eg. tofu and soymilk) and ground flaxseed may be helpful. At least 600 IU of vitamin D per day and to consume adequate amounts of calcium (not exceeding 1200 mg/day).	At least 3 hours per week of vigorous activity.
Upper Gastrointestinal and Head and Neck	Poor nutrient intake can stem from difficulties in biting, chewing, and swallowing from xerostomia, mucositis, and taste alterations resulting from cancer therapies.	Patients are encouraged to eat soft, moist foods to maintain their swallowing function. May require placement of either a gastrostomy tube or a jejunostomy tube, depending on anticipated or performed surgical interventions Pureed or blenderized foods may be better tolerated during treatment and recovery. Acidic, salty, or spicy foods and foods at extreme temperatures may not be well tolerated. May need iron and calcium and vitamin B12 supplements. Sugar-free gums and mints, and the use of commercial oral rinses and gels and the consumption of water may provide relief of symptoms and enhance appetite. Diet modifications involve small, more frequent meals/snacks, no concentrated sweets, and the consumption of fluids between meals due to early satiety. In addition, patient may need to be advised against eating 3 hours before bedtime to avoid aspiration.	Regular physical activity

cians providing this supportive care should be competent in ethical issues such as advance directives, advance care planning, surrogate decision making and (healthy) organ donation [25].

Treatment for cancers

The mainstays of cancer therapies remain as surgery, radiotherapy and chemotherapy. The relative contribution of each mode of therapy is decided by the natural history of the specific cancer. Outcome of treatment depends on factors in relation to healthcare personnel

(including surgeons), patient and health-care environment and infrastructure. Health care personnel-related factors include surgical skills, volume of surgery, specialization, adequacy of support staff, etc. On the other hand, patient related factors include the patient's diligence in following complex treatment plans, compliance with follow-up regime, symptom surveillance for early detection of complications, recurrence and metastasis, nutrition and physical activity, psychosocial state, emotional state and existing co-morbidities. Furthermore,

infrastructure-related factors include the adequacy and level of sophistication of treatment resources and outreach services to provide psychosocial support and rehabilitation to the patient [26].

Early cancer is usually treated with surgery. It could be even be curable if the cancer was in-situ. Surgical treatment for early cancer is often more beneficial than watchful waiting, this is well observed in prostate cancer patients over 15 year follow-up study in Sweden, Finland, and Iceland [27]. During the last two decades, several large observational studies in the



U.S., Canada and the Netherlands have also shown that the pancreatic resections affect patients' outcomes [28]. The standard indication is less-mutilating body part-surgery and function-preserving surgery over more extirpative procedures except where indicated. There is an international consensus for multimodality therapy if the cancer is in advanced but at operable stage.

1. Adjuvant Therapy

Adjuvant therapy is used after primary cancer treatments, such as surgery or radiation. These include chemotherapy, immunotherapy, hormone therapy and targeted therapy. This additional therapy aims to supplement and to increase remission rates of the cancer.

2. Neo-adjuvant Therapy

Neo-adjuvant therapy is additional therapy given before the primary treatment. It aims to convert unresectable cancers to resectable or to increase the probability of complete microscopic tumor resection. In other words, it is an attempt to downstage and increase the conversion of the cancer to potentially curable disease. This usually employs preoperative radiotherapy.

3. Neo-adjuvant Chemo-radiation Therapy

In this more recent combined therapy for a more advanced disease, preoperative chemotherapy and radiotherapy is given in sequence prior to the primary cancer treatment to achieve more local control, leading to lower local recurrence rates when compared to preoperative radiotherapy alone.

Hyperthermia, the heating of tumors to between 41-43 degrees Celsius, could nowadays be considered the fourth pil-

lar of the treatment of cancer beside surgery, radiotherapy and chemotherapy. It restores the chance of surgery for inoperable tumors and allows lower dose radiotherapy of relapsed cancers without increasing toxicity. Thus, hyperthermia increases both local control and overall survival [29].

Pharmacogenomic studies in oncology involving an investigation into the genetic basis of drug response is capable of providing patient's genomic information that would optimize personalized cancer chemotherapy [30]. These targeted therapies tailored to individual genomic profiles are fast becoming a reality for patients with advanced gastric cancer as well as head and neck cancer [31,32]. Tumor tissue biomarker, such as estrogen receptor testing, has been routinely performed since the 1980s, on breast carcinoma samples to determine whether hormonal therapy is indicated. Today, estrogen receptor, progesterone receptor and human epidermal growth factor receptor type 2 testing are standards of care to guide treatment decisions. In recent years, multi-gene assays have been introduced to predict breast tumor behavior. In particular, the OncotypeDx and MammaPrint assays have been commercialized and are used in North America and Europe to guide clinical decisions [33]. An association between somatic mutations in epidermal growth factor receptor (EGFR) and response to EGFR tyrosine kinase inhibitors (TKIs) has made personalized treatment of non-small cell lung cancer (NSCLC) possible [34].

Passive cancer immunotherapy with tumor-targeted monoclonal antibodies

has been reported to have much therapeutic efficacy [35]. Ipilimumab (Yervoy, Bristol-Myers Squibb) is such an antibody for the treatment of advanced melanoma. Cancer immunotherapy has achieved another milestone in recent successful clinical trials using cytotoxic T-lymphocyte associated antigen that effects a programmed death 1 (PD-1) protein and one of its ligands (PD-L1) expressed by the tumor cells, leading to enhanced T-cell antitumor activity [36,37]. This novel immunotherapy has been shown to induce tumor regression in up to 30% of patients with non-small-cell lung cancer, melanoma, renal-cell cancer and ovarian cancer; and more than half of these responses lasted to more than one year [36,37].

Complementary and alternative medicine for cancers

A sizable portion (44%) of patients with ovarian cancer receiving chemotherapy in UK and Canada were also complementary and alternative medicine (CAM) users. Motivations for CAM use claimed to assist healing (60%), boost the immune system (57%), improving the quality of life (48%), and relieving symptoms (45%). Thirteen percent of cancer patients in that study thought CAM could cure cancer, whereas 17% believed it would prevent recurrence [38]. Dietary supplement use range from 64% to 81% among cancer survivors and as many as one third of cancer survivors initiate supplement use after their diagnosis [39,40].

Extensive preclinical data are indicating a possible role of antioxidant supplements as anticancer agents. How-



ever, positive evidence from properly conducted clinical trials remains quite limited. Examples include high-dose vitamin C in cancer treatment, melatonin supplementation in solid tumors, dl- α -tocopherol and β -carotene in lung cancer, selenium, vitamin E and CoQ10 in prostate and ovarian cancers [41]. A phase II open label study that investigated the efficacy and safety of a multi-agent protocol that included the antioxidants α -lipoic acid (300 mg), vitamin E (400 mg), and vitamin C (500 mg) may also prevent or ameliorate cancer cachexia [41]. The combined use of β -carotene and vitamin E supplements in conjunction with radiation therapy is said to be contraindicated. Supplementation with a GSH-repleting agent, such as undenatured whey-protein derivative, has been shown to improve weight gain and increase levels of reduced glutathione [41]. Patients with cancer are reported to take antioxidant supplements in combination with conventional chemotherapy and radiotherapy hoping to enhance innate anticancer activity and to reduce the treatment side effects. However, chemotherapy agents vary in their risks for interaction with antioxidant supplements reducing the efficacy of the chemotherapeutic agent. As few randomized controlled trials have addressed the use of antioxidant supplements during cancer treatments, primary healthcare providers should be cautious about recommending antioxidant supplements until further research is available to guide clinical practice [41]. The American Cancer Society has some general guidance on supplements use by cancer patients as below [23]:

- All attempts should be made to obtain needed nutrients through dietary sources before supplements are prescribed or taken.

- Supplements should be considered only if a nutrient deficiency is either biochemically (eg, iron deficiency, low plasma vitamin D levels, B12 deficiency) or clinically (eg, low bone density) demonstrated.

- Supplements should be considered if nutrient intakes fall persistently below the recommended intake levels. Such a determination should be made by a registered dietitian. This follows an emerging data that suggest higher nutrient intakes, especially through non-foods sources may be harmful rather than helpful.

Reflexology did not appear to improve breast cancer pain and symptoms convincingly [42]. *Triphala* (in Sanskrit tri= three and phala= fruits) is composed of the three myrobalans, *Terminalia chebula* (Haritaki), *Terminalia belerica* (Bibhitaki), and *Phyllanthus emblica* or *Emblica officinalis* (Amalaki or the Indian gooseberry) and was claimed to have chemopreventive, radioprotective, and chemoprotective effects from in vitro and animal studies [43]. Robust clinical randomized controlled studies are lacking in many traditional remedies that are popular among the cancer patients. Primary care physicians should not rob patient's effort and right in testing out these treatments but to stay informed of patient's value and making sure these remedies are not seriously harmful.

Side-effects of cancer treatment

Chemotherapy and radiotherapy are

generally causing the same ablative effect on the tissues-organs, more of this side-effect is seen with the less selective chemotherapy agent and wider-area and higher dose of radiotherapy. The unwanted side-effects are inflammation and its related sequelae, leading to loss of function of the affected tissue-organ; and worst of all is the DNA damage that leads to cancer. These potential side-effects are mostly seen in the active tissue, which explains why children and adolescent are more sensitive and susceptible to chemotherapy and radiotherapy. The late therapy-related complications and adverse effect are more commonly associated with paediatric survival. The Childhood Cancer Survivor Study reported that childhood cancer survivors experienced 4.6 fold higher risk of gastrointestinal malignancy compared to the general population [44]. Knowing that late effects are frequent and can be expected in $\geq 70\%$ of survivors would heighten family physicians' awareness to recognize and deal promptly with these problems when they occur [45]. Nevertheless, side effects of cancer treatments are generally short-term. Patients recover between weeks to months after the treatment is over. Supportive care is basically symptomatic but with utmost effort and efficacy to improve their quality of life. Both medical and psychological interventions are often needed in tandem to improve personal comfort, familial integration and mental relief.

Acute chemotherapy-induced emesis and delayed nausea and vomiting are among the most common cancer chemotherapy side-effects that demand effective



tive anti-emetics for reasonable quality of life. 5-hydroxytryptamine-3 (5-HT₃) serotonin receptor antagonists such as ondansetron was often combined with dexamethasone in order to achieve better control of emesis [46].

Some examples of late side-effects or complications of cancer treatment include persistent fatigue, peripheral neuropathy, changed sense of taste, difficulty chewing and swallowing, difficulty in replenishing lean body mass and persistent bowel changes such as diarrhea or constipation. Supportive care, including nutritional counseling and pharmacotherapy to relieve symptoms and stimulate appetite (eg. megestrol acetate), is helpful in the recovery process [47]. Nutrient-dense beverages and foods can be consumed by those who cannot eat or drink enough to maintain sufficient energy intake. There were novel agents such as oral glutamine preparation and palifermin (a recombinant form of human keratinocyte growth factor) in management of treatment-associated mucositis and stomatitis.

Appropriate assessment of fatigue, psychological support, patient coaching of self-care with diary keeping and information leaflet at home were found not only enabled patients to live with fatigue but also improved their psychological/emotional well-being leading to better coping with illness and treatment [48]. Maintaining good haemoglobin level (Hb \geq 11 g/dl) and avoiding anemia was shown to correlate with quality of life and shorten hospitalization for elderly cancer patients undergoing chemotherapy [49]. Proactive use of growth factors such as prophylactic granulocyte-colony stimulating factor (G-CSF), pegfilgrastim, etc. [46] given together with chemotherapy increases the risk of bone marrow suppression and GI toxicity from cytotoxic agents.

The routine use of indwelling intravenous catheters has enhanced the convenient delivery of anti-neoplastic therapy. However, this carries with it risk of thrombosis and infection even sepsis. The risk of thrombosis is higher with multiple attempts at insertion of the larger sized catheters, mal-positioned and infected device. The utility of al-fimeprase, a fibrin degradation agent, and an indwelling central venous catheter coated with chlorhexidine and silver sulfadiazine has been promising in reducing both complications respectively [46].

Quality of life with cancers

Improving quality of life (QOL) by educating patients about the fundamental issues related to love, intimacy and sexuality has been an effective intervention for patients with cancer. Patients who have received the interventions with improved QOL live twice as long [50]. Practical advices on healthy nutrition and physically active lifestyles are essential to help in the recovery process and to improve fitness [47,51]. Prospective, observational studies have demonstrated that physical activity is associated with a reduced risk of cancer recurrence, improved morbidities (eg. lymphoedema) and mortality among cancer survivors with history of breast, colorectal, prostate or ovarian cancer [47].

Children survivors with central

nervous system tumor have significant psychosocial problems. Those children who had cranial radiation therapy, who were female and at young age during diagnosis of cancer were associated with negative psychosocial outcomes (academic achievement, employment, self-esteem, social functioning and development) [52]. Primary care after childhood leukemia faces many challenges [53]. Children treated for cancer may not experience normal development such as achievement of normal developmental milestones and regular school attendance could be prevented by health limitations. Children survivors face the risk of other tumors after radiation therapy. These include brain tumors, parotid gland tumors, thyroid cancers, basal and squamous cell carcinomas, and sarcomas of the soft tissue and bone. Studies of leukemia survivors have demonstrated an increased prevalence of metabolic syndrome compared to the controlled populations. Childhood leukemia survivors demonstrate attenuated bone mineral accretion, which may result in an increased incidence of osteopenia, early onset osteopenia, or both. Growth hormone deficiency is the most common neuroendocrine complication after leukemia therapy and is associated, in a dose-dependent fashion, with exposure to cranial radiation. Childhood leukemia survivors are reported less likely to graduate from college, to be fully employed, or to obtain health insurance when compared to their siblings.

When to consider palliative care?

It is important and much appreciated by the patient and family members to



discuss end-of-life care at an early stage. Timely palliative care allows for adequate control of symptoms throughout the period of disease [9]. For a patient with advanced disease, direct referral to the palliative care service at first presentation is appropriate [5]. However, referral is not to be defined by prognosis but rather the individual needs of the patient following systematic evaluation. Such a model of care acknowledges people do not always need specialist services; instead their current care by primary care professionals is adequate to meet their needs. Therefore, every primary care physician providing care and support to people with cancer should have a working understanding of symptom control, psychosocial care and how to optimize a person's function. Most of the issues span several domains in physical, sexual, emotional, spiritual/existential, social and financial. Specialized palliative care service has been beneficial to patients with advance cancer, care-givers and

health funders [26].

Oncologic emergencies

Almost all of these emergencies require definite management and specific treatment by relevant hospital specialists but with early identification and referral from primary care physicians, the chances for successful intervention will be higher [54]. One of the oncologic emergency categorization is based on organ-systems such as metabolic, cardiovascular, infectious, neurologic, hematologic and respiratory.

Bone pain, passing out stone, abdominal pain and changes in sensorium may indicate underlying hypercalcemia. The mnemonic "bones, stones, moans, and groans" is used to emphasize skeletal pain, nephrolithiasis, abdominal discomfort, and altered consciousness as presenting symptoms. Bone pain is usually caused by discrete metastases. Abdominal pain can arise from unregulated intestinal motility, pancreatitis or severe constipation. Altered sensorium can occur along a spectrum from lethargy to coma. In addition, hypercalcemia could shorten the QT interval and produce arrhythmias. Urgent treatment is needed for life-saving and symptomatic relief. Rapid intravenous infusion of normal saline (300-500 mls/hour) and intravenous frusemide (20-40 mg every 12-24 hour) after adequate hydration is the appropriate therapy[54].

Hyponatremia may be asymptomatic or present with lethargy, delirium, seizure and

coma. Electrolyte disturbance that happens acutely within 48 hours will usually be symptomatic. Complete diagnosis of hyponatremia includes accurate evaluation of sodium and water balance, either it is of hypervolemia, or euvolemia, then appropriate treatment could be instituted. Thus, urgent referral is advised for patient with suspected hyponatraemia [54].

Tumor lysis syndrome (TLS) may be diagnosed when one or more of 3 conditions arise: acute renal failure (defined as a rise in creatinine to 1.5 times or more the upper limit of normal), arrhythmias (including sudden cardiac death), and seizures. TLS is more common in bulky, solid and proliferative malignancy; increased risk is seen in liver metastases. Its onset could be delayed by days to weeks following chemotherapy, radiotherapy, surgery or any ablation procedures. With its multiple electrolyte derangement and end-organs involvement, usual general emergency measures are involved for safe and urgent referral to be executed [54].

Cardiovascular emergencies include pericardial effusion, cardiac tamponade and superior vena cava syndrome. These are due to either direct or metastatic involvement of tumor at the pericardial sac or neck tissue, causing transudative effusion and compression respectively. Prompt recognition and referral permit completion of diagnostic work-up and definitive therapy to begin [54].

Neutropenic fever is the infectious emergency because a patient with cancer has reduced ability to mount an inflammatory response, thus can limit localizing symptoms and signs but only

Beneficial To Patients

1. Pain assessment and control
2. Meeting personal care needs
3. "Quality of dying" and comfort in the last hours of life
4. Satisfaction with care

Beneficial To Care-givers

1. Improve satisfaction with care
2. Fewer identified unmet needs
3. Life adjustment
4. Reduce anxiety
5. Improved survival having relinquished the role

Beneficial To Health Funders

1. Reduced inpatient bed days
 2. Reduce number of hospital admissions
 3. Decreased costs when compared to conventional care
 4. Place of death is that of the patient's choosing
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fever. The absolute neutrophil count (ANC) can decline through a cancer's direct interference with haematopoiesis, or most commonly seen as an effect of cytotoxic therapy. The patient is considered neutropenic when the ANC is less than 500/mm³, or the ANC is less than 1000/mm³ with a predicted decline to less than 500/mm³ within 48 hours. If this patient could be ascertained clinically as stable and without other medical comorbidities, and the neutropenia is expected to last less than seven days, then an empirical antibiotic therapy can be administered in the outpatient setting. The oral empiric therapy consists of ciprofloxacin and amoxicillin-clavulanate (both at a dose of 500 mg every 8 hours). The patient is monitored daily to ensure compliance and clinical improvement. If fever persists at 48 hours, the patient should be hospitalized [55].

Malignant spinal cord compression (MSCC) and increased intracranial pressure (ICP) are two neurologic emergencies that are greatly depending on early detection and treatment for favorable outcome. The presentation varies according to the location and severity of the pathology, for MSCC this could vary from back pain to Babinski sign; for increased ICP it could vary from headache to seizure. Definitive treatments administered in hospitals include intravenous glucocorticoid, radiation or surgery [54].

Hyperviscosity syndrome (HVS) may present with neurologic complaints, visual changes and bleeding. These depend on the sites of the affected microcirculation in the body. Symptoms include headache, dizziness, altered mental status, nystagmus, vertigo, atax-

ia, paresthesia, seizure, blurred vision, visual field defect, mucosal bleeding and purpura. HVS comprises increased serum viscosity (SV), polycythaemia vera (PV), hyperleukocytosis or leukostasis if symptomatic. SV is due to excess serum proteins while PV and hyperleukocytosis are due to elevated red blood cells and white blood cells, respectively. Rapid cytoreduction is to be carried in the hospital with plasmapheresis, leukopheresis or induction chemotherapy. Cytoreduction can also be achieved by hydroxyurea[54].

Primary care physician is to suspect a malignant airway obstruction should the patient present with dyspnea, new respiratory symptoms, signs of poor lung expansion, crackles or fremitus. Airway obstruction may result from external compression of the trachea or bronchi by the tumor or an involved lymph node. The mainstay of treatment is stenting via bronchoscopy [54].

Conclusion

Cancer as one of the differential diagnosis is not uncommon in primary medical practice. Primary care is the main setting where cancer could be identified in its early stage, whereby effective treatment with more favorable prognosis could be initiated for the better quality of life [56]. Therefore, clinical acumen and confidence in pre-symptomatic risk assessment, cancer screening and proper referral of a patient newly diagnosed of a cancer are essential skills for family physicians to maintain and to be developed. Well prepared family physicians who are confident in managing patients with a history of cancer would prevent

lost of these patients in transition of care; and be of great resource person in the community. Good working relationship and communication between family physicians and hospital specialists could lead to better shared care opportunity. However, experience with cancer diagnosis and follow-up in daily practice is still relatively lacking in many family physicians. Low consultation rates at primary care level were reported for the long-term survivors of adult cancer patients even in many developed countries [57]. Cancer control strategies need renewed commitment and vigor to empower the primary health care for early diagnosis and effective follow-up of cancer patients. It is possible that additional education and training are needed for primary care professionals in cancer diagnosis of the central nervous system, stomach and pancreas, especially among the elderly (≥ 85 years old) [3], and in the issues surrounding cancer survivorship.

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Conflict of interest

The authors declare no conflict of interest.

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