Hello and welcome to our session on Survivorship Health for Patients with Hematologic Malignancies. I’m Maria Alma Rodriguez. I’m a Professor in the Department of Lymphoma and Myeloma at The University of Texas MD Anderson Cancer Center.

Our session today we hope will prepare you and at the end of the session we hope you will be able to review the incidence as well as the major categories of hematologic malignancies; discuss the clinical course and survivorship implications for those with chronic hematologic malignancies as well as those with aggressive hematologic disorders; review the common systemic treatment strategies as well as identify secondary long-term potential health problems that are related to the treatment as well as the disease categories; and lastly describe the essential components of survivorship health care for patients who survive hematologic malignancies.

To begin with, we’ll discuss the characteristics of the hematologic malignancy disorders, particularly the subtypes of disorders; their frequency of the most common disorders; as well as the clinical course of the chronic versus acute hematologic malignancies and the overall survival outcomes.

To begin with, let us just orient ourselves to the source of the most common hematologic cancers. In the blood stream, two very common leukocytes are the myelocytes and the lymphocytes. The overwhelming majority of malignancies that we treat originate from these two cell lineages.

Furthermore, within each of these subtypes, we have sub-stratification of the disorders. The lymphoid malignancies, for example, are stratified into leukemias, lymphomas, and multiple myeloma, as the three largest categories of malignancies that arise within this lineage. In the myeloid subset, we have the acute and chronic leukemias as well as myelodysplasias. Of the most common disorders that we see in the clinical setting are the chronic leukemias and the non-Hodgkin lymphomas, both aggressive and indolent.

According to the statistics published by the American Cancer Society from the National Cancer Institute Data Repository of malignant incidence, we know that cancers in general are more common in men compared to women. And within the top 10 subcategories of malignancies that present in both men and women, the non-Hodgkin lymphomas are the 7th most common malignancy in men and the 6th most common disorder in women. In men, leukemias follow the lymphomas and as you see in this table both of these disorders are of approximately equal percent distribution.

What we have been observing over the last few decades is that for unexplained reasons it appears that the --- particularly in lymphomas --- in non-Hodgkin lymphomas --- it pa -- - it appears that particularly this category of disorders is increasing in overall incidence. They are as a --- overall and in the whole, these disorders are more common in the older population and the young population, but furthermore even in the older population this is rising in indis --- incidence in all ages but more particularly in the elderly and more predominantly in males.
Now the clinical course of the disease will be different depending on whether the disease is acute versus chronic. So let's talk about the acute leukemias and the aggressive lymphomas. These disorders in general require intensive treatments at diagnosis and the goal of the treatment is to achieve complete remission. Because if unfortunately we do not achieve complete remission, if there is no response of that frontline treatment, the disease is usually quickly fatal. Even in those patients who achieve complete response, if a recurrence does happen, then we need to rescue the patients or we call it salvage the patient with more intensive therapies that usually include stem a --- a plan for stem cell transplant consolidation if the patient is of appropriate age and health characteristics. Durable remissions are possible for both of these categories of diseases and will often equate with cure if the remission lasts beyond a specific number of years.

This is in contrast to the chronic leukemias and indolent lymphomas where the treatment approach is less aggressive while the goal for the frontline treatment is complete remission to a --- to achieve a prolonged stability the patients --- unfortunately the patients' illness unfortunately is rarely curable. Meaning, we anticipate that there will be a pattern of recurrences at various intervals of time throughout the course of the patient's life. We have to consider carefully our treatment selection because treatment toxicities could be additive over time. And, therefore, when we think about the individual's longevity or long-term health and quality of life consequences, the selection of the treatments according to anticipated toxicities is important. From the perspective of the disease, there is also a risk of biologic transformation. That is that the more indolent characteristics of the disease could become more aggressive in a clinical course. And, therefore, we have to change then the treatment strategy of the disease if this transformation does occur.

Just to give you perspective of how commonly we see hematologic disorders at MD Anderson, when we did an analysis of the patients that we were following in our clinics in what we call a long-term survival population, you will see that the hematologic malignancies were 3rd in rank after female breast cancer and a conglomerate of various other subcategories. Hematologic disorders, next to breast, were the single --- as a single category were quite common in our patient population.

This is explainable because of the overall dramatic improvements in survival across the decades since the establishment of our institution. As you see in these graphs, which depict the long-term survival outcomes by decade for Hodgkin lymphoma as well as indolent lymphomas and aggressive B-cell disorders as well as multiple myeloma, you can appreciate that progressively for all of these disorders there has been a successive and continued improvement in long-term survival expectations. Whereas in other disease particularly the solid tumor malignancies, this progressive improvement in survival has not been as dramatic across the decades. Therefore, of course, we are seeing progressively larger or more numerous populations of patients who are living well beyond 5 years with their disease or incomplete remission, hopefully cured of their illness.
Similar survival benefit has been seen across the leukemias as well as you can appreciate in this set of graphs that include both chronic myeloid and chronic lymphoid leukemias and acute myeloid and lymphoid leukemias. You can appreciate from these graphs that the larger, if you will, benefits or the larger outcome changes have occurred in the chronic leukemias. But very encouragingly, we are seeing similar improvement in the long-term outcomes of the acute leukemias. You will also notice in the graph of the acute myeloid disorders that there is what we call a plateau, meaning a flattening of the curve indicating that these patients are not experiencing late recurrences and, therefore, we consider that beyond a point in time these individuals should be considered cured of their primary malignancy.

Now let’s talk about the treatment categories for these disorders because they are different in their --- in the modality as well as in the potential late or latent effects. In the category of localized therapies, we have radiation as well as surgery. And the indication for radiotherapy is both for frontline treatment of certain localized stages of lymphomas and plasmacytomas. It also has a palliative role in patients at the time of relapse in certain subtypes of lymphomas. Surgery is indicated only in very selected cases and in an of itself, it is not considered a curative strategy. But it is an important diagnostic strategy in some cases as well as a --- a, if you will, a consolidative or adjuvant therapeutic strategy. The systemic therapies fall into several subcategories. First of all, we have chemotherapeutic strategies that are applied across the board in frontline and recurrent disease. Immunotherapies similarly are applicable in frontline and recurrent disease. Stem cell transplantation and other cellular therapies are predominantly applicable at the time of relapse. And in very rare and unique situations might be considered as a frontline consolidation strategy for some patients. The radio-immunotherapy conjugates are predominantly used at the time of disease recurrence.

So let’s talk a little bit more --- in more detail about surgery. In lymphomas, splenectomy may be indicated in certain selected lymphoma subtypes. For example, primary splenic marginal zone lymphomas, where the diagnostic as well as therapeutic intervention, would be a splenectomy. There are occasional situations where the lymphoma may present as a partial obstruction in the intestines or in the stomach or there may be risk of perforation or bleed. And in those situations, surgery serves to both relieve the --- the symptoms which could be catastrophic for the patient, but also can lead us to very s --- more specific diagno --- diagnostic tissue acquisition. There are also patients with primary brain lymphomas for whom the first step for diagnosis may be the resection of a localized brain lesion. There may also be an indication for resection of masses in the spinal cord for decompression of pressure on the cord in selected cases, although it is not as a general rule the first therapeutic modality for spinal cord lesions. But nonetheless there may be cases where this is the indicated approach.

Now radiotherapy has a role in the treatment of lymphomas as well as multiple myeloma. Although less frequently used as a single curative strategy, it does have a significant role in consolidation or adjuvant modality therapy. For example, in patients with very bulky lymphoid masses as well as in patients with brain and spine lesions
where radiation can play a significant role both in de
decompression or relieving symptoms of acute compression and as well as consolidating responses to chemotherapy. For patients with indolent lymphomas, localized nodal or localized extranodal lesions may be treated as a frontline modality with radiation. It depends again on the subcategory of the lymphoma and it is largely mostly applicable in the indolent lymphomas. In multiple myeloma radiation is the preferred treatment modality for localized plasmacytomas. And it also has a very important role in treating bone lesions that are painful or threatening fracture and in addition to spine lesions that again may threaten spinal cord stability.

Now the more common treatment approach actually is systemic therapy. And I will speak first about chemotherapy because this is the most widely and most commonly used therapeutic modality. In patients with acute myeloid leukemia disorders, predominantly we use high doses of chemotherapy and a common category of chemotherapeutic agents are the DNA analogues. These treatments, because of their intensity, therefore, have significant acute morbidity and potential mortality depending on the patient’s age and other risk factors. However, as you saw in our survival curves, this strategy of intensive treatment has led to progressive improvement in the survival outcomes of patients. For aggressive lymphomas as well as acute lymphoid leukemias, again high dose chemotherapy is the preferred frontline modality and a very important category of drugs. And the most commonly used regimens for these disorders are the alkylators. Typically cyclophosphamide or a phosphamide as well as anthracyclines of which doxorubicin is the most common prototype of --- of drug; steroids which again may include prednisone or dexamethasone as the most commonly used subcategories of steroids; vinca alkaloids of which vincristine is again the most commonly used agent; and topoisomerase inhibitor drugs of which etoposide is the prototype most commonly used. Antimetabolites, such as methotrexate and cytarabine, form part of certain subtypes of regimens. And heavy metal analogues like cis-platinum and carboplatinum as well as proteasome inhibitors li --- such as bortezomib are now more commonly being integrated in the salvage strategies for recurrence of aggressive lymphoid disorders.

In contrast, as I noted for the indolent B-cell lymphomas and chronic lymphocytic leukemias, frontline treatment is shifting increasingly towards immune therapeutic strategies. And now at this time more commonly to agents that are considered to be targeted in their therapeutic intent. Of the immune therapies, the monoclonal antibodies of which rituximab is a very commonly used agent can be given as single agent or it may be combined with other chemotherapeutic drugs. Presently, for example in frontline regimens for indolent B-cell disorders, bendamustine in combination with rituxan is a recommended treatment strategy. For recurrent disease, we may escalate and change treatment approaches to more intensive and different subtypes of drugs. The purine analogues, for example of --- for example fludarabine and cladarabine are very effective in the treatment of B-cell disorders. But they do have potential subsequent toxicities and therefore ca --- mu --- must be used in --- in very considered strategies. I noted that we now are shifting increasingly to using new therapeutic agents. The tyrosine kinase inhibitors, for example, ibrutinib are coming into the picture
as first line salvage drugs and are now being tested actually in frontline treatment protocols. So the future for the treatment of indolent B-cell disorders as well as chronic lymphocytic leukemia is --- is a moving target, if you will. We are progressively introducing newer and newer agents and, therefore, the future treatment strategies we predict will continue to change. In chronic myeloid leukemia the tyrosine kinase inhibitors are again very critical and have been shown for sometime now to have very significant efficacy and long-term survival benefit. And again, imatinib is one of the prototype drugs mos --- most frequently used. For multiple myeloma, steroids, alkylators, and proteasome inhibitors are commonly used agents in the frontline setting. And the more commonly used proteasome inhibitors are bortezomib and lenalidomide. Again, in multiple myeloma the strategies for treatment are continuing to evolve. And in young patients with multiple myeloma, stem cell transplantation has an important role as well.

So speaking of stem cell transplantation, there are two major sub --- sub categories of stem cell transplant approaches. One is the so called autologous stem cell transplant in which the infused stem cells are derived from the patient themselves versus allogenic in which the cells that are transplanted or infused arise --- arise from a donor. And the origin of the donor cells could be related. That is from a sibling or a related individual or unrelated. The unrelated donor stem cell transplants are increasingly more frequent. These stem cell donations could be fully matched by HLA antigen matches or maybe partially matched. And again the field of stem cell transplantation for un --- or partially matched HLA antigen donor cells is again moving towards increasing strategies for improvement of gras --- graft versus host reactions which is making it possible for the transplant specialist to in --- in --- to use even further less matched donor stem cells. There are also donor lymphocyte infusions or DLIs and cord blood donor cells. Each of these, of course, has its own profile of toxicity --- anticipated toxicity or late effects as well as time to recovery and potential late effects on the recipient.

Then there is a --- Looking a little a bit more closely at the subcategory of immunotherapies, I've already mentioned the monoclonal antibodies. And monoclonal antibodies are obviously targeted protein molecules which are directed against very specific antigenic expressions on the surface of the tumor cell. Because these antibodies are complex, they can be either unconjugated, meaning their --- th --- the antibody in itself is the therapeutic agent. Or it could be combined or conjugated with another molecule that could have an antitumor effect. That is, conjugated with a toxic drug element or conjugated with a radioactive isotope. The antibodies that are conjugated with a radioactive isotope are --- we call the hot antibodies can also have different sources of energy. And the two most common currently commercially approved by the FDA are yttrium-90 conjugated antibody and iodine-131 conjugated antibodies, both targeted against CD 20. Of the cold monoclonal antibodies, we have a spectrum some of which are targeted against the CD 20 marker on the B-cells. And newer antibodies more recently approved by the FDA that are targeted against markers in Hodgkin and anaplastic lymphomas against the CD 30 antigen marker on the cells and a well-known pan-antibody against CD 56, alemtuzumab, which targets lymphocytes in general.
Now some of the common concerns that we the treating oncologists face when determining appropriate treatment strategies include the age of the patient, which in itself can be a risk factor, since some of these treatments as I noted can be quite intensive. The tolerance for these treatments is certainly decreased in older individuals as well as those with comorbid conditions that may make them more fragile. Recovery time also is lower in older individuals so that has to be taken into consideration. The treatment can worsen or exacerbate underlying health problems. Diabetes, in particular, is an issue when we are treating patients that require regimens that include steroids. Cardiovascular disease can be exacerbated by the anthracycline agents, doxorubicin for example. And certain underlying viri --- viral infections --- infectious illnesses which can be, in fact, an underlying etiologic condition for lymphoid disorders, such as HIV and hepatitis B and C, the --- the active presence of the virus also affects significantly the potential choices of drugs as well as the potential downstream toxicities of the drugs. The presence of hepatitis B virus, for example, is a contraindication to the use of monoclonal antibodies targeting against CD 20, for example, rituximab. For all of these patients, there may also be an increased risk of second malignancies. In patients with chronic lymphocytic leukemia, there are multiple malignancies that are known to occur later in the course of the patient’s survival. Hodgkin lymphoma can likewise have an increased incidence of multiple malignancies in the survivors and mantle cell lymphomas for unclear reasons seem to have a risk of renal cell carcinomas.

So speaking of late effects related to these various modalities, for patients who have been treated with surgery, of course, the late effects will be related to the site of the surgery. It must be kept in mind as the patients can live, like I said, a long time and we must be mindful of these late effects. The gastrointestinal --- Patients who have gastrointestinal resections to relieve obstruction, for example, or to relieve perforation by lymphomas can have late effects of bowel adhesions as well as potential nutritional deficiencies and malabsorption disorders that lead to chronic anemias. Patients who have had primary brain lymphomas if they had undergone a surgical resection at the primary site of the tumor may have cognitive and/or motor deficits related to that surgical intervention and possible chronic seizure disorders. Patients who had splenectomies related to their primary splenic lymphomas will be susceptible to encapsulated bacterial infections. And, therefore, consideration to their needs for vaccinations preempting the splenectomy --- prior to the splenectomy and then post-splenectomy with maintenance of booster immunity should be kept in mind.

Again, radiation also has localized late effects for patients who have had radiation to the head and neck region. Hypothyroidism can be a late effect and may not manifest acutely immediately after radiation but may take several years to develop. Patients who have had mediastinal radiation will be at risk for pulmonary fibrosis. But most importantly we should be mindful again of the risk of patients downstream for lung and breast cancers, particularly for young women who have been treated for primary mediastinal lymphomas, for example. Patients who have had radiation to lymph node sites in abdominal fields, bowel adhesions as well as potential nutrient ---
malabsorptions similar to surgery should be kept in mind. Patients who have undergone brain radiation again cognitive deficits are described --- are well known and particularly will have a higher incidence in individuals who are older than 50 at the time of radiation. For mediastinal and chest radiation, in addition to the incidence of potential second late malignancies, we must be also aware that if the radiation port was near the heart, there could be accelerated coronary artery disease, valvular stenosis, and conduction deficits downstream. Radiation to the pelvis and spine can accelerate bone loss as well as in patients who are young, risks of infertility and aseptic necrosis of the femoral head, in particular for patients who have had the joint space in the radiation fields or near the radiation fields.

Chemotherapy has numerous potential effects, again, depending on the family and subtype of chemotherapeutic agent. General complaints of patients after chemotherapy are chronic fatigue and the so-called chemobrain syndrome. That is that there is slowing down of the processes of cognition. It is not necessarily a dementia syndrome, simply a --- an impairment in the patient’s agility with certain cognitive functions. There are certain subtypes of drugs that have well known and described potential late effects. For example, bleomycin which is a drug, that is part of the frontline regimens to treat Hodgkin lymphoma, will have decreased lung diffusing capacity risk. And, therefore, these patients must be monitored before treatment and after treatment to assess whether there has been a decline in lung capacity. Anthracyclines and the tyrosine kinase inhibitors can have potential late effects of cardiomyopathy as well as accelerated coronary artery disease. Heavy metal agents, such as a --- a --- a carboplatinum and cis-platinum as well as the alkylator iophosphamide, can have late effects in renal function. In particular, there can be electrolyte wasting syndromes, magnesium, for example that can persist for many years. And, therefore, the patients must be aware of this. And if the patients have chronic deficiency they must take nutritional supplements to overcome that waste. There are several categories of drugs that can accelerate menopause or infertility. The most commonly described of these agents are the alkylators. But, in fact, this can be an unfortunate late effect of --- of several subtypes of dr --- of chemotherapeutic agents. The vinca alkaloids as well as the proteasome inhibitors and the taxanes can have late effects of neuropathy. And again, these are most pronounced in individuals who are older, who have peripheral vascular disease, and diabetics. Steroids and chemotherapeutic agents in general can accelerate bone loss. So counseling patients about their bone health, vitamin D, --- checking vitamin D levels and supplementing ap --- appropriately is important. And for alkylators and topoisomerase inhibitors, which are very commonly used in the various regimens to treat lymphoid disorders, bone marrow insufficiency as well as myelodyplasias and secondary leukemias can be late effects.

Stem cell transplantations or cellular therapies can have, in addition, their own unique side effects. In addition to all the other effects of chemotherapy, please remember that most patients who undergo either an autologous or an allogenic stem cell transplant procedure will already at some point have had some form of modality of treatment, either chemotherapy or chemoradiation combined. Therefore, in addition to all of those problems related to those prior treatments there a can be additive consequences from
the transplant itself. For example, after autologous stem cell transplantation, we must be mindful that patients may be at risk for --- or an increased risk of second malignancies as well as suffer from latent immune deficiencies and attention to adult vaccination booster recommendations is important. For patients with allogeneic stem cell transplantation, there are a host of immune related problems that can potentially arise. Patients may suffer from a chronic bronchialveolar inflammatory process called BOOP. They may also have grass --- graft versus host disease effects such as skin ras --- rashes, changes in the pigment of their skin which can be im --- very important from the pat --- from the perspective of self-image and body image disorders. The patients may also have other chronic vital organ dysfunctions. For example, chronic inflammatory liver and bowel disorders, eye dryness which can lead to or accelerate the onset of cataracts and vision changes as well as oral dryness that can impair their ability to enjoy certain types of food. Immune deficiencies and immune disorders will render these patients unfortunately more susceptible to recurrent infections as well. So therefore advising patients about lifestyles that prevent infection and mindfulness to vaccinations is important.

And lastly, related to immunotherapies although these are newer agents, we are beginning to see some possible late effects of pulmonary toxicity or neuropathies from some of these agents. From the radio-immuno conjugated agents, for example I131 could lead to hypothyroidism as a late effect. But also secondary malignancies such as thyroid cancer as well as bone marrow insufficiency and latent myelodysplasias can be seen. The cold monoclonal antibodies may render patients immune deficient for a number of months to years and, therefore again. being mindful of their suscepti --- patient's potential susceptibility to respiratory infections and reactivation of certain viral infections should be kept in mind.

So if I were to describe then what patients might anticipate as late effect of treatments, we have what I call the stacked or additive effects. For single treatments, of course age and illness can be additive agents or additive factors to late effects. But these keep getting more pronounced the more treatments the patients receive. For combined modality treatment, that is radiation and chemotherapy, obviously we might anticipate even greater effects than from either of these two treatment single modalities. For patient who have recurrently and repeated cycles of treatment, such as patients with chronic and indolent lymphomas, those repeated cycles of treatment will over time also have additive effects. And for patients who in addition to multiple treatments have stem cell transplantation that again will only make the late effects --- the possibility of late effects even more pronounced.

I've been focusing largely on physical concerns or issues that patients may face later in --- in their survival after treatment for ly --- hematologic malignancies. But I want to briefly touch on other issues. There are a number of other psychosocial problems that can occur --- or that patients face after their survival from the treatment of their hematologic malignancy. And these range from psychological issues to sexual health problems, fertility, and very real economic and abilities to sustain a productive and meaningful life and employment after their treatment.
So in the psychological health realm, anxiety and fear over relapse is a common symptom in patients as well as depression and grief over the loss of health as well as over loss of lifestyle or work; or even their body image in the case of patients who may have significant changes in how they look particularly those that suffer graft versus host disease. There are also in many situations unfortunately disrupted relationships because the burdens of the illness as well as the burdens that the continued, and in some cases, repeated relapses of the illness can place on the family and on a --- a --- spousal relationships.

Patients often complain of fatigue as I --- as I noted and this can be an impairment to their returning to their usual normal life activities. Although it seems paradoxical, but actually patients who suffer chronic fatigue should be encouraged to slowly integrate back into a regimen of exercise, as exercise is one of the likely most effective therapeutic strategies to combat the fatigue. Immune --- Impaired immunity is --- is a consideration for those who love to travel. And they should be advised to pay close attention to advisories by the CDC as to the safety of traveling to certain regions of the planet. In all cases, a gradual integration to normal prior level of activity is recommended both for physical as well as psychological well being.

Many patients complain of decreased libido particularly after they’ve undergone intensive chemotherapy. We should consider that this might be due to sex --- decrease in the sex hormone levels. And this is true both for men and women. It is not simply an effect on --- on --- on women. And in addition we also should consider checking thyroid function because many patients may have subtle thyroid deficiencies that can impair their --- their --- their energy and --- which can then also, of course, influence their sexual interest and physical stamina. Menopause symptoms that are uncomfortable should be addressed. And in general for particularly women who undergo aggressive chemotherapy and/or stem cell transplantation during their years prior to what would have been a normal onset of menopause, considering hormone replacement is an im --- is important. And in addition, of course, addressing the psychological factors of anxiety and fear, depression, and body image, all of which influence libido.

For young patients, again, fertility will be a significant concern. Hopefully strategies to preserve fertility would have been addressed prior to treatment. But the reality is that often there is no time to really consider this issue. That is, there isn’t enough time to perhaps generate fertile embryos or to --- or --- to generate embryos or to generate ova for storage or to store sperm. If that has been the case, then after treatment it is still important to address fertility concerns with the patients. For male patients, they should have their sperm counts checked if they are interested in the issue of fertility. They should have their sperm counts checked no sooner than six months after treatment and probably ideally at least a year later. Sperm counts do recover in --- in many young men, but there may be issues with motility and all of that needs to be evaluated. Return of menses for fem --- young female patients may not necessarily always relate to preservation of fertility. And therefore if --- in couples that are attempting to have
children if they have had difficulty achieving pregnancy, we recommend that they consult a fertility expert.

There are also very important and pragmatic concerns that relate to health and life insurance. The median age of patients with lymphomas and leukemias is in the 50s. Therefore, many patients fortunately will have had Medicare coverage, but for a significant number who are in their productive life years, there could be problems with their securing both life and health insurance. A study in 10 year hematopoietic stem cell transplantation survivors indicated that at least a 4th of them had experienced denial of both health and life insurance compared to age matched cohorts which reported no significant proportion of denials. Of course the Affordable Health Care Act is changing the access to health insurance. But there are --- the issues of life insurance and other economic safety measures are not necessarily there. Those with health insurance, in addition, have much higher premiums and lesser benefits which made their access to health care for late effects difficult or in some cases unaffordable. This has been confirmed. This finding has been confirmed by our --- by a very recent report from the CDC that showed that both men and women who had survived treatment of cancer are spending several thousand dollars more than age and gender matched cohorts in the general population. So this is not a trivial issue in terms of the economic health of families and individuals who have survived cancer treatment.

So returning to work is yet another important issue. Factors that have been associated with successful return to work in cohorts of stem cell transplant survivors, for example, are a younger age as well as higher --- and by younger age we mean less than 50, higher education level meaning college degree or higher, and employment prior to the stem cell transplant. These were very favorably related to successful return to work. So this means that there are [a] subset of individuals that may never be able to return back to work. 84% of those again who had not had a relapse after their primary malignancy were employed at least five years out after their stem cell transplant.

So “how would we then coordinate or organize a plan of care for cancer or hematologic malignancy survivors?” Well we need to take into account first of all their --- the issues of health and secondly the issues of coordination of their care with the many providers that often are involved in the care of cancer survivors. Our algorithms of care should include both elements of surveillance for the primary malignancy as well as surveillance for second malignancies; monitoring for late effects of all of these variety of treatments; and understanding the late effects of treatments; cancer prevention and screening as well as addressing psychosocial health concerns. To facilitate the communication about --- among the providers we recommend some form of documentation. We use a tool at MD Anderson that we call the Passport for Health.

This is an example of our algorithms. This is the algorithm for survivorship care that we designed for patients with diffuse large B-cell lymphomas who are in what we call the long-term survivor phase of health care. Patients are considered to be long-term survivors five years after their diagnosis in remission of the lymphoma. The patient should be free of re --- evidence of recurrence. And at the time of their transition then
we specifically design a care plan that will focus on --- that will address the surveillance for malignancy and other comorbid disorders; monitoring for the late effects and these can be numerous as we’ve discussed; as well as risk of --- or risk prevention or ameliorating the risk of late or secondary malignancies by appropriate screening guidelines; and psychosocial functioning monitoring. If at any time we unfortunately do find the patients have developed a second primary malignancy or an unexpected very late recurrence of their primary malignancy, the patients are then transitioned back to their oncologist.

The Passport Plan for Health has two components. The one --- on one page is a summary of the treatment the patients have received with a description of the anticipated and/or already active late effects from that treatment. On the second page is a summary of the recommended health care strategies for monitoring --- for surveillance monitoring, for late effects monitoring, and general health maintenance.

In summary then, hematologic malignancies are more common in older adults. And therefore, as the median age of our population is rising, so will the number of patients who will present to us with these disorders. The number of survivors from hematologic disorders is thus predicted to increase. Again, both due to the increase in the number of cases, but also due to the fact that as we are developing new therapies we are continuing to improve survival outcomes as you saw in our survival graphs.

The treatments for hematologic malignancies can be very variable and it --- they depend on the presentation of the illness, on the specificity of the --- of the clinical manifestations of the illness whether it’s chronic versus a --- aggressive and acute, or if it is recurrent. Understanding the appropriate treatment modalities for each of these phases as well as their potential unique as well as additive late effects is important for the health management of these disorders. And because some of these patients may have chronic malignant manifestations, there will be a subset of the hematology survivors who are living with their disease in perhaps a smoldering phase or in a remission phase but with an unfortunate anticipated later recurrence. Therefore, to manage well the survivor population of hematologic malignancies, we must understand both the malignancies themselves as well as the effects of the treatments. This concludes my presentation. I want to thank you for your attention. I also want to invite your feedback. We want to continually improve the content and relevance of our educational materials. Please let us know if you found this beneficial or what else you would like us to address in our presentations. Thank you again.