

Legends and Legacies Book Chapters

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Ritsuko Komaki, M.D.



**Professor of Radiation Oncology
The Gloria Lupton Tennison Distinguished
Professorship in Lung Cancer**



Ritsuko's father Isao Yeda and mother Ykeiko Yeda are shown at home in a suburb of Hiroshima City, Japan, in 1963.



As a medical student at Hiroshima University, Ritsuko (front row, third from left) went with other students to visit basic science departments.



Husband Jim Cox, M.D., was on hand in 2006 when Ritsuko received the award of The Society in Tribute to Marie Skłodowska-Curie in Warsaw, Poland.



My decision to become a cancer researcher and physician was triggered by events early in my life. When Ms. Sadako Sasaki, one of my elementary school friends in Hiroshima, died of acute granulocytic leukemia at the age of 11 after having been exposed to atomic bomb radiation in infancy, I knew that I wanted to be a leukemia researcher or physician so that in the future I would be able to help those with illnesses like hers. Today, I am a professor of radiation oncology at M. D. Anderson Cancer Center and treat patients with thoracic malignancies. My interests include clinical trials, multidisciplinary treatment, normal tissue toxicities and translational research.

Growing up, my role model was Marie Sklodowska-Curie, a respected scientist and the first woman to receive two Nobel prizes: one (together with her husband Pierre) for Physics in 1903, based on their work on natural radioactivity, earlier discovered by Antoine Henri Becquerel, with whom they shared that prize; and the second for Chemistry in 1911, based on the identification and production of metallic radium and the description of the transmutation of one element into another. I find Madame Curie's story inspiring and have read her biography so many times that I know part of her life story from memory. She was a scientist, a wife and the mother of two daughters. Her husband Pierre, who shared his work (and the Nobel Prize in Physics) with his wife, had died in an accident when their daughters were still young. In 1904, Pierre had been given a chair in the School of Physics at the Sorbonne and promised a new laboratory. The laboratory was not forthcoming, however. Then, tragedy struck on April 19, 1906, on a rainy Paris street when Pierre was run over and killed by a horse-drawn carriage while walking from his laboratory.

Marie Curie's background in Poland, where she grew up, was fascinating to me. During the Russian occupation of Poland, Polish children were forced to read their textbooks in Russian in front of Russian soldiers who came to the schools to observe the students' performance under Russian rule. Marie was usually picked by her teachers to read textbooks in Russian since she was the best student in her class and her school. I am certain that her desire to be free from this oppressive environment and her enthusiasm to expand her scientific knowledge motivated her to escape from Poland to France in order to successfully continue her education and become a leader in the scientific community.

Her older sister was already in Paris to study, and this no doubt helped Marie follow in her sister's footsteps. Since Marie's father was a teacher, she had always had an interest in education. I was fascinated reading about her persistence as she discovered polonium while seeking the cause of radioactivity in large amounts of pitchblende ore. Even after her husband's

sudden and unexpected death, her passion to investigate radioactivity based on the theory she and Pierre had developed never weakened, and her persistence to forge ahead was never destroyed.

During my childhood in Hiroshima, I had heard many terrible stories of deaths related to radiation from the atomic bomb; these deaths were due to the acute or late effects of the radiation, which included malignancies, psychological depression and suicides. I began to think about who had been responsible for the discovery of radioactivity and radium, about how it originally had been intended for use to alleviate suffering in humans, and about how radiation affects humans. It is ironic that the discovery of radioactive material eventually killed Marie Curie but even more ironic that her persistence to achieve her scientific goals combined with my friend Sadako's death from radiation exposure inspired me to devote my life to becoming a scientist, clinician and educator.

As I was growing up, my parents and their experiences had a great influence on my development and career. My father, Mr. Isao Ueda, was the youngest of 12 children of the family who owned the Sake Brewery on one of the small islands near Hiroshima. My grandfather had died when my father was 10 years old, and his oldest brother had assumed leadership of the family business. When a severe typhoon hit the inland sea, the family-owned ship carrying Sake barrels sunk and left the business and the family bankrupt and without any insurance coverage. Thus, at the age of 13, my father had to go to work delivering Sake bottles for his oldest brother's new small liquor store in Hiroshima so that he could stay in his brother's house. My father decided to get a scholarship to the Hiroshima University School of Education, but this meant that he had to commit to teaching children ages 7 to 12 in a small village for four years after completing his education. The period in that tiny village was the most boring time of his life and he developed a peptic ulcer, but he was nevertheless able to save his money and then pass the entrance examination for admission to Kyoto University, where he majored in economics.

After graduating from Kyoto University, he married my mother in an arranged marriage, went to work in Osaka, a city approximately 250 miles east and north of Hiroshima and the second largest city in Japan (after Tokyo), and began working for Hanshin, one of the most prestigious companies. Then, at 8:15 a.m. on August 6, 1945, the atomic bomb was dropped on Hiroshima. The following day, my father walked into Hiroshima and was exposed to "black rain" containing a high dose of radiation. He lost many members of his family who were exposed to high levels of radiation from the bomb, although some family members exposed to the radiation managed to survive. My father decided to move back to Hiroshima to help his and my mother's families and took a job in the Hiroshima Bank. I recall

that every time he was promoted to chief of a different branch of the bank, we had to move to a different city. I had to change school four times while still in elementary school, although I never complained. When we moved to Matsuyama, a small city on Shikoku Island, my teacher there always asked me to read aloud from the textbook in our class. My classmates laughed at me because of my Hiroshima accent, and this made me furious.

My father was always busy and often came home around 2 a.m. As a banker, he had to entertain his customers after 6 p.m. every night. I never saw him other than on Sunday; I always missed him and was puzzled by the Japanese work system. He was the leader of the union and eventually retired at age 55 when he was not promoted to executive member in the Hiroshima Bank. By virtue of his education, he should have been one of the executives, but the other executive members feared his idealism and higher education than theirs. He eventually died of disseminated bladder cancer at age 72, possibly due to his exposure to the atomic bomb radiation and to his tobacco smoking. He smoked one to two packs a day of Peace for at least 40 years. I always feared that he might develop lung cancer, but instead, he developed diabetes, bladder cancer and peripheral vascular disease. My father was a very hard-working man, but he was so disappointed by his first child's (and only son's) incurable illness that it caused him to be very distant from his three daughters, of which I was the middle daughter. Because of my father's remoteness, I always felt that his daughters did not mean much to him, and I wished that I had been born a boy so that I could have fulfilled his desire for a son.

My mother, whose maiden name was Yukiko Obata, was the oldest daughter of a samurai family. Her father (my maternal grandfather, Mr. Kanbei Obata) had graduated from Tokyo University and had once served as a chief officer of the Ministry of Agriculture in Japan. After his retirement, my grandfather had served as a secretary to Mr. Asano, lord of the Hiroshima prefecture. My grandparents had a huge samurai house with several maids and secretaries to serve them. My mother was raised by a babysitter, as my grandmother was too busy visiting temples and shrines to care for her. My grandmother was my grandfather's second wife, after he had lost his first wife to tuberculosis. He had decided to marry my grandmother because she was the strongest woman in town. A striking woman, my grandmother was 6 feet tall, with red hair and fair skin, and everyone said that she had one-eighth Russian blood. Men found her imposing height intimidating, and she had not previously found a husband because men considered her "too tall to marry." For many men, marrying a small cute and very obedient wife was one of the most important marriage criteria in Japan. My mother was extremely proud of her samurai family background (on my grandfather's side) and blamed her marriage to a lower-class person (my father) on the

first world war. She spoke about her grandmother, “Chika,” who was for her the most elegant and caring person. My mother truly loved me and would demonstrate her affection, for example, by hugging me when I got a good grade in school. I never received such affection from my father or anyone else. By the age of 7, my mother had read almost all of the books in her father’s library. Because of his position as secretary of a Lord, he had many books on European and Asian history, and my mother read and memorized all of them.

In later years, when my husband and I took my mother to France and Vienna, she was our guide for information on the European royal family trees. She read many Chinese and Russian history books and all 12 volumes of Pearl Buck’s “Big Earth” about China. However, her incredible knowledge of world history did not help to support family members when the atomic bomb destroyed everything. Thus, she wanted her three daughters to become capable women who could support the family in case anything should happen to their spouses. My mother had great pride but was always extremely kind to those less fortunate. She told me to give my extra pencils and notebooks to some of my classmates who were orphaned after the atomic bomb or to those whose fathers had died in the war. For her entire life, my mother loved to cook for us and to compose Haiku (Japanese poems). After my father died and she traveled with us, her knowledge about the histories of Japan and European countries and her ability to compose beautiful Haiku amazed us and others wherever we went. My mother died of stomach cancer at the age of 80. I still miss her very much.

I was born in Amagasaki, a city in the Hyogo prefecture between Osaka and Kobe, while my father, Mr. Isao Ueda, was working in Osaka. I was my parents’ third child. My family decided to move back to Hiroshima when I was 4 years old, since they had originally come from that city and since they had to return there to help family members who had survived the bombing. However, after we moved back to Hiroshima, we had to move again many times due to the lack of housing and to my father’s promotions in the Hiroshima Bank. I had to change elementary schools four times within six years.

I met my friend Sadako Sasaki in the Nobori-Cho Elementary School when I was 10 years old and in the fifth grade. We were the same age but in different classes in order to compete in running events in the fall athletic meeting. Sadako was very fast, and I had a tough time racing against her. At the age of 2, Sadako had been exposed to radiation from the atomic bomb. She eventually developed shortness of breath due to anemia and was diagnosed with leukemia. She was hospitalized and died of leukemia nine months after her diagnosis. Before she became ill, she had registered to attend Nobori-Cho Junior High School; sadly, she never was able to do

that. While Sadako was hospitalized, she attempted to fold 1,000 origami cranes. In Japan, the crane is a symbol of longevity and happiness. It is said that if you can fold 1,000 cranes, you can recover from your illness. After Sadako took her medication, she folded her origami cranes from the wax paper that had wrapped her medication. Sadako wanted to live! However, despite our prayers and our helping her fold her cranes, she passed away. Two years after her death, I became president of the junior high school that she had registered to enter but never gotten to attend. When she died, all the children in the school expressed their sorrow to her brothers and parents.

When I became president of Nobori-Cho Junior High School, I began to communicate more often with Sadako's older brother. He and I started to initiate plans for a memorial statue for her. We decided to go on the streets and gather donations from Hiroshima's citizens, and we also wrote many letters to deans of schools in Japan asking for funding contributions for her memorial. We also engaged a young gentleman, Mr. Kawamoto, to help us get a public educational film-making group to create "Sadako's Story," which became a hit film titled "One Thousand Cranes" and was shown in many movie theaters. Within two years, we had collected enough funding to hire an architect to create an "atomic bomb children's statue" in the center of the Peace Memorial Park in Hiroshima on the site of the hypo-center where the bomb had been dropped.

Sadako's death had a very profound influence on me. Although I was very sad, I also realized that I now had a mission: to make sure that Sadako's death would not be forgotten and to send a message to younger generations that destructive wars that destroy so many lives should never be allowed to happen again. Also, I was very curious about the effects of atomic bomb radiation, since my grandmother had been in Hiroshima when the bomb was dropped. In fact, her house had collapsed due to the suction effects from the bomb. She was trapped underneath her house but was rescued from the ruins and taken outside of the city. In the few months that followed, she experienced every side effect of total-body radiation (e.g., hair loss, severe diarrhea, anorexia and bone marrow suppression). However, she recovered from these effects and lived an almost normal life without developing leukemia or any malignancy. My grandmother died of severe senile dementia and osteoporosis at the age of 72. I was always puzzled by why she did not develop leukemia as Sadako had. Now I have a much better understanding of this, as I have learned about the higher susceptibility to carcinogens in the dividing cells of younger individuals.

I decided to attend medical school, but my parents wanted me to stay in Hiroshima, since it would take six years to graduate and they did not want me separated from them for that long. Thus, I entered Hiroshima University School of Medicine. While I was a medical student, I volunteered

during summer vacations to perform physical examinations of people who had been exposed to atomic bomb radiation at the Atomic Bomb Casualty Commission (ABCC), now called the Radiation Effect Research Foundation (RERF). While working at the RERF, I met Dr. Awa, one of the world's leading experts on the chromosome abnormality caused by radiation, and became very interested in hematology and chromosome abnormalities. I also met Dr. Bloom, a hematologist, Dr. Bell, a thyroid specialist, and Dr. Robert, a cardiologist who was checking cardiac effects in humans exposed to atomic bomb radiation. At the RERF in Hiroshima, I had a wonderful opportunity to meet with great scientists and clinicians who were interested in radiation effects on humans.

Then, when I graduated from Hiroshima University School of Medicine, all the interns and medical students at our Hiroshima University Hospital as well as all other university hospitals decided to go on strike. We were protesting to have the government pay for the internships and improve the medical system and the medical school curricula at the University Hospitals. We had to go outside the University Hospitals to get postgraduate education by ourselves. I went back to the RERF in Hiroshima and worked for a year, during which time I married Dr. Senichiro Komaki, a diagnostic radiologist from Kyushu University working at the RERF. We came to the United States to continue our postgraduate education at the Medical College of Wisconsin (MCW) in Milwaukee. By order of his professor, my husband had to go back to Kyushu University, which led to our divorce, since I wanted to continue my residency program in Milwaukee. He subsequently remarried and died of adenocarcinoma of the lung several years ago.

I started my internship at St. Mary's Hospital in Milwaukee, where I met Dr. Guenninger, who had a double specialty: internal medicine and radiation oncology. He was well respected by the surgeons and medical oncologists with whom I was working. I started to think about radiation oncology as a specialty, but because of my original interest in hematology-oncology, I began work at the Wood VA Hospital in Milwaukee as a hematology-oncology fellow. However, the results in patients treated by chemotherapy around that time were not great. Most of the time I had to deal with anemic patients at the VA Hospital. However, when I began seeing some patients whose early laryngeal cancer or Hodgkin disease was cured by radiotherapy, I decided to enter a radiation oncology residency program at MCW in 1974. With my background having come from Hiroshima, radiation oncology was a fascinating area for me.

After I went back to MCW, I focused on a multidisciplinary treatment approach for cancer patients and learned much from the physicians and researchers I met during my residency there: about surgical oncology from Dr. William Donagen; gynecologic oncology from Dr. Richard Mattingly;

pathology from Dr. Lawry Clowry; pediatric oncology from Drs. Larry Kun and Donald Pinkel; lung, head and neck, genitourinary cancer, and lymphoma from Drs. James D. Cox, Roger Byhardt, and Donald Eisert; breast and brachytherapy from J. Frank Wilson; and physics from Dr. Michael Gillin. I was the first and only resident when I started the residency program at MCW under the new department chairman, Dr. James D. Cox. I was well taught by famous radiation oncologists who were all interested in a multidisciplinary approach. When I first came to M. D. Anderson Hospital and Tumor Institute (as it was then called) as an observer for three months in 1980, Dr. Gilbert H. Fletcher was still chairman of the Department of Radiation Oncology.

I wanted to be an expert in gynecologic oncology and came to follow Dr. Fletcher's clinic. His knowledge in head and neck and gynecologic oncology was truly impressive. Again, I met so many great radiation oncologists (Drs. Gilbert Fletcher, David Hussey, Nora Tapley, Eleanor Montague, Lillian Fuller, Luis Delclos, Thomas Berkley, Robert Lindberg, and Rodney Withers) and gynecologic and head and neck oncologists here at M. D. Anderson.

At that time, I never imagined working at such a prestigious institution as M. D. Anderson, but now I have been here almost 20 years. I completed my radiation oncology residency program at MCW in 1979 and then did my fellowship for nine months at MCW and observed for three months at M. D. Anderson in 1980. I stayed at MCW and became an associate professor of radiation oncology. My specialty was gynecologic oncology, and my interests were in predictors of gynecologic malignancies, including histologic grading, ploidy, DNA index, anemia and other factors. At MCW, I taught medical students during summers, and many of them are now professors of radiation oncology there, including Beth Erickson, Colleen Lawton and Chris Shultz. Because of Dr. Eric Hall's reputation working with radiation effects on humans and also because of persistent recruitment by Dr. Chu Chang, one of the kindest physicians we met in New York City, Dr. James D. Cox accepted a position as chairman of the Radiation Oncology department at Columbia Presbyterian Medical Center in 1985. This new department was created 40 years after the last department, Anesthesiology, had been created. Jim and I had married in 1980, and so I tagged along on this new endeavor.

At Columbia Presbyterian Medical Center, I obtained a position as a clinical chief and associate professor of radiation oncology and treated many patients with breast, gynecologic and lung cancers. I introduced conservative surgery followed by radiotherapy for early breast cancer, which was not routine there at that time. Dr. Frank Gump was one of the open-minded breast cancer surgeons there and became very collaborative with Dr. James D. Cox and me.

Jim Cox and I worked hard to make the Radiation Oncology department at Columbia Presbyterian better. We met great people there, but clinical trials and studies were very difficult to conduct. We decided to move to M. D. Anderson Cancer Center when Jim was offered a position there as vice president of patient care and physician-in-chief in 1988. Dr. Lester Peters, the division head of Radiation Oncology at that time, recruited me as a section chief of Thoracic Radiation Oncology and an associate professor of radiation oncology. I have learned so much about radiation oncology here at M. D. Anderson — about radiation pneumonitis from Dr. Elizabeth Travis, radiation time/fractionation of head and neck cancer from Drs. Lester Peters and Kian Ang, and translational research from Dr. Luka Milas.

Highlights in my professional life include becoming president of the Japan-U.S. Cancer Therapy Symposium (JUCTS) in 1999, president of the American Association for Women Radiologists (AAWR) in 2001, and president of the American Radium Society in 2007-2008; receiving a Texas Women Business Award in 2005, the Marie Skłodowska-Curie Award in 2005, and an award from The Society in Tribute to Maria Skłodowska-Curie in Warsaw, Poland, in 2006. I wish that my mother had been with us when I received the Marie Curie Award. She would have been so proud of me and would have hugged me, saying, “*Ri-chan* (my nick name), you have done a great job!”

One more highlight for me, along with Jim Cox and others, was opening the M. D. Anderson Proton Therapy Center in May 2006. Proton treatment has been one of our dreams to reduce side effects to normal tissue, especially in children. After being raised in Hiroshima, I have always felt that radiation is a double-edged sword, as Eric Hall said. If a low dose of radiation is scattered over the body, the incidence of a second malignancy will increase, especially among children or long-term cancer survivors. On the other hand, proton treatment with active scanning to remove neutrons will deliver a very sharp beam edge without scattering the radiation, thus reducing the chance of second malignancies.

In my personal life, a major highlight was my marriage to Jim Cox, who has been my mentor, friend, advisor, supporter and a wonderful husband. My hobbies are traveling, visiting gardens (especially Japanese gardens), and orchid and other flower arrangements. Also, I love to talk to children about my friend Sadako and about how to make origami cranes. And of course, I would like to let them know how terrible nuclear (and any other) war is and why it must be prevented.

There have been many sad memories in my life, including my brother's illness, Sadako's death, my parents' and my patients' deaths due to cancer, and Valerie Cox's death due to an automobile accident when she was 18 years

old. Whenever I faced those tragedies, Marie Curie's words encouraged me. As she said, "Life is not easy for anybody. But what of that? We must have our perseverance and above all, confidence in ourselves. We must believe that we are gifted for something and this must be attained."... "Nothing in life is to be feared. It is only to be understood," and "One never notices what has been done; one can only see what remains to be done."

Finally, I thank all great clinicians, managers, nurses, therapists, physicists, dosimetrists and dietitians who care for patients, and scientists and educators who take care of trainees and fellows at M. D. Anderson. I will continue to learn about science, care for patients, teach others and give messages from Sadako, Marie Curie, my mother and my patients, who all still live in my mind and always will.

