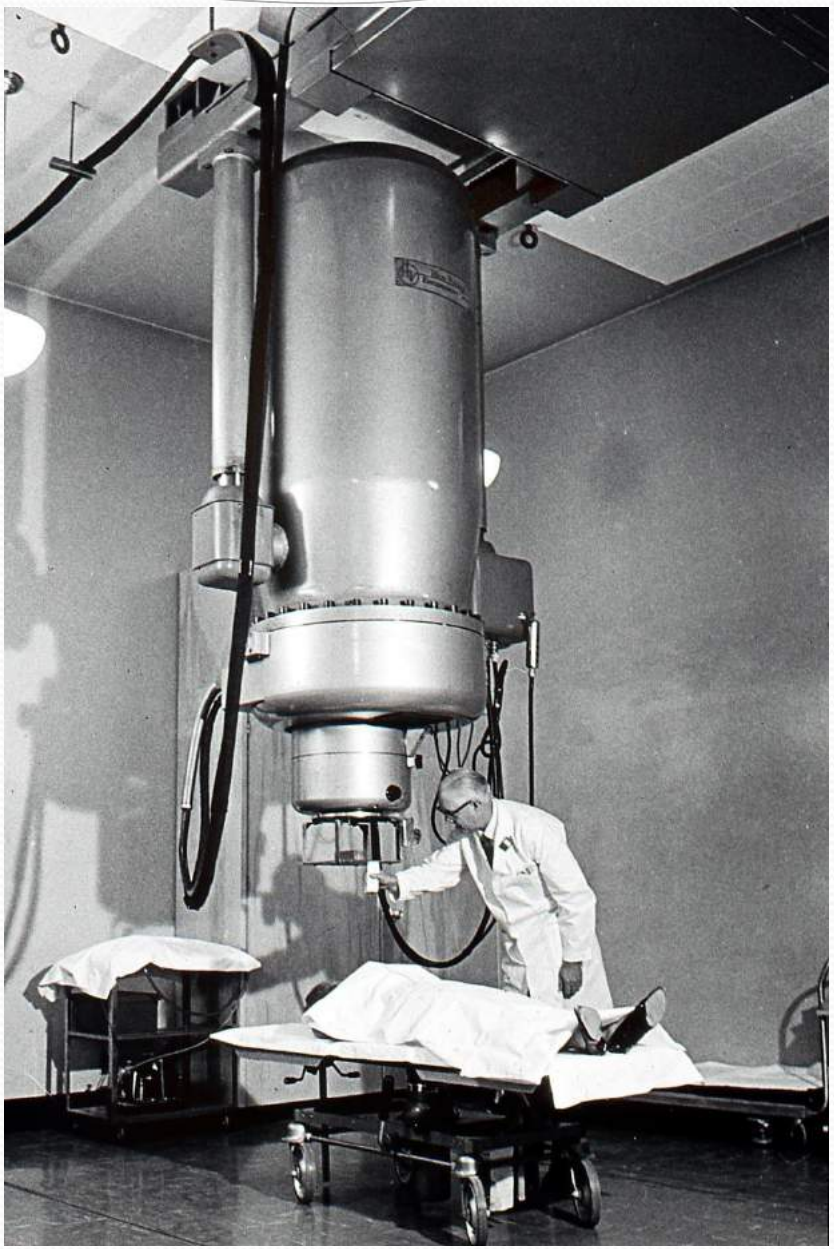
Radiation Oncology in Oregon

Pioneers & Pioneering

Jan. 8 2016 Report

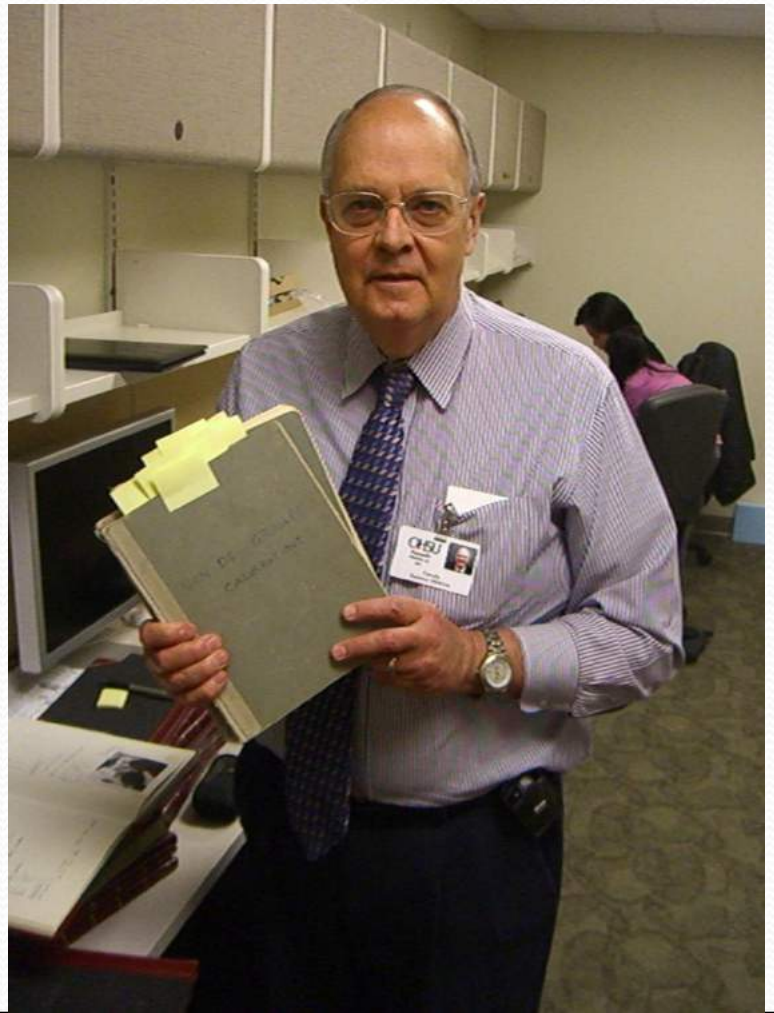
OHSU

History of Medicine Lecture



Kenneth R. Stevens, Jr.

UOMS resident 1967-70, Army MC 1970-72, UOMS interim chair 1972-74, UOMS/OHSU faculty 1972 to present, dept. chair 1989 -2005



First 50 Years 1903 - 1953

- 1895 - Roentgen discovered X-rays
- 1903 - First medical presentations regarding experience with X-rays in Oregon
- 44 M.D. radiologists in Oregon in 1953; only two of them (Milton & Selma Hyman) were full-time radiation therapists.
- Book: Roentgenology in Oregon

  The First Fifty Years - 1903 – 1953

  By Ivan M. Woolley, M.D., F.A.C.R.

  Portland, Oregon, Journal of Commerce, 1955

Rainbow from my OHSU office, Seeing what others do not see

- Some see a rainbow, also the double rainbow.
- Others also see the sky around the rainbow.
- Notice the sky is darker between the bows, and lighter inside the major bow.
- Radiation oncologists are trained to see what others do not see.

Key Factors in Development of Modern Radiation Therapy/Oncology in Oregon

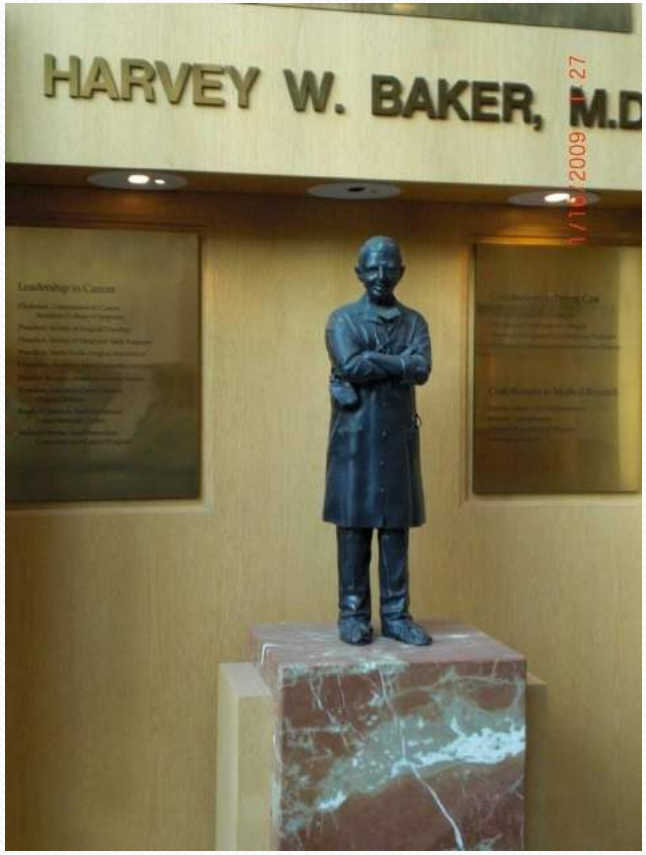
- Physicians fully trained and practicing full-time Radiation Therapy/Oncology. *1943 to 1982*
- Megavoltage treatment machines – treat deep tumors with skin- & bone-sparing. *Cobalt-60 in 1956, first in West, VdG in 1958, Betatron in 1972, Linacs in 1972-present.*
- Improved diagnostic imaging: *CT in 1970s, MRI in 1980s, 3-D imaging in 1990s, PET in 2000s.*
- Improved treatment planning: *Simulators and computerized planning in 1970s, immobilization techniques in 1980s, stereotactic radio-surgery & HDR in 1990s, IMRT – intensity modulated radiation therapy in 2000s.*

Key Factors in Development of Modern Radiation Therapy/Oncology in Oregon

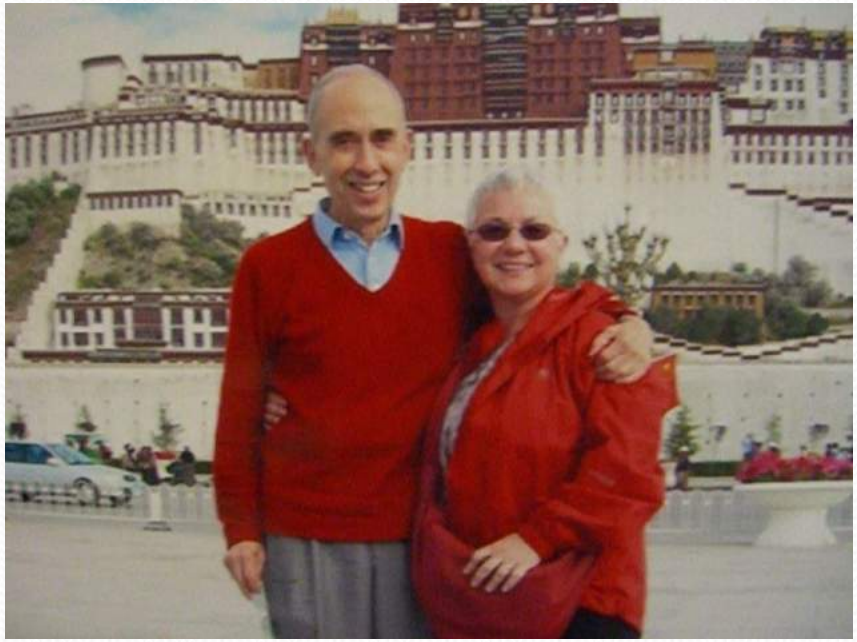
- Multi-specialty tumor boards/conferences; teaching & learning from other specialties for patients' benefit.
- Working closely with other medical specialties: surgeons, pathologists, diagnostic radiologists, medical oncologists, other specialties.
- Developing support staff: technologists/therapists, physicists, dosimetrists, aides, nurses, office staff, administrators, financial/billing.
- Cancer conferences: Tomlin lectures in Medford, Mid-Willamette Conference at Salishan, Teleconferences.
- 1956 - DNA molecule described by Watson & Crick

Examples of Physician Associates:

Harvey Baker
Surgeon



Larry Wolff-
Pediatric Oncology



Understanding the Tolerance of Normal Tissues to Irradiation

- Phillip Rubin, Radiation Effect and Tolerance, Normal Tissue; Frontiers of Radiation Therapy & Oncology, Vol. 6, **1972.**
- Tables of radiation dose that would have probability of 1-5% injury or 25-50% injury.
- Based on survey of experienced doctors.
- Orton & Ellis, A Simplification in the use of the NSD concept in practical radiotherapy; British Journal of Radiology 46:529-537, **1973**.
- Tables of Time, Dose and Fractionation factors for equivalent radiation effect.

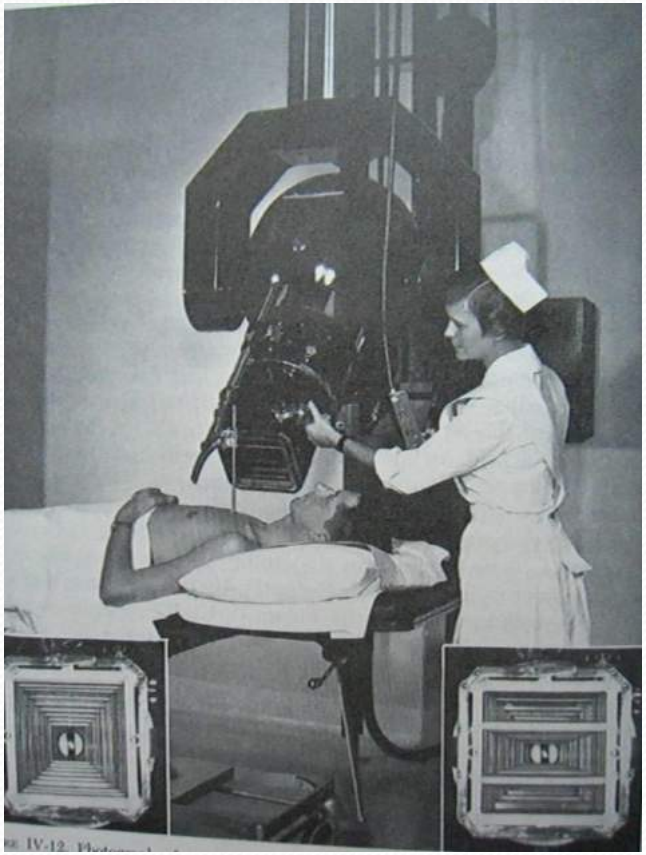
PVAH 1962, orthovoltage irradiation of lymph nodes for testicular cancer – desquamative skin reaction. This severe skin reaction now rarely occurs with megavoltage irradiation

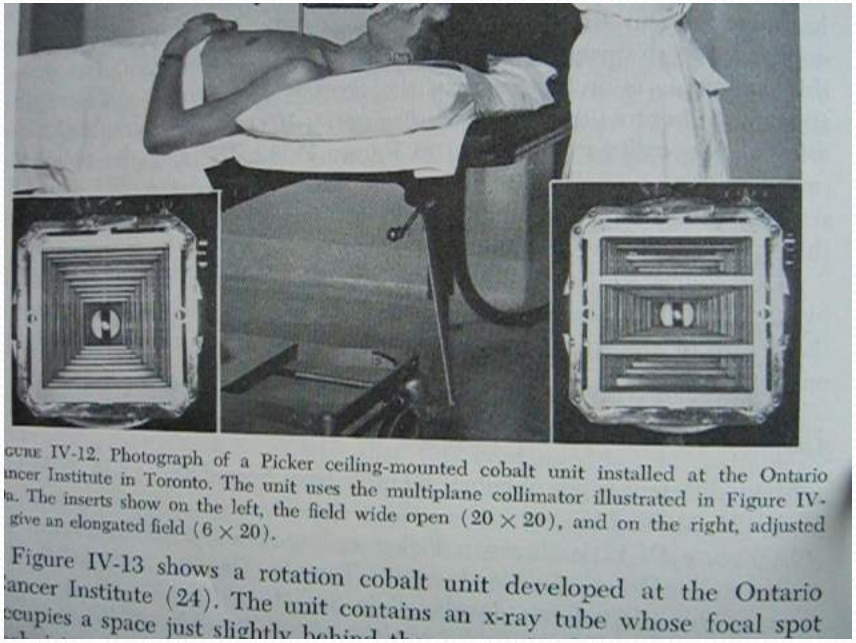
Selma & Milton Hyman – Radiation Pioneers, age 96 & 97, interviewed at home 10/30/2008

- Milton - MD 1937 Long Island Selma - MD 1938 NYU, met at Brooklyn Jewish Hosp, married in 1940.
- Radiation Therapy training 2-3 years from Dr. Maurice Lenz, Montefiore Hospital (Columbia) in New York City. 1942 ABR
- 1943 came to U of Oregon Medical School and VA Hosp. as radiologists, both in therapy and diagnostic.

Hyman, Hyman, Horowitz & Ostlund, private office, NW of Good Sam Hospital at 2311 NW Northrup, Cobalt-60 machine, perhaps first on West Coast, in use from 1956-1987, 31 years of service.

Picker Cobalt - 60

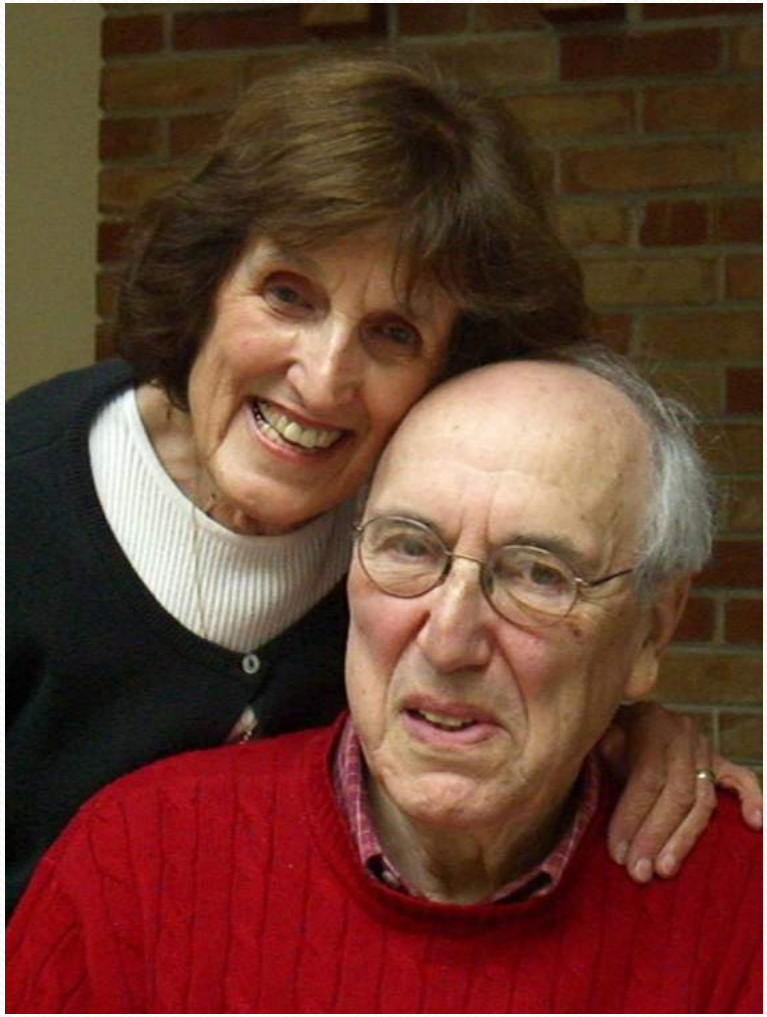




GURE IV-12. Photograph of a Picker ceiling-mounted cobalt unit installed at the Ontario ncer Institute in Toronto. The unit uses the multiplane collimator illustrated in Figure IV- a. The inserts show on the left, the field wide open (20 × 20), and on the right, adjusted give an elongated field (6 × 20).

Figure IV-13 shows a rotation cobalt unit developed at the Ontario ancer Institute (24). The unit contains an x-ray tube whose focal spot ccupies a space just slightly behind th

Irving (84) & Della Horowitz



- Irving – M.D. at U of Michigan, intern UOMS 1952-53, Del was head nurse 3W Multnomah county hospital. Irv may have been first married intern here.
- 1953-55 – Army service
- 1955-58 Radiation Oncology Res. at U Michigan, I. Lampe
- 1958 to 1987, with Hymans in Portland at 2311 NW Northrup.
- 1987 to 1993 – Good Samaritan Hospital Cancer Center

Hyman, Hyman & Horowitz office Highlights

- Patients referred from throughout the state & region.
- Radiation oncologists came from throughout the country to see how they treated patients in early years.
- Used clinical rather than mathematical approach.
- Impressive results, especially with head & neck tumors.
- Used reducing-field technique to give higher central dose and less dose to sub-clinical volume.
- Used diagnostic x-rays to set up fields, took radiation port films, and documented fields with Polaroid photos
- Highly respected by medical community.

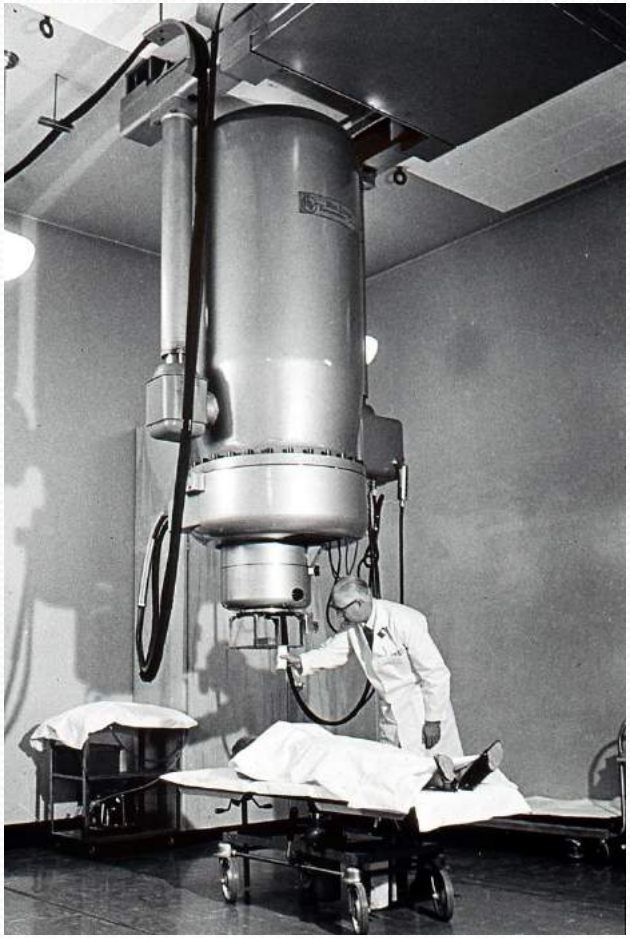
Ken Stevens with Irv Horowitz (84). Dale Ostlund (84) with Machlett tube

October 2008

Clifford V. Allen, Chair Radiation Therapy, UOMS Faculty – 1955 to1972

- M.D., U of Iowa 1933
- Longview, WA, General Practice 1935-52
- UOMS Radiology Resident & Seattle Swedish Tumor Institute 1952-55
- PVAH Chief Radiotherapy 1955-1960, Consultant 1960-1972
- UOMS Director of Radiotherapy, 1960-1967
- Chair, UOMS Radiotherapy Dept. 1967-1972, FACR 1958
- Pre-op Rectal Irradiation pioneer, 1960
- Splendid and caring clinician

OHSU Van de Graaff 2-Mev X-ray



- Installed in 1958, in side-building between 4th & 5th floors on west side of South Hospital.
- OHSU received one of ten Van de Graaff machines given by Donner Foundation to U.S. institutions in 1957.
- Valued at $90,000.
- Dr. Clifford V. Allen, M.D.

OHSU Van de Graaff generator

- Van de Graaff 2 Mev, with medical physicist Ray Fry, 1972.
- In 1971 it was moved from side building to 4th floor of new C-wing of South Hospital.
- It was used from 1958 to 1982, total of 24 years of service.

OHSU Van de Graaff, 1958 to 1971, side building west of South Hospital, between 4th & 5th floors, where Hatfield Building is now located

Juanita “Nellie” Nelson, R.N., technologist, loved patients and her Van de Graaff machine

“Jolly Green Giant”

Firsts in Oregon

- 1956 – Drs. Milton and Selma Hyman installed first Cobalt-60 Machine in private office NE 23rd and Northrup, next to Good Samaritan Hospital. May have been first Cobalt-60 treatment machine on West Coast. Original machine was used for 31 years: 1956 to 1987.
- January 1967 – U of Oregon Medical School/OHSU, Department of Radiation Oncology was first Radiation Oncology Department in a U.S. academic center. It was a one-M.D. department: Dr. Clifford V. Allen, M.D. Tufts University, Boston, was 2nd department in July 1968.

Firsts in Oregon

- Very early experience with high-dose pre-operative irradiation for rectal cancer begun in 1960 at OHSU. "Cancer" journal article in 1978 documented ability to do anterior resection & re-anastomosis for rectal cancer. This was a major change in the treatment of rectal cancer.
- High-dose reirradiation of head and neck cancer with curative intent, OHSU study published in IJROBP in 1994 regarding treating 100 such patients.
- Ted Williamson's software development: Adac treatment planning, Oncolog patient & tumor registry

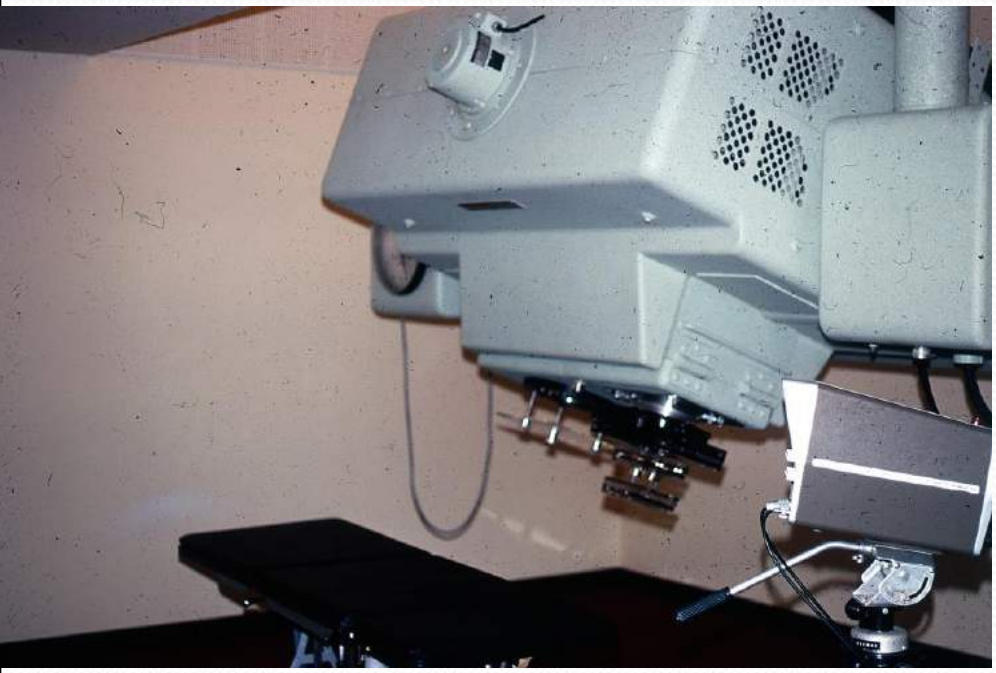
UOMS/OHSU Cobalt-60 machine 1968-1987

Claudine Stone, Technologist,
RTT Program Coordinator from 1971 to 1976

- Picker Cobalt-60 machine, 80 cm source to axis distance.
- First installed in basement of north addition of Dillehunt Hall.
- Moved to 4-C South Hospital in 1971, removed in 1987.

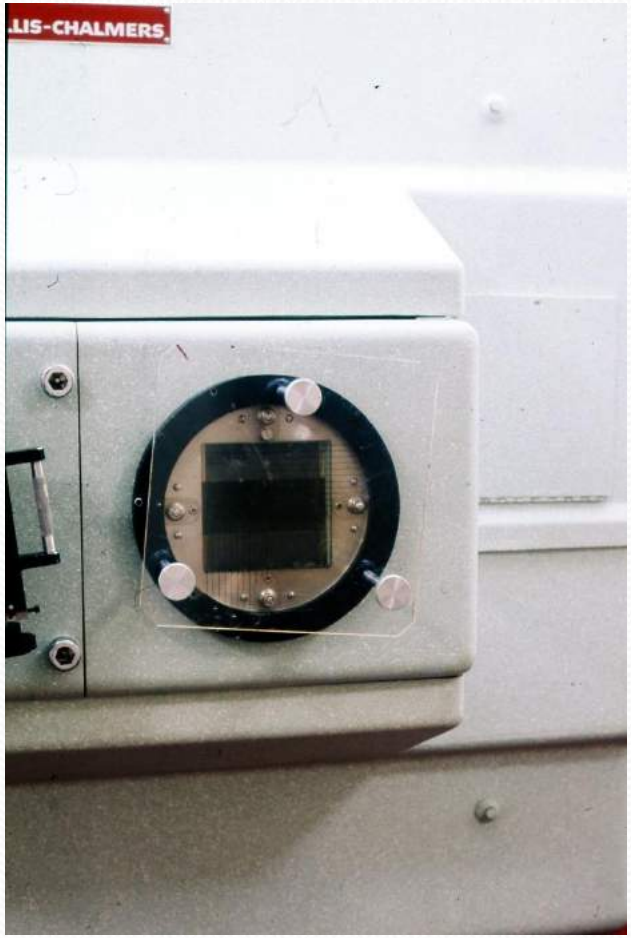
OHSU 25-Mev Betatron – Allis Chalmers

$250,000 donation

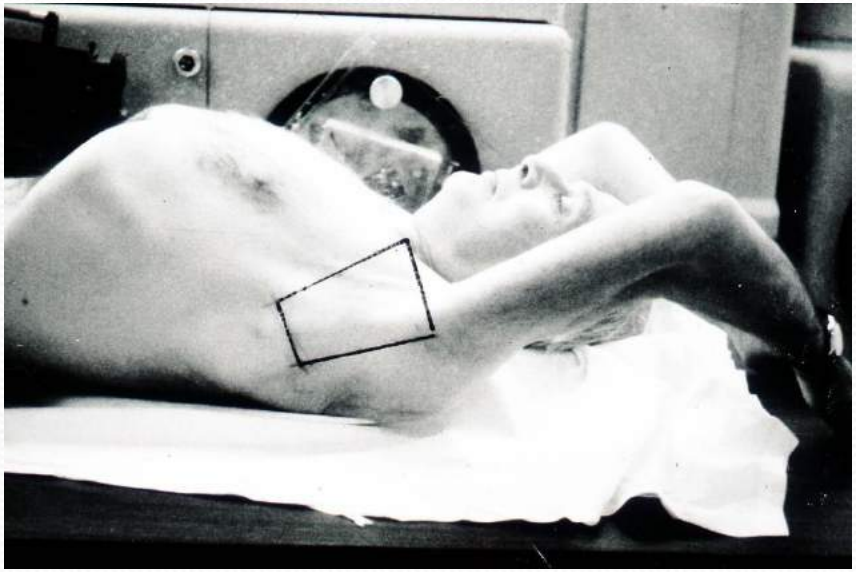


- Installed in new OHSU Radiation Therapy Department on 4th floor 4-C South in 1972.
- 25 Mev photons/X-rays, 15 x 15 cm field at 100 cm, very penetrating radiation, slow radiation output.
- First electrons in Oregon, 8 to 24 Mev, small fields with treatment cones.
- Massive & very noisy machine, patients used earplugs, head phones to block sound.

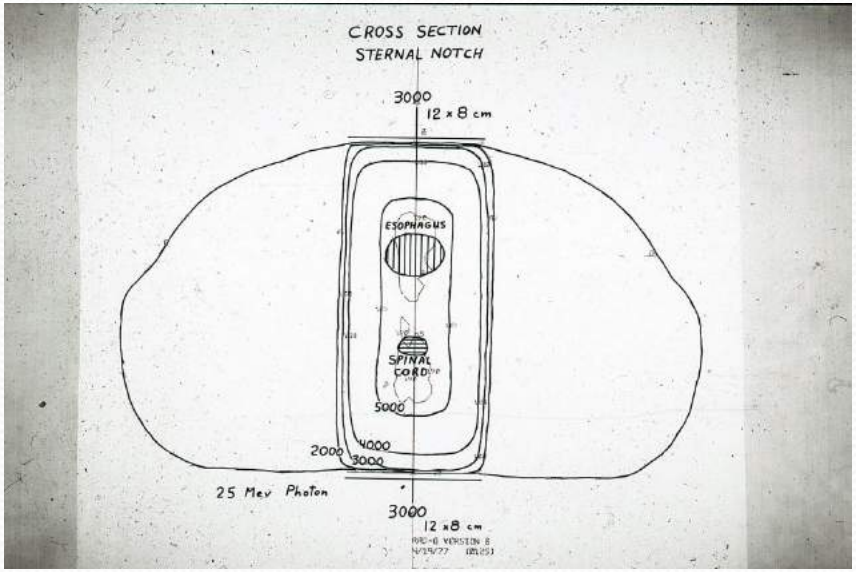
Betatron – 25 Mev, photons & electrons

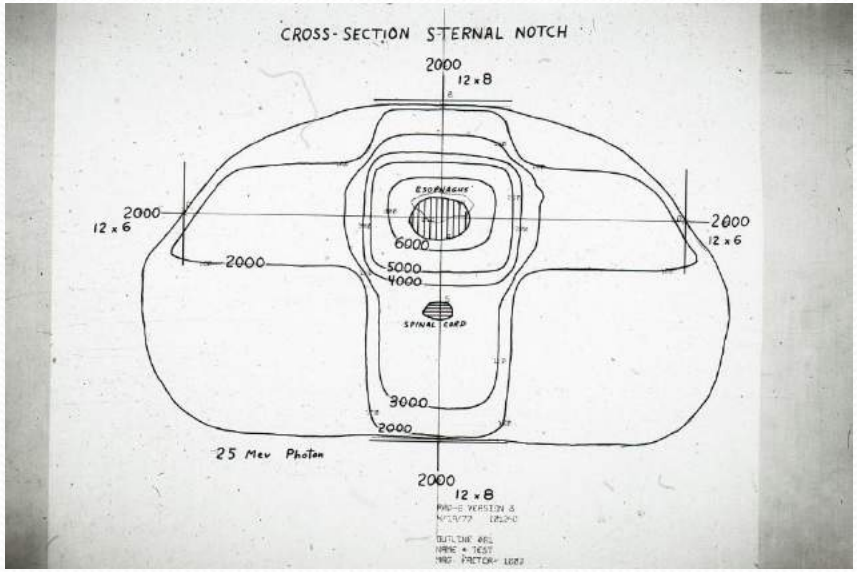


OHSU Betatron – Thoracic Inlet tumor

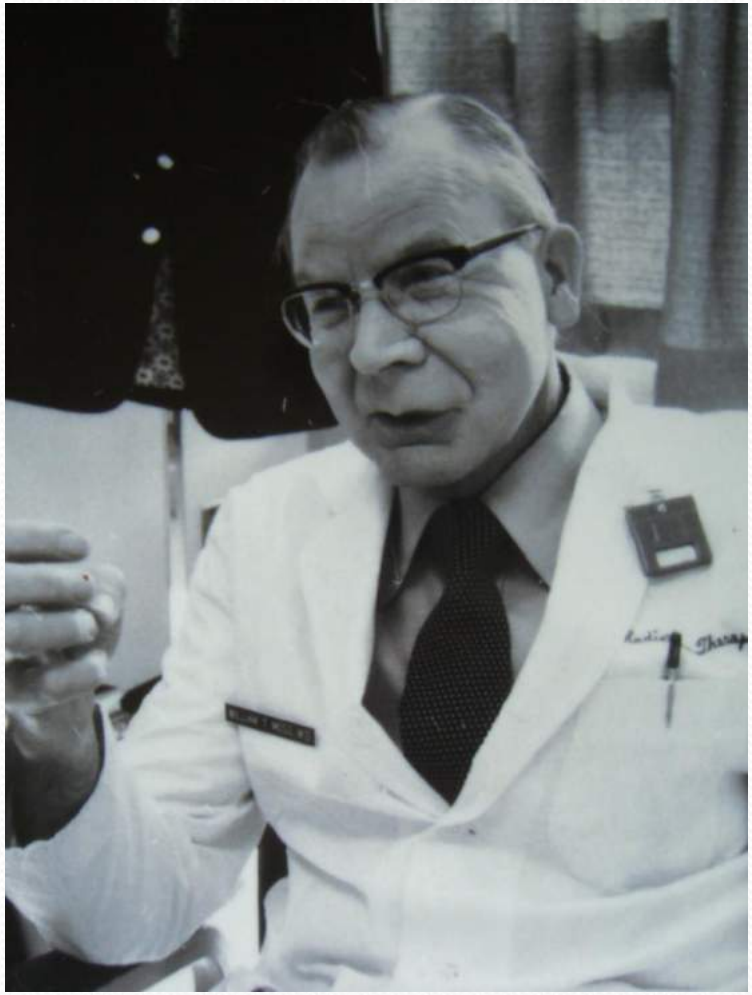


2-field AP-PA, compared to 4-field “box” treatment which protects normal tissue (spinal cord) Betatron 25 Mev-X-rays





Dr. William "Bill" Moss, UOMS/OHSU Radiation Oncology Department Chair - 1974 to 1989

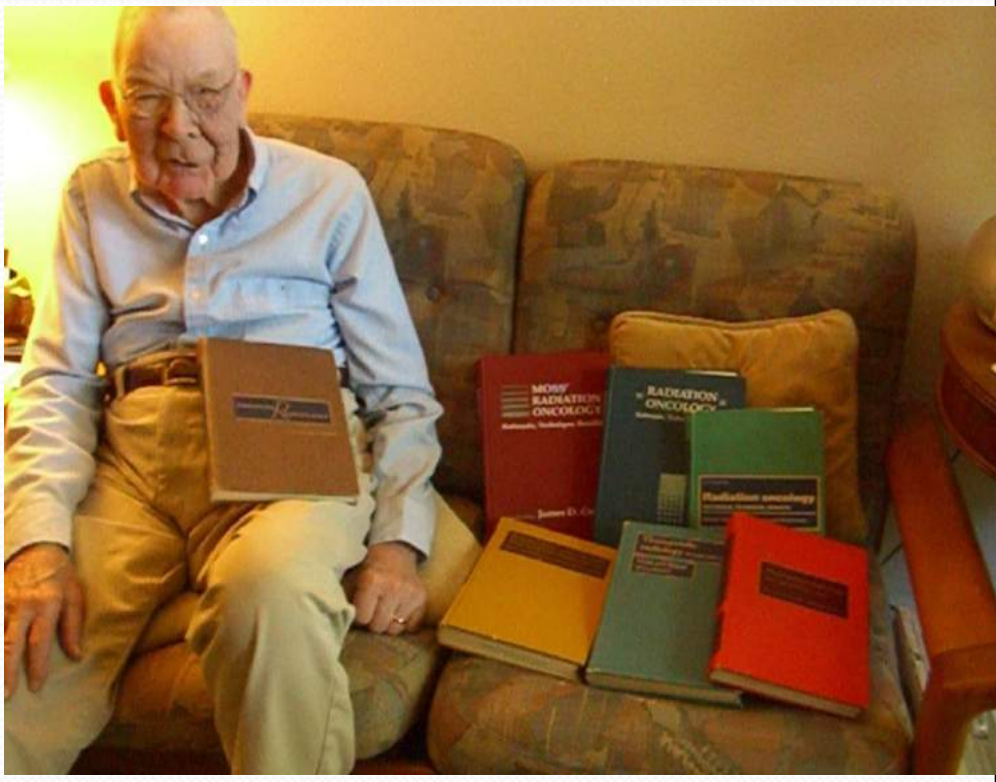


- M.D., Washington Univ. 1944
- Radiation Oncology training Columbia, MO 1945-6, 1948-50, & in England & France
- Chief, Columbia & St. Louis, MO 1950-53
- VA & NW University 1953-74
- President - ASTRO 1973-74
- Gold Medals : ASTRO 1981, Am College Radiology 1990
- ASTRO Fellow 2006

Dr. Bill Moss with 7 editions of his premier Radiation Therapy/Oncology text,

90 years young -10/30/2008

- 1959 –author of **Therapeutic Radiology**
- 2nd Edition - 1965
- 3rd Edition - 1969
- 4th Edition - 1973
- 5th Edition - 1979
- 6th Edition – 1989
- 7th Edition – 1994,
- edited by James Cox



OHSU, 6 Mev Linac, 1991, larynx cancer, tape immobilization, rope to lower shoulders

OHSU in 2001, replacement of Linac 2100C with newer Linac 2100EX.

Out with the old – In with the new

OHSU 2002, Ken Stevens and Carol Marquez; Physicists: Phoebe Schulman-Edelman, Darryl Kaurin, Calvin Chan, Ray Garcia (dosimetrist)

UOMS/OHSU Radiation Oncology Residency Training Program

- Dr. Clifford Allen was first UOMS radiology resident (1952-55) to become full-time radiation therapist/oncologist.
- John Gallucci was first UOMS resident to have three years of radiation therapy residency (1963-1966).
- Ken Stevens was second resident to have three years of radiation therapy residency, from 1967 to 1970. There have been continuous full-time radiation therapy/oncology residents at UOMS/OHSU since 1967.
- OHSU became four-year residency in 1996.
- Total UOMS/OHSU residents trained as radiation therapists/oncologists - 55, including those now in training.

OHSU, 1993: Chang, Moss, Marquez, Pearse, Gemmell, Stevens, Clover

2004: Stevens, Patel, DePaulina, Marquez, Hung, Sanghvi, Holland, Gagnon, Canning

OHSU faculty and residents & families at Stevens home in 1997.

Bill & Rose Moss

Ray Fry and Marsha, 3/31/1998 last day as OHSU medical physicist.
Lucia Clover, Julie Gemmell, Linyee Chang, Russ Hinerman, Bruce Frey, Harper Pearse, Kenneth Stevens in July 1992.

OHSU 1976: Daphne Tong (resident 1973-1976),
Claudine Stone (RTT Program Coordinator 1971-1976),
Beth Locatell, (RTT Program Director 1976-1982)

1990s Julie Rettinghouse (Chief Technologist),
Anna Lauderbaugh (Aide),
Nancy Friedman, (RTT Program Director 1982-1991)

UOMS/OHSU Radiation Therapy Technology Training Program

- Certificate Program began in 1971-72; total of 84 graduates during 23 years from 1971-72 to 1993-94.
- Baccalaureate Program began in 1993; total of 80 graduates in the 14 classes from the 1993-95 class to the 2006-08 class.
- Program Coordinators/Directors: Claudine Stone, Beth Locatell, Nancy Friedman, Anne Maddeford.
- While serving as President of the Board of Trustees of the American Registry of Radiologic Technologists in February 1990, Dr. Kenneth Stevens made the motion for the ARRT to begin using the title “Radiation Therapist” for those trained in Radiation Therapy Technology.

OHSU 1992: Anne Maddeford (RTT Program Director) with students.

Summer 1995: Stevens and Fry with RTT graduates.

OHSU Picker Simulator in 1980s

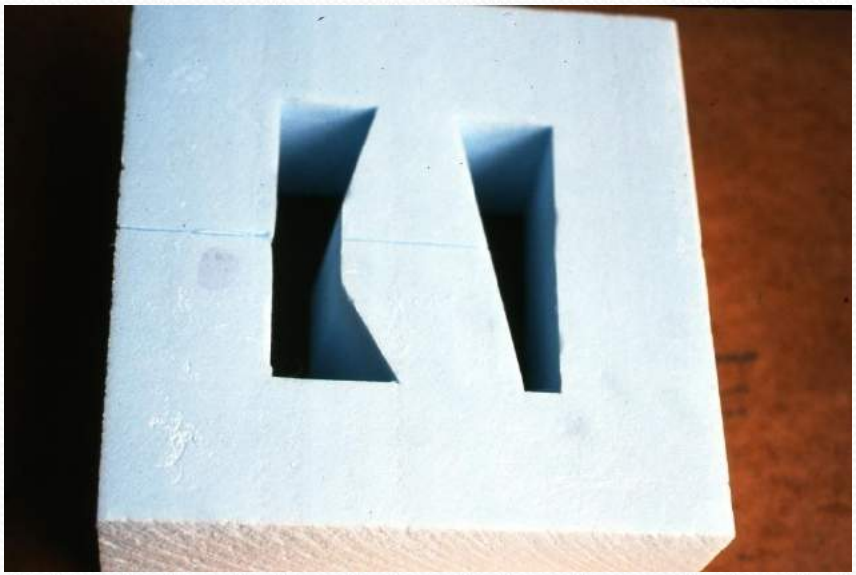
- Simulates treatment machine, uses diagnostic energy X-rays and fluoroscopy.

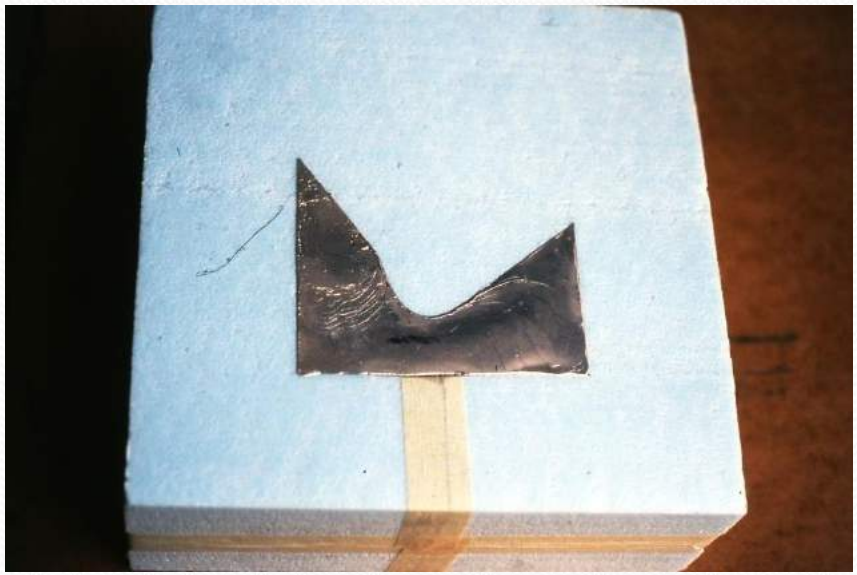
Treatment Planning Computers

- In 1960s calculations were performed with slide rules.
- Early computerized treatment planning equipment in 1970-80s.
- Traced fields from simulator films.

Custom Cerrobend Blocking: styrofoam mold-cutter and hot-pot

Custom Cerrobend blocking with styrofoam molds and low-melting-temperature cerrobend metal, 1980-2005, still used for electrons.





OHSU Radiation Oncology Nurse

- Karen Maher, R.N, first radiation oncology nurse in Oregon, at OHSU
- Served many years at Good Samaritan Hospital in Portland
- National Award - Top Radiation Oncology Nurse

Oregon Radiation Oncologists in 1980 – Total of 21

Portland: 14 in Portland

Milton Hyman, Selma Hyman, Irving Horowitz, R. Dale Ostlund

Emanuel Hospital: Norm Willis, Mike Goldman

Good Samaritan: John Gallucci

OHSU: Bill Moss, Ken Stevens, Jim Gagnon

Providence Portland: John Molendyk, Fredrick Wagner

Providence St. Vincent: Richard Lowy, Eugene Jackson

Salem: Kirby Allen, Margaret Thompson, Ted Williamson

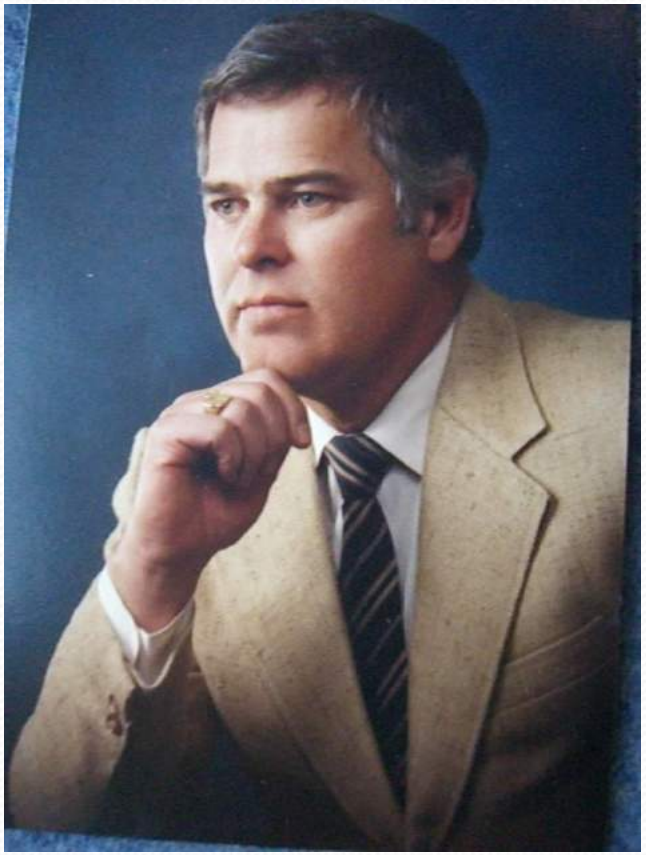
Eugene: Clay Racely, Jeffrey Shafer, John Shaw

Medford: John Ptacek

Continuing Medical Education

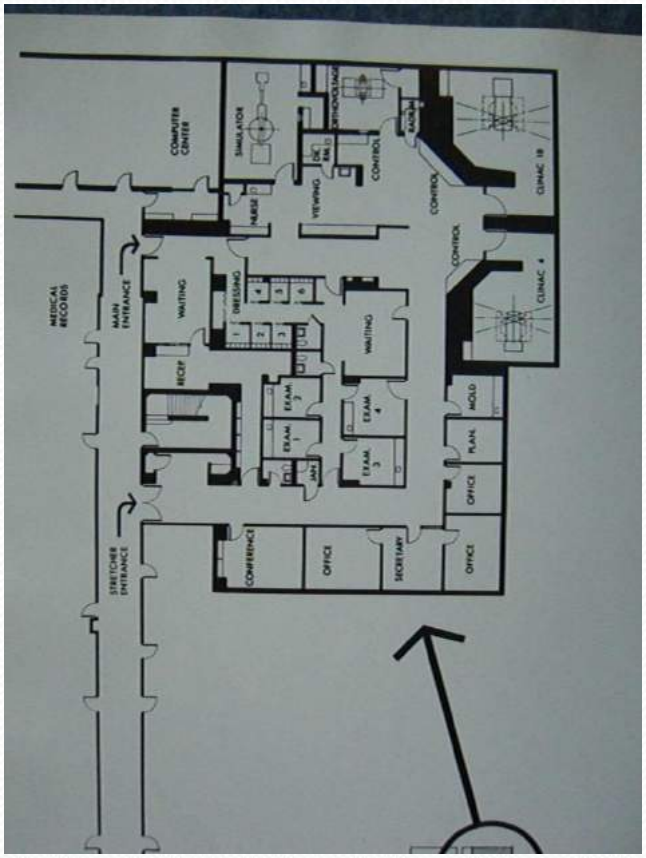
- Pacific Northwest Radiological Society Meetings
- John Tomlin Memorial Cancer Lectures in Medford
- Salem Memorial Hospital Mid-Willamette Valley Cancer, Conferences at Salishan 1978 – 1990
- OHSU Radiation Oncology Teleconferences with national radiation oncology experts, abt 1980 to 1989.
- Hospital Conferences
- Oregon Radiation Oncology Society – OROS, organized in early 1980s

John Molendyk – 1972-2008 Providence Hospital



Providence Hospital Radiation Oncology Dept. – 1972 Construction

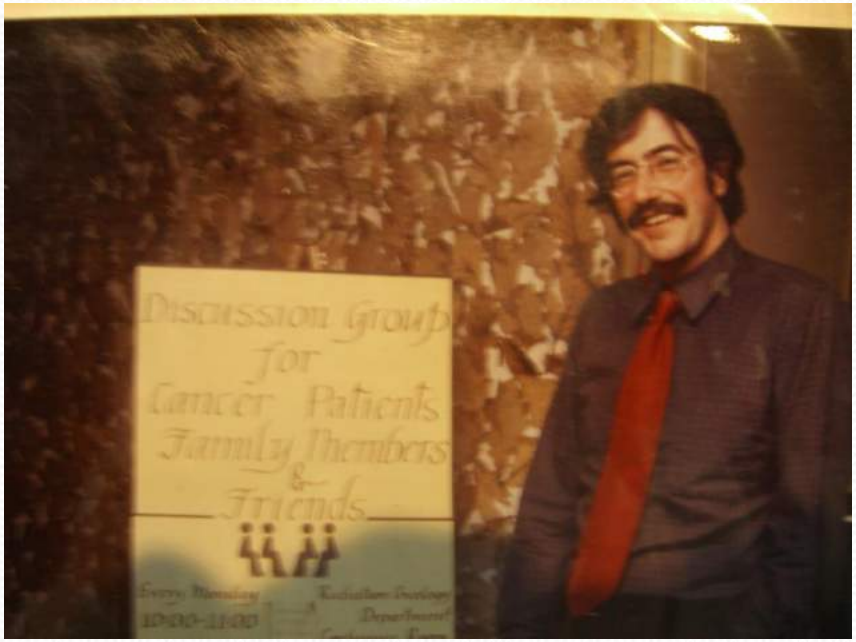
Blueprints



Concrete Construction

Elekta accelerator at Providence with Steve Bader -2008

Richard Lowy, St. Vincent Hospital 1972
Support groups for patients & families.
Weekly chart rounds with department staff.



St. Vincent Hospital
Jerry Albrich 1982-1997, 2009 photo

Richard Lowy – St. Vincent Hospital

- M.D. New Jersey Coll Med.
- Residency San Francisco, Mt. Zion Saroni Tumor Institute 1966-70, last year in England
- Staff at Mt. Zion, 1970-72
- St. Vincent, 1972-1996
- Excellent physician, excellent care of patients and department staff
- St Vincent & Providence Portland consolidated radiation oncology in 1996

Norm Willis and Bob Miller in 1972-3 at UCLA

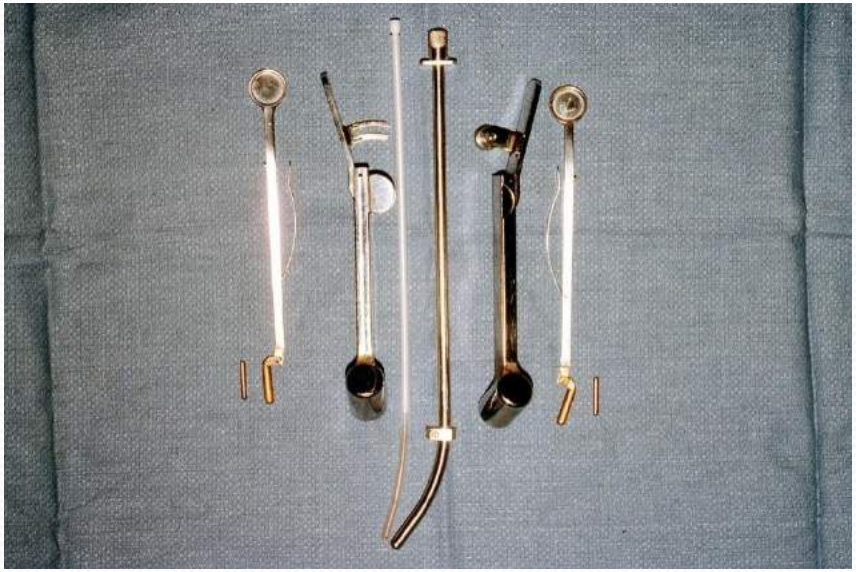
Emanuel Hospital Cobalt-60

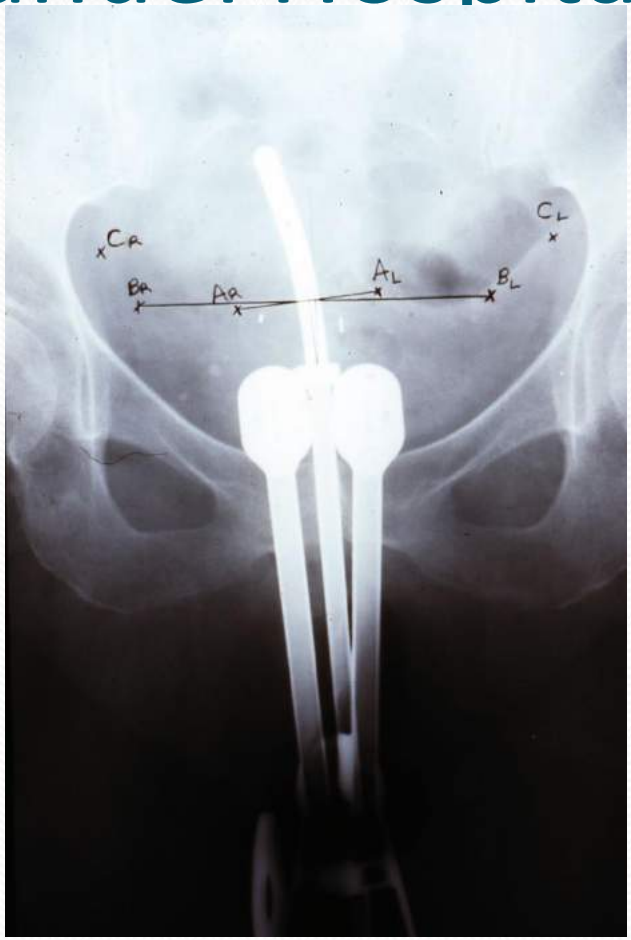
- Cobalt-60 at Emanuel Hospital, 1975, gantry & head rotated for total body irradiation

Emanuel Hospital – 4-Mev Linac

- Emanuel Hospital 4-Mev linac, 80 cm Source-axis distance

Fletcher-Suit Gyn Implant – Norman Willis – Emanuel Hospital





Portland Good Samaritan Hosp.

John Gallucci

Mark Schray – first HDR in Oregon in 1991, photo is 2009

- UOMS Resident 1963-66
- Practiced in San Francisco
- Returned to Portland – Good Samaritan Hospital from 1970 (Cobalt-60) to 1988, went to Washington state
- Hyperthermia at Good Sam
- Practicing in Washington since 1998, now part-time in Auburn, Washington

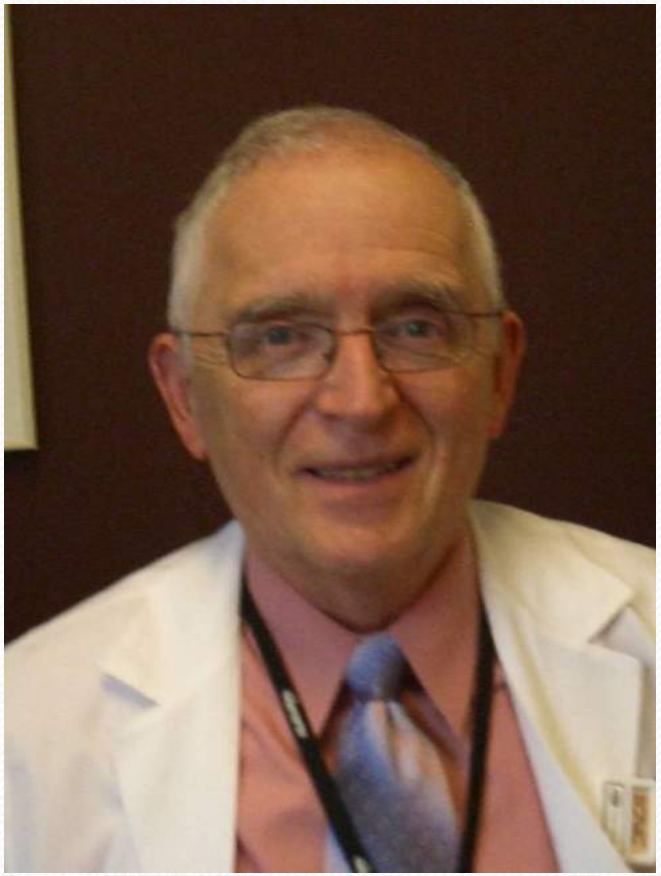
Salem Memorial Hospital

- Kirby Allen – wife Amy (family practice) (1972), 1974
- Marge Thompson -1973
- Ted Williamson – 1978 developed treatment planning (Adac) and tumor registry software (Oncolog).

Salem Memorial Hospital

Marge Thompson

Ted Williamson



Mike Huntington – Corvallis Good Samaritan Hospital

- UOMS Radiation Therapy Resident 1971-74
- Montana 1974-81
- Medford, Oregon 1981-4
- Corvallis 1984 to present
- Health policy activist

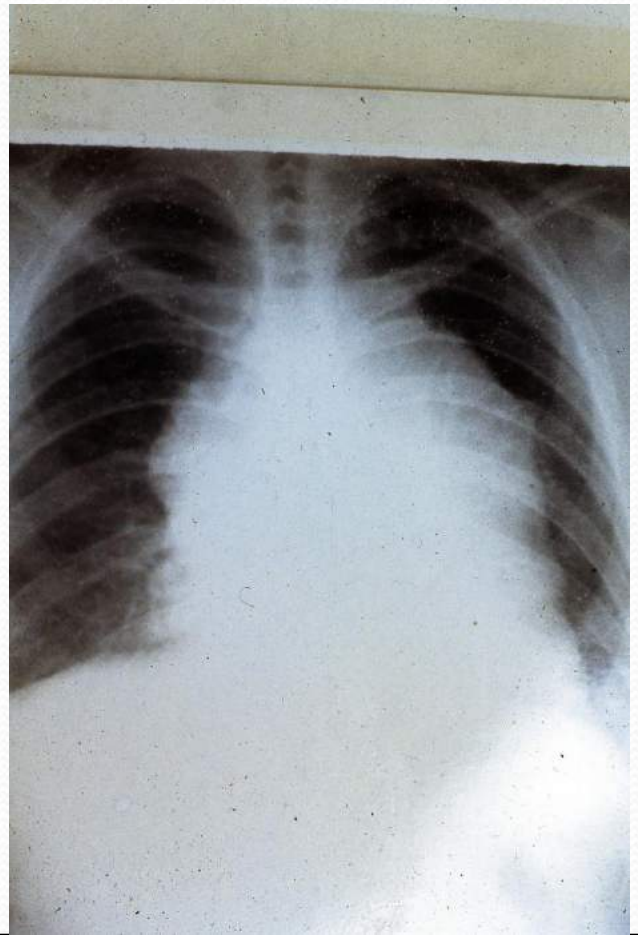
OHSU, 1969, Tonsil Cancer before and following irradiation, cancer cure with preservation of normal tissue.

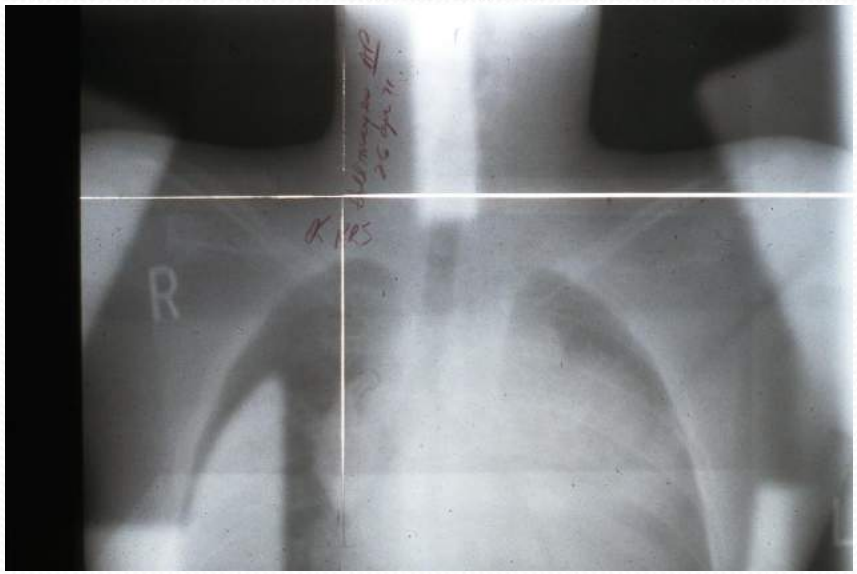
WOW! – Cancer Cured

Cancer of Tonsil, same patient But, Late Radiation Effects

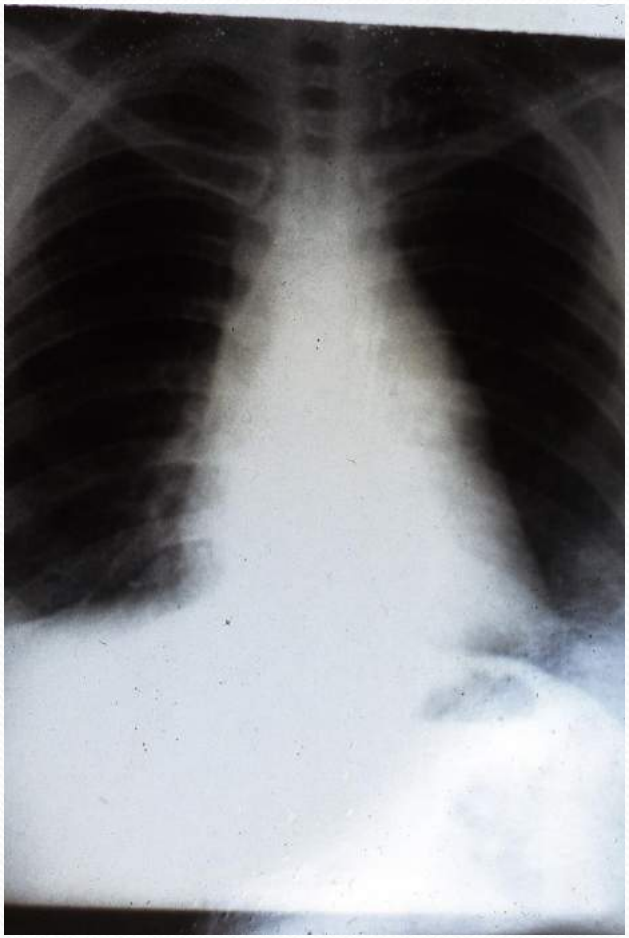
- Tonsil Cancer Patient two years following irradiation
- Dry mouth, typical decay of teeth at gum line, from radiation of salivary glands in radiation field.

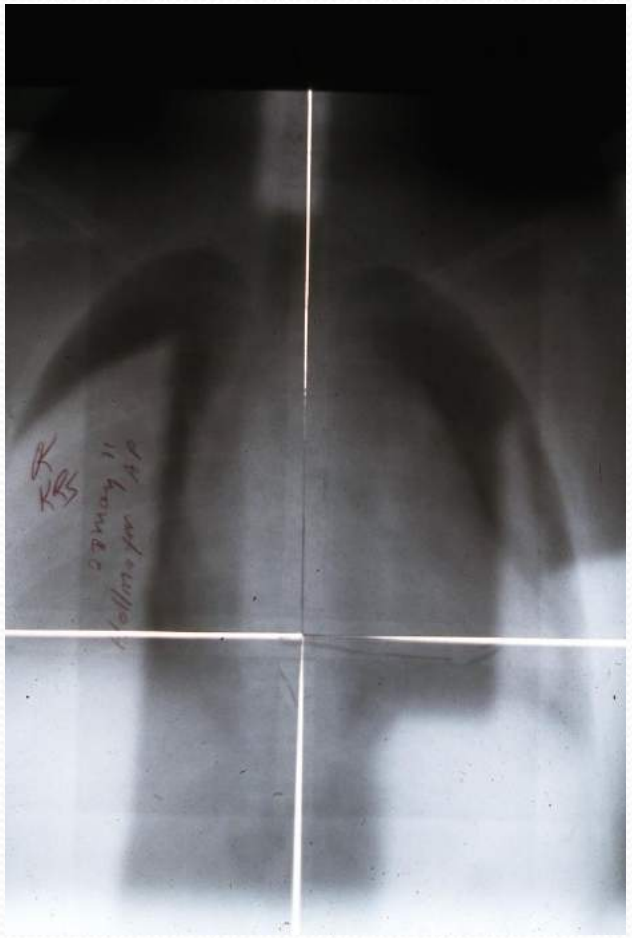
Hodgkins Disease, 1971, initial radiation field to 2000 rad





Hodgkins Disease 1971, reduced boost field for final 2000 rad





Ewings Sarcoma, distal right thigh – 8 year old boy in 1972, photo 12 years later, preserved leg, cured.

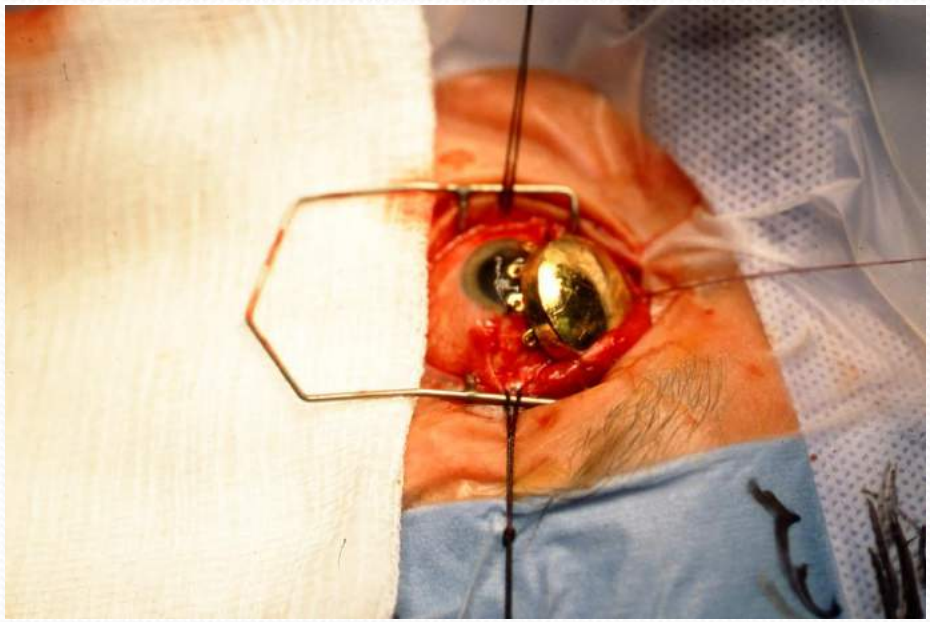
1945, infant with retinoblastoma, left eye removed, right eye irradiated with orthovoltage (Kilovoltage) by Dr. Selma Hyman at UOMS.

Late effects a year later and 40 years later-sarcoma

One-year old child with retinoblastoma, treated with 2 Mev x-rays in 1972

- Horizontal beam, lead blocks stacked to shape radiation field, co-planar beam at anterior field edge.
- Child sedated and immobilized in vacuum-bag.

Choroidal (eye) melanoma treated with Iodine-125 seeds in gold plaque, 1980s to present



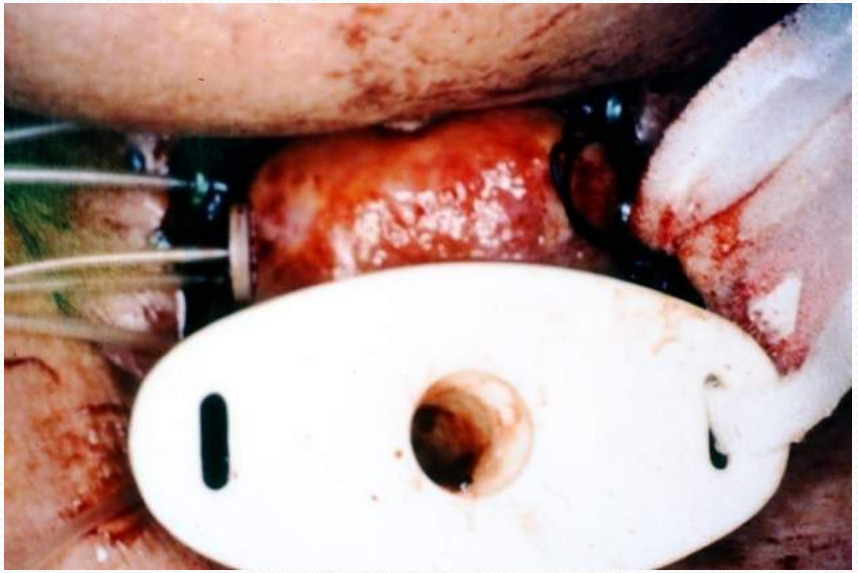
Medical Innovation

Informing a patient:

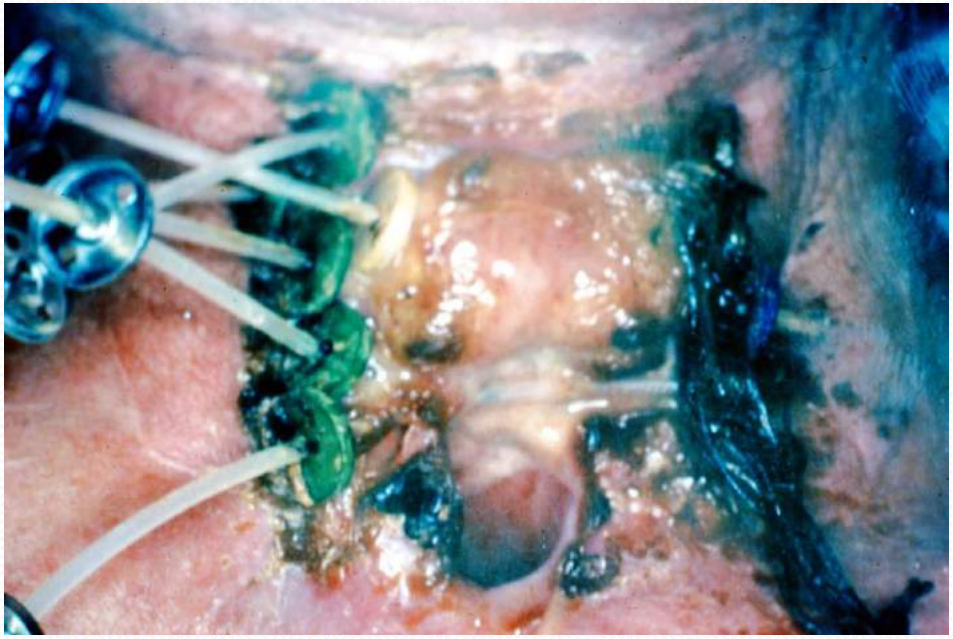
I've never done this before,
But I do know what I am doing.

At least, I think I do.

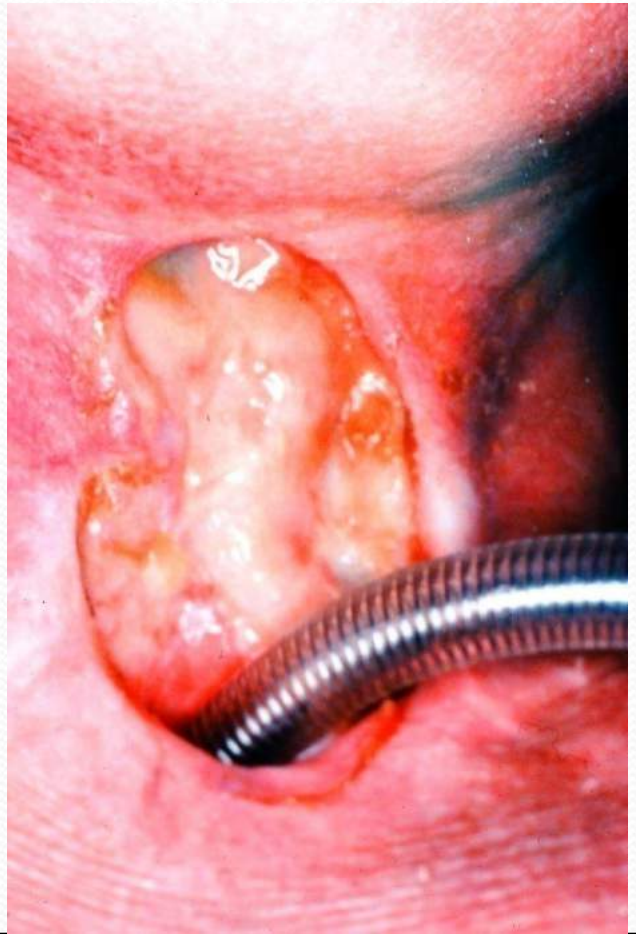
Re-irradiation in 1988, woman with larynx stomal recurrence after prior irradiation & laryngectomy. OHSU experience with 100 re-irradiated head & neck patients, reported in IJROBP, 1994



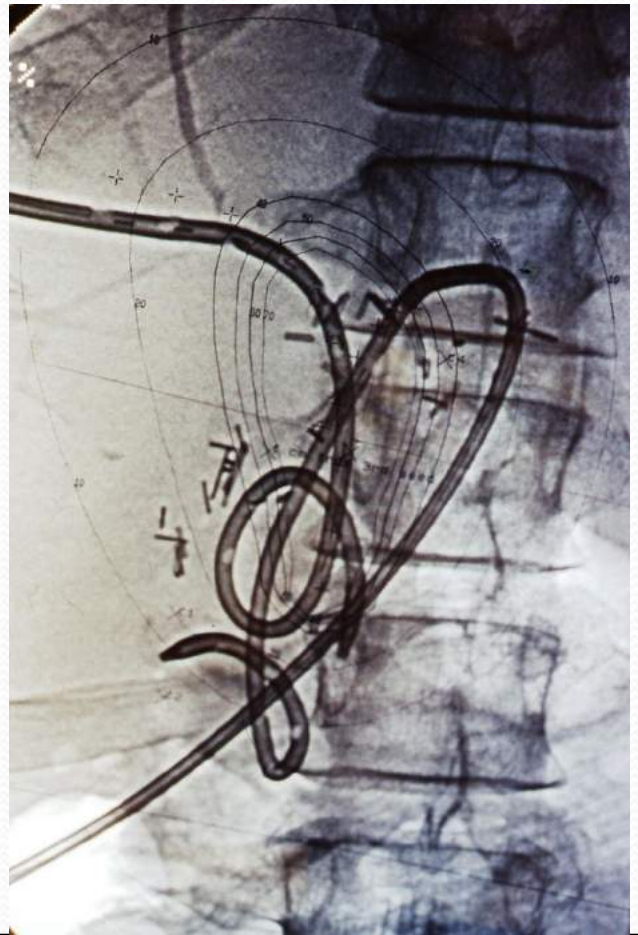
Tumor necrosis at completion of 4-day Iridium-192 implant, and normal tissue necrosis developing 4 months later

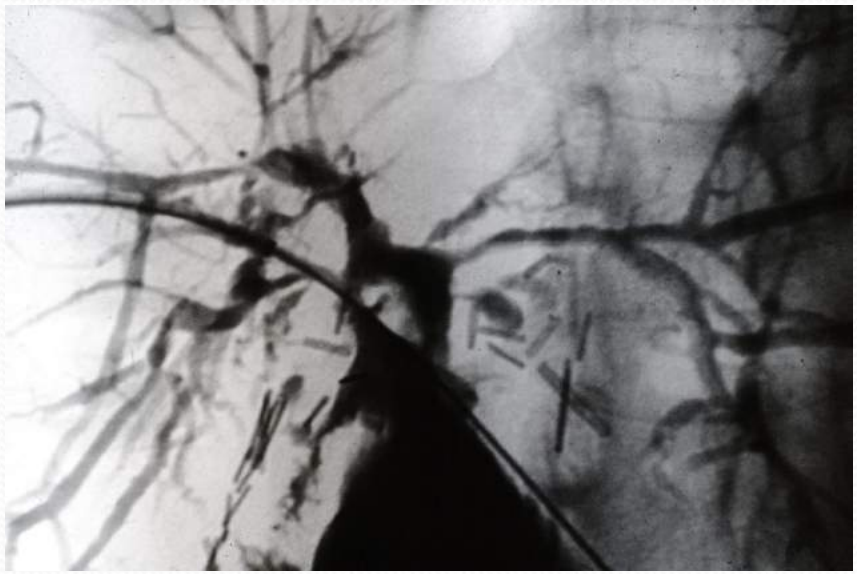


At 9 months, necrosis was debrided and skin grafted, appearance 3 ½ years after re-irradiation. Shows need for close cooperation between radiation oncologist and surgeon.



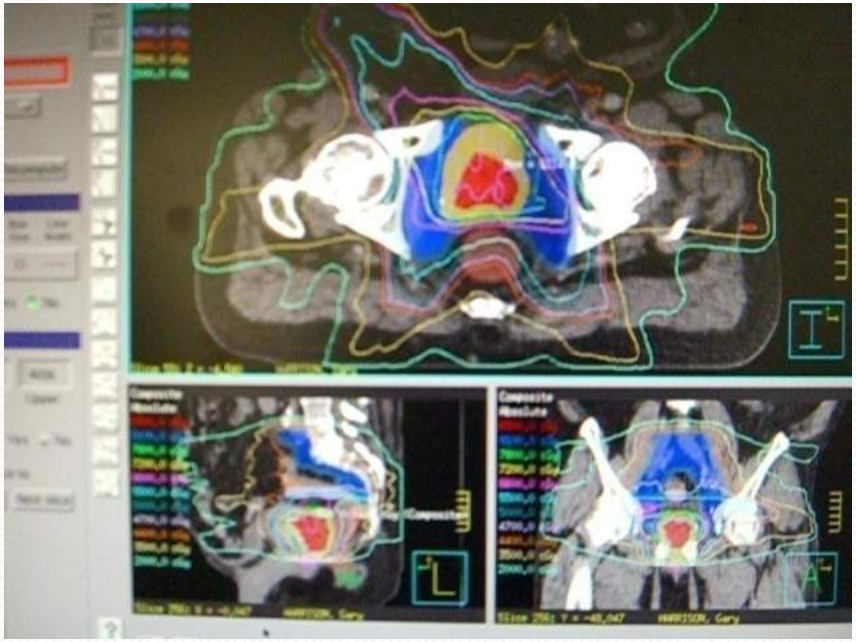
Biliary Cancer, 2-catheter Iridium-192 implant in 1996, hepatogram 4 ½ years later, OHSU, no evidence of tumor.



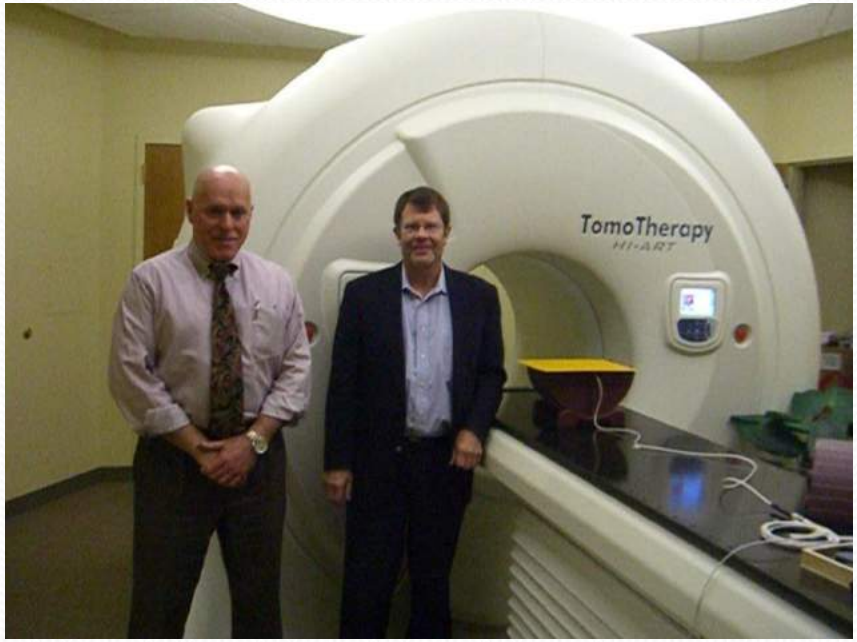


High-Dose Rate Iridium-192 Brachytherapy After-Loader - OHSU

IMRT – intensity modulated radiation therapy, computerized treatment planning and multileaf collimators –Tuality/OHSU Cancer Center, 2008

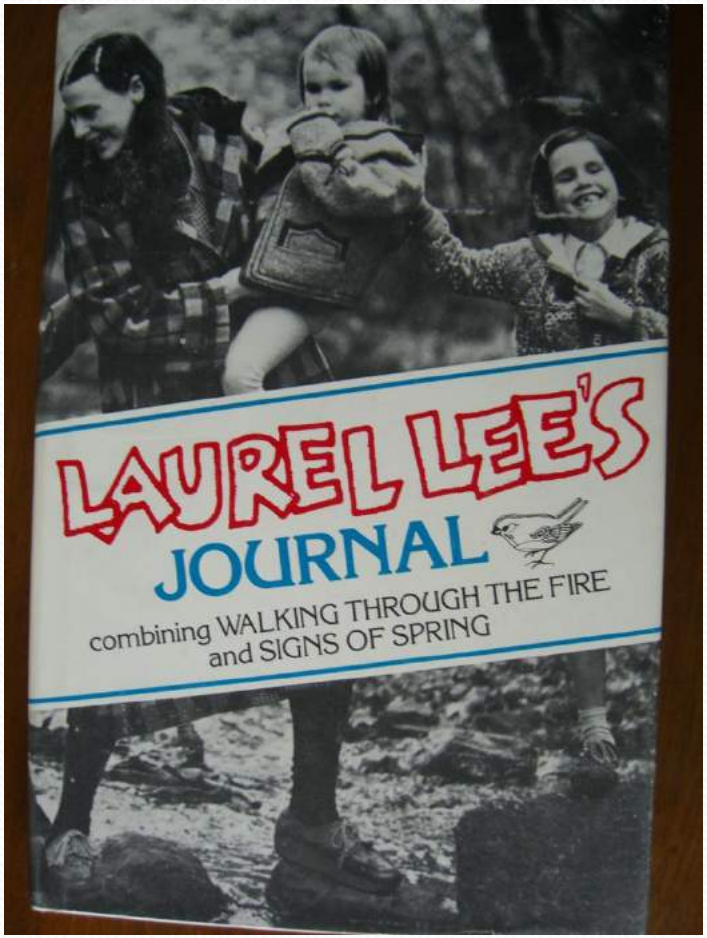


Tomotherapy- rotational 6 Mev x-rays, Meridian Park Hospital, Norm Willis & Bob Miller



Public Advertising – Cancer Care

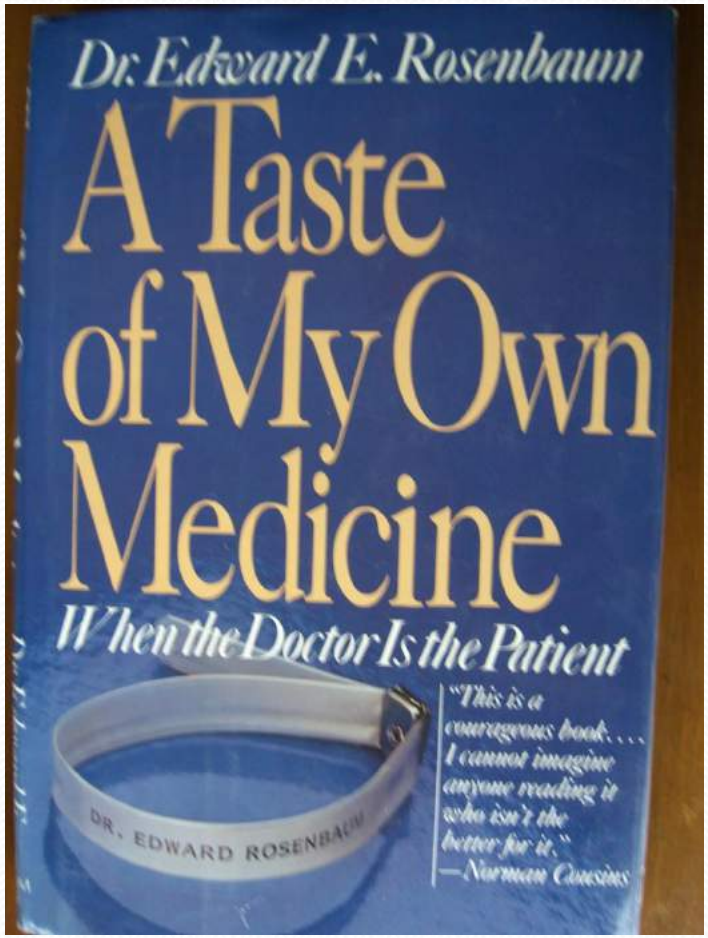
Patients' stories: Laurel Lee – "Walking Through the Fire" book & movie

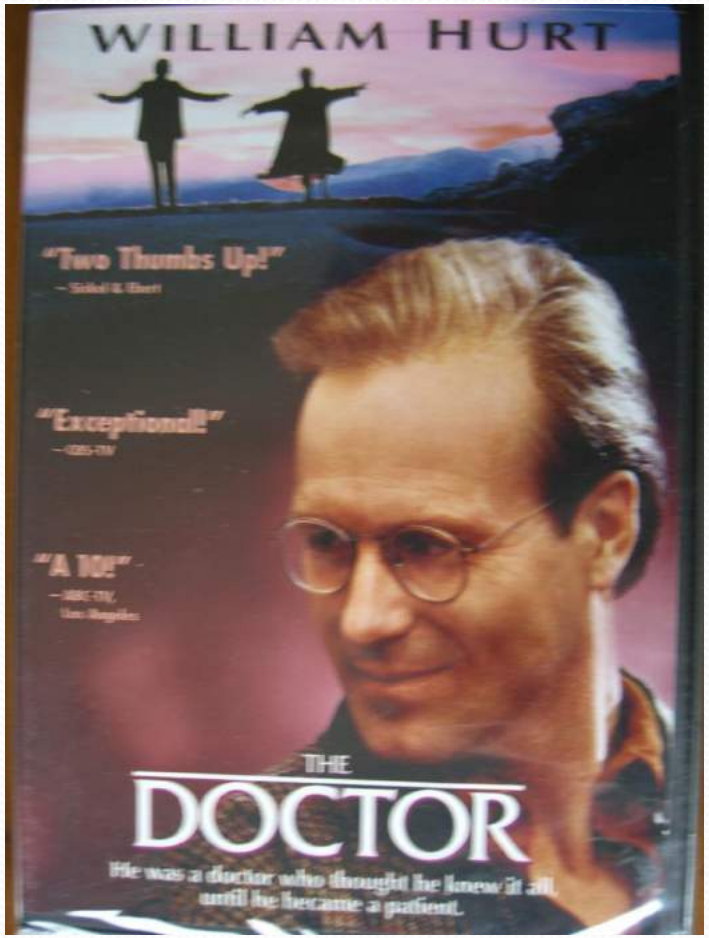


Patients' stories: Book & Movie

Dr. Rosenbaum "A Taste of My Own Medicine"

Movie: "The Doctor" –William Hurt





OHSU Radiation Oncology Department Chairmen in 2006 Charles Thomas 2005 to present, William Moss 1974 to 1989, Kenneth Stevens 1972-4, 1989 to 2005

Radiation Oncologists in Oregon, January 2016
About 80 in Oregon, 10 in adjacent Washington

- Portland metro area
- Salem
- Eugene
- Medford
- Roseburg
- Grants Pass
- Coos Bay
- Bend
- Corvallis
- Klamath Falls
- The Dalles
- McMinnville
- Washington state: Vancouver, Longview, Walla Walla, Kennewick

Current & Future Plans for Radiation Oncology Programs in Oregon

- Joint venture of OHSU with new Astoria Medical Center radiation oncology department
- Partnership of OHSU and Salem Medical Center
- Shared interest of OHSU with Mid-Columbia Medical Center in The Dalles
- Collaboration of OHSU with Legacy Health Care

Appreciation & Gratitude for:

- Physicians – Radiation Therapists/Oncologists
- Technologists/Radiation Therapists
- Medical Physicists
- Dosimetrists
- Nurses
- Support Staff
- Biomedical Engineering - to keep machines running
- Patients and their families & friends
- Benefactors

When thou walkest through the fire, thou shalt not be burned. *Isaiah 43:2*