The Future of Healthcare Delivery in the 21st Century – Contributions of TeamBest Companies & Best Cure Foundation





Best medical international

TeamBest Theratronics ASIA

Best Cyclotron Systems

Best Particle Therapy

Best Theratronics

Best medical canada

Best medical italy

Best vascular











Best Dosimetry Services











Your Total Solutions™ Provider!



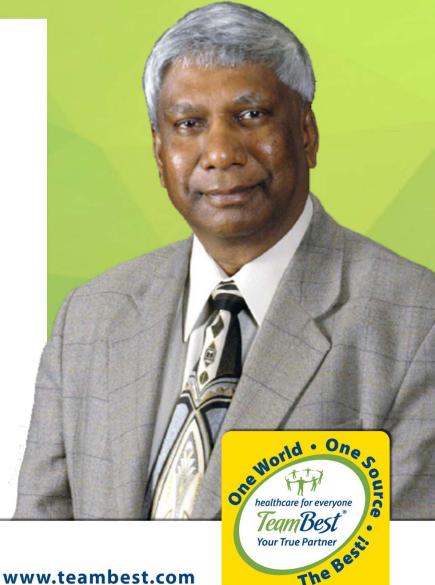
About Krishnan Suthanthiran

President TeamBest Companies & Founder of Best Cure Foundation

A healthy person has many wishes, but the sick person has only one. Health is wealth.

- Indian Proverb -





About Krishnan Suthanthiran

President TeamBest Companies & Founder of Best Cure Foundation

Life is a gift from our parents. We are born to live, and live to enjoy and cherish our gift. We can look at every obstacle as an opportunity or every opportunity as an obstacle. Who we are, what we are, and where we are, have a lot to do with the choices we have made and the ones we did not. Our career and service to the community are the outcome of what we do with the gift.

- Krishnan Suthanthiran -



world . One

ABOUT KRISHNAN SUTHANTHIRAN

Krishnan Suthanthiran immigrated to Canada from India in September 1969 after graduating with a Bachelor's Degree in Mechanical Engineering from University of Madras, India, to pursue his Master's Degree in Mechanical Engineering at Carleton University, Ottawa, Ontario, Canada. He arrived with a total of 400 Canadian Dollars. Subsequently, he received a National Research Council of Canada Research Assistantship, and graduated with a Master's Degree in 1971. He moved to the United States in 1972 and worked as an Engineer Physicist at Howard University Hospital in Washington, DC, USA until 1978.



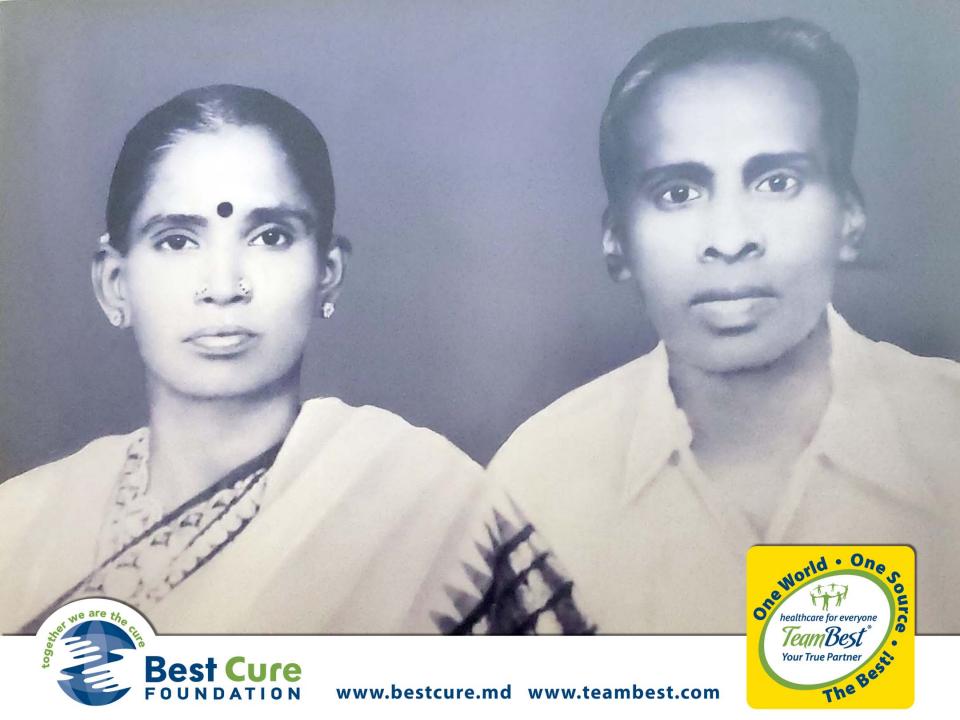
world . One

ABOUT KRISHNAN SUTHANTHIRAN (cont.)

Having lost his father to cancer while he was an undergraduate student in engineering, he has dedicated his career to cancer prevention, early detection and effective treatment for the Total Cure. He has founded and invested globally many millions of USD in medical, real estate, construction, entertainment, and energy companies. He founded and currently is supporting a few non-profit charitable foundations to promote quality education and healthcare and making them affordable and accessible. He has contributed substantially to setting up endowed chair and endowments for scholarships. Also, he has provided significant funding to support medical research and treatment by partnering with academic centers, national labs, and hospitals globally.



World . One

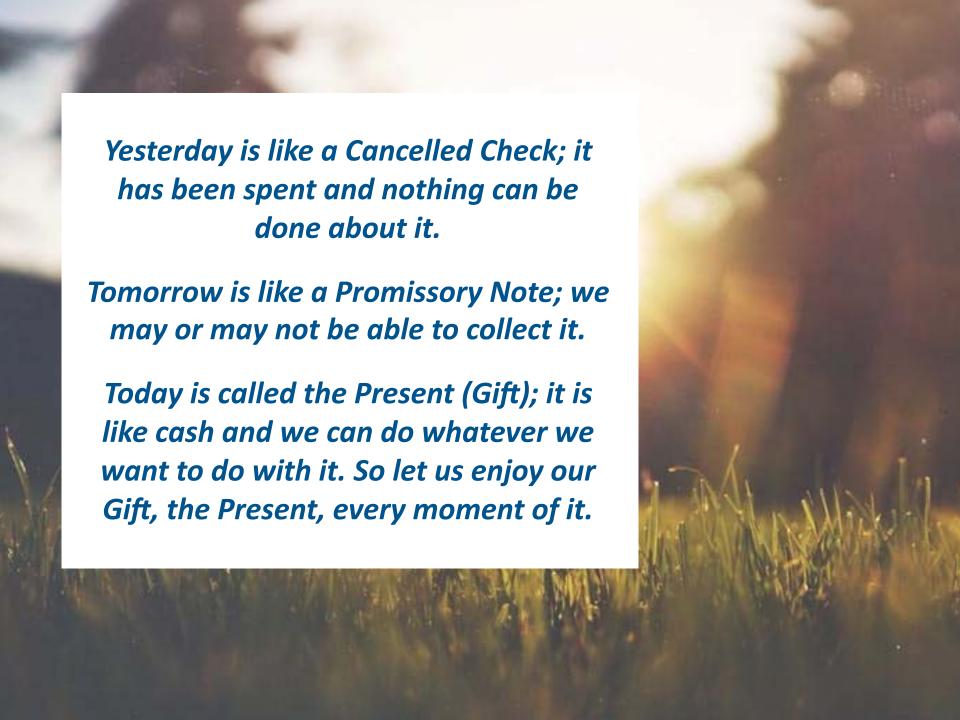




Krishnan Suthanthiran has established a division under BCF called "3E – Education, Empowerment and Equality" to promote the development and advancement of women. It is his belief that every man and woman was given birth to, nursed, and nourished by women, and therefore, they share a greater responsibility in juggling career and family, in raising children and caring for the home. In memory of his mother, Krish is proud to support women around the world in pursuing their goals through the 3E organization.







Best Cure Foundation's aim is to:

- Reduce the cost of healthcare worldwide by 30 percent or more
- Launch the Best Cure Total Health™ Program
- Increase transparency through Best Cure Proactive Healthcare™





Best Cure Foundation's aim is to:

• Establish:

- Express/mobile clinics and medical centers as non-profit, private, non-governmental organizations that are self sustaining
- Best Cure U.S. Health Corps
- Best Cure International Health Corps
- Best Cure Global Institute
- Best Cure Global Standard of Care
- Best Cure Global Purchasing Organization
- Best Cure Global Insurance





BEST CURE FOUNDATION's GOALS





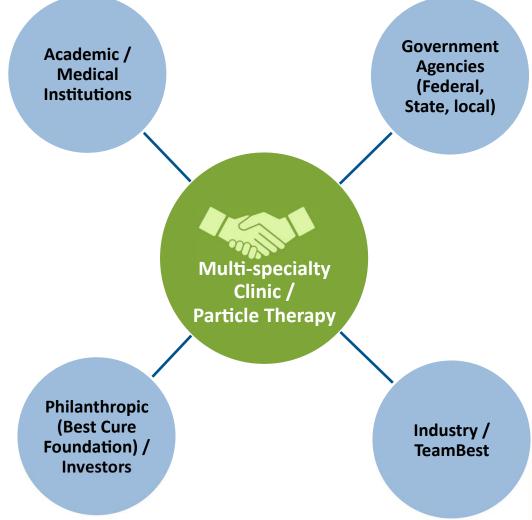








Public/Private Partnership Funding Model









Emergency Area and Operating Room





Physicians Scrub Room and ICU





Lobby and Lab





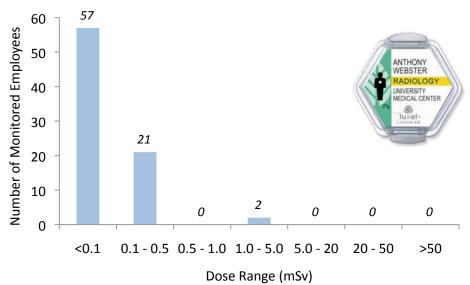
Best TheratronicsExternal Beam Therapy & Accessories



Dose Monitoring at Best Theratronics

BTL monitors workers who have a *reasonable probability* of **exceeding** the **1 mSv per year** dose limit set for the general public by the Canadian Radiation Protection Regulations.

Whole Body Dose Distribution (2017)



Example job tasks:

- QC testing of all devices containing radioactive material
- Manufacturing of blood irradiators
- Shipping and receiving radioactive material
- Tasks requiring access to controlled areas

| Dose (mSv) | Examples |
|------------|--|
| 0.1 | Typical chest x-ray |
| 0.47 | Highest <i>Best</i> manufacturing dose in 2017 |
| 1 | Regulatory limit for public dose |
| 1.8 | Dose from natural background radiation in Canada |
| 5.3 | Highest <i>Best</i> service technician dose in 2017 |
| 7 | Typical chest CT scan |
| 20 | Regulatory limit for occupational dose (averaged over 5 years) |
| 50 | Regulatory limit for occupational dose in any one year |

ALARA Exposure

ALARA – As Low As Reasonably Achievable

Radiation protection assessments, consisting of monitoring for contamination and radiation surveys, are completed regularly to ensure the safety of our employees and the public.



Contamination checks:

- When radioactive shipments are received
- Following movement of material throughout the facility
- Monthly, in areas where contamination may be found
- * No contamination events have occurred in recent years

Radiation Surveys:

investigated.

- Prior to shipping radioactive material, for driver's safety
- Monthly, in and around radioactive material storage areas
- Radiation exposure levels in non-controlled areas are minimal.
 Readings greater than 0.1 mR/h in uncontrolled areas are further

Environmental Monitoring

BTL manufacturing operations do not produce airborne or liquid radiological releases to the environment.

- Manufacturing operation emission concentrations are below regulatory limits as concluded from an emissions analysis conducted in 2013.
- All radioactive material are contained in welded stainless steel double encapsulation and stored within certified transport containers.
- All aspects of BTL's operations that may have an impact on the environment are identified, evaluated, recorded and reviewed periodically.
- Best Theratronics has established a waste management program to promote the safe handling and disposal of hazardous and non-hazardous waste generated from its operations.



GammaBéam)_m saving lives

Evolution of Radiation Therapy – Cobalt-60

Cobalt 60 widely used for conventional RT in most of the world.

But..

Has lacked the required technical R & D to facilitate IMRT/IGRT...

UNTIL NOW



GammaBeam™ 300 Equinox™ External Beam Therapy System



The GammaBeam 300
Equinox's advanced
design provides freedom
in treatment planning and
can interface to all of the
major record and verify
systems to allow for rapid
treatment parameter
loading, treatment set up
verification, and the
recording of the delivery.



GammaBeam[™] 100-80 External Beam Therapy System



The GammaBeam[™] 100-80 is a highly practical model of the GammaBeam family of External Beam Therapy System (EBTS). Convenience and safety, combined with simplicity of design, make it easy to use and easy to maintain.



Motorized and Manual Multi-Leaf Collimators



Multi-Leaf Collimators now available as an optional accessory for the Equinox and GammaBeam 100-80 product line, providing 3D Conformal Radiation Therapy (3D CRT) and Intensity

Modulated Radiation Therapy (IMRT) capability.

GammaBeam[™] 500 Total Body Irradiator



The Total Body Irradiator
GammaBeam 500 is a
teletherapy unit designed to
produce a large fixed rectangular
radiation field at an extended
source-to-skin distance in order
to deliver total body irradiation.
Used in preparation of bone
marrow transplantation.



nomosSTAT™ Serial Tomotherapy



nomosSTAT[™] serial tomotherapy delivery technology fires pencil beams from a continuous 340 degree arc around the patient, creating a highly conformal dose distribution.



GammaBeam[™] 200 Research Irradiator



The GammaBeam 200 (GB200) is among the most versatile research irradiators available today. Suited to a broad spectrum of applications including secondary standards dosimetry, sterile insect programs, and medical or veterinary research, the unit provides your lab with a powerful tool.

Blood Irradiation - Raycell[®] Mk2



Treatment of Graft-Versus-Host Disease (TA-GVHD) is almost always ineffective, and therefore management must focus on prevention by minimizing the risk of developing the condition. Blood irradiation using the Raycell® Mk2 uses two opposing x-ray tubes to deliver superior uniform dose.



Blood Irradiation – GammaCell® 1000/3000



Blood irradiation using Caesium¹³⁷ available with the **Gammacell® 1000/3000** for superior performance and unparalleled dose uniformity





Best Theratronics Ltd Machine Shop, Ottawa, Canada

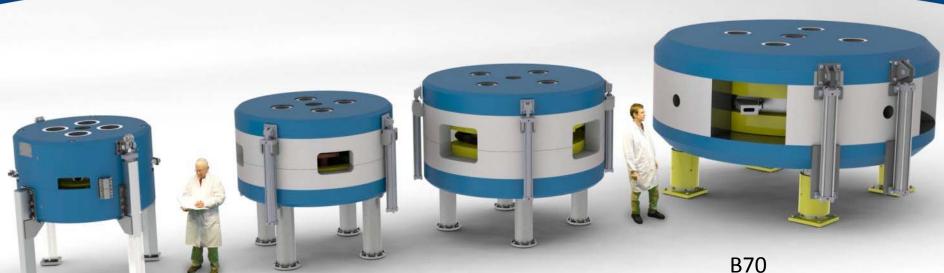


Best Theratronics Ltd Assembly Hall

Best Cyclotron Systems For Research & Radioisotope Production



TeamBest® Cyclotron Designs



B15 PET

15 MeV

400 uA

Targets

Radiochem

B25

20-25 MeV

400 uA

Targets

Radiochem

B35

15-35 MeV

1000 uA

Targets

Radiochem

35-70 MeV

1000 uA

Targets

Radiochem



Best Cyclotron Systems

| Cyclotron | Energy (MeV) | Isotopes Produced |
|---------------------------|-----------------|--|
| Best 15 | 15 | ¹⁸ F, ^{99m} Tc, ¹¹ C, ¹³ N, ¹⁵ O, ⁶⁴ Cu, ⁶⁷ Ga, ¹²⁴ I, ¹⁰³ Pd |
| Best 20u/25 | 20, 25–15 | Best 15 + ¹²³ I, ¹¹¹ In, ⁶⁸ Ge/ ⁶⁸ Ga |
| Best 30u (Upgradeable) | 30 | Best 15 + ¹²³ I, ¹¹¹ In, ⁶⁸ Ge/ ⁶⁸ Ga |
| Best 35 | 35–15 | Greater production of Best 15, 20u/25 isotopes plus ²⁰¹ TI, ⁸¹ Rb/ ⁸¹ Kr |
| Best 70 | 70–35 | ⁸² Sr/ ⁸² Rb, ¹²³ I, ⁶⁷ Cu, ⁸¹ Kr + research |

Best Cyclotron Systems provides 15/20/25/30/35/70 MeV Proton Cyclotrons as well as 35 & 70 MeV Multi-Particle (Alpha, Deuteron & Proton) Cyclotrons

- Currents from 100uA to 1000uA (or higher) depending on the particle beam are available on all BCS cyclotrons
- Best 20u to 25 and 30u to 35 are fully upgradeable on site



Best Cyclotron Systems



Assembly of a
Best 35 MeV
Cyclotron
at Best
Theratronics
facility, Ottawa,
Ontario, CA



Best Cyclotron Systems



Installation of Best 70 MeV Cyclotron at Italian National Laboratories (INFN), Legnaro, IT



Installation of 70MeV Cyclotron May 2015 - Legnaro, Padova, Italy



Installation of 70MeV Cyclotron May 2015 - Legnaro, Padova, Italy



Inauguration of 70 MeV Cyclotron at INFN December 2016 - Legnaro, Padova, Italy



Front Page News in Padova, Italy

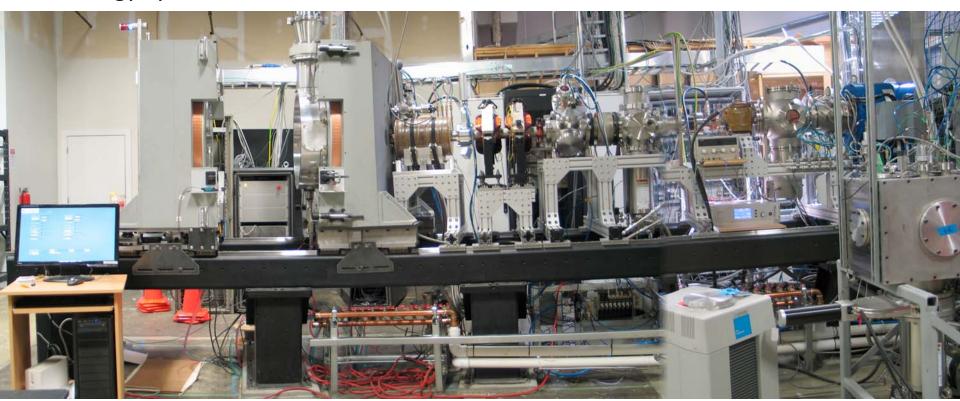


70 MeV Cyclotron at INFN



Best Cyclotron Systems Test Stand Facility

Operating a Test Stand facility for Ion Source and Injection Line studies and development. Versatile 1MeV center region magnet configurable for our energy cyclotrons.

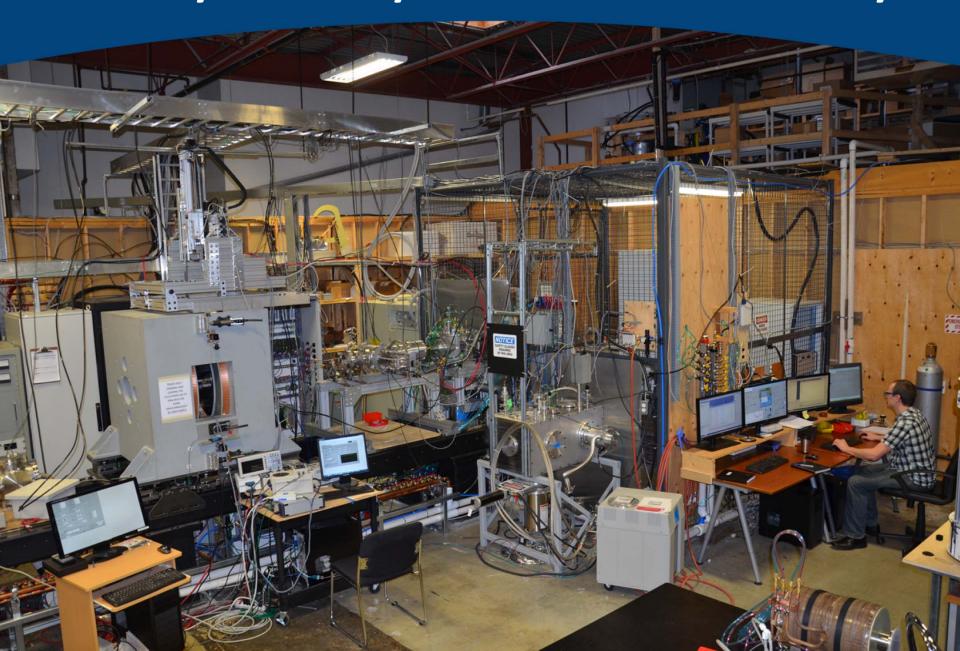


Cooperation with INFN and MIT for Cyclotron injection test of high intensity H_2 + beam. (Paper WEPPT026, Proceedings of the 20th ICCA 2013, Vancouver, Canada)

Best Cyclotron Systems Test Stand Facility



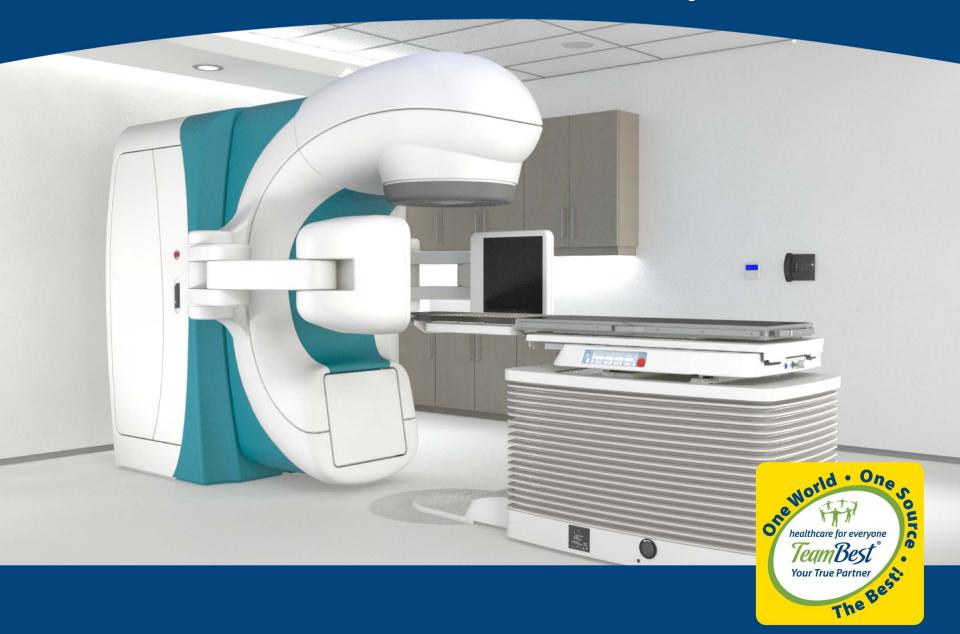
Best Cyclotron Systems Test Stand Facility



Exciting New Products Under Development

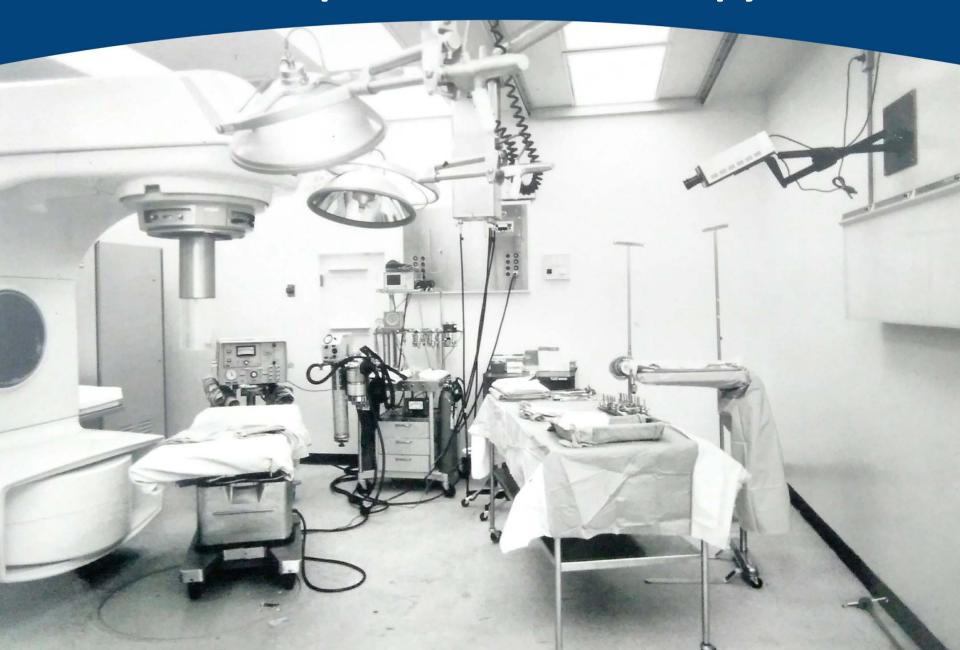








Intraoperative Radiotherapy



Intraoperative Radiotherapy









Best Particle Therapy ion Rapid Cycling Medical Synchrotron (iRCMS)



Collaboration with the Best in the World

In 2009, Best Medical International (BMI) and Brookhaven National Laboratory (BNL) signed an agreement called CRADA (Cooperative Research And Development Agreement)

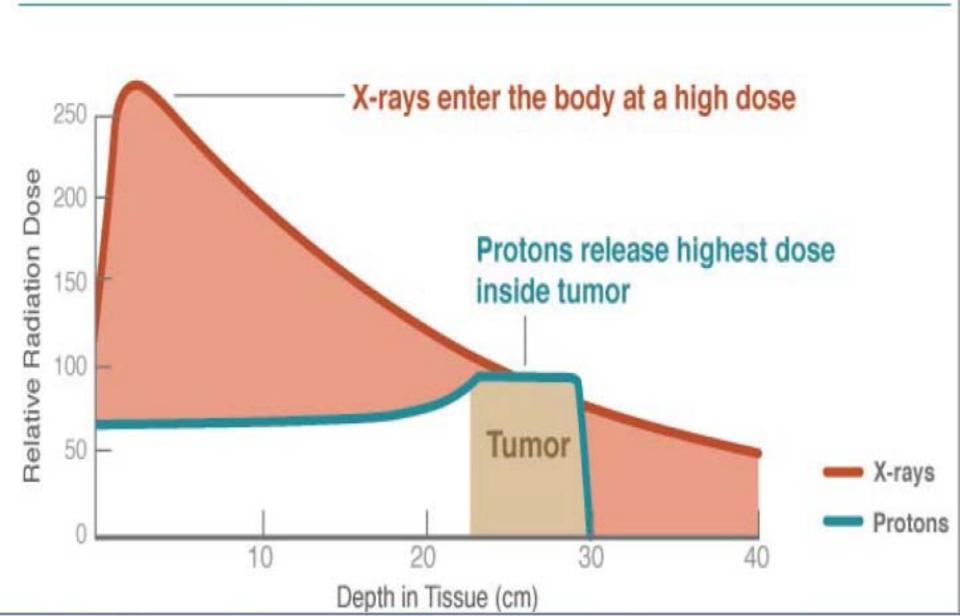
The mandate was to develop an ion Rapid Cycling Medical Synchrotron (iRCMS)



BNL (USA) Particle Accelerators 0.75 MeV to 250 GeV

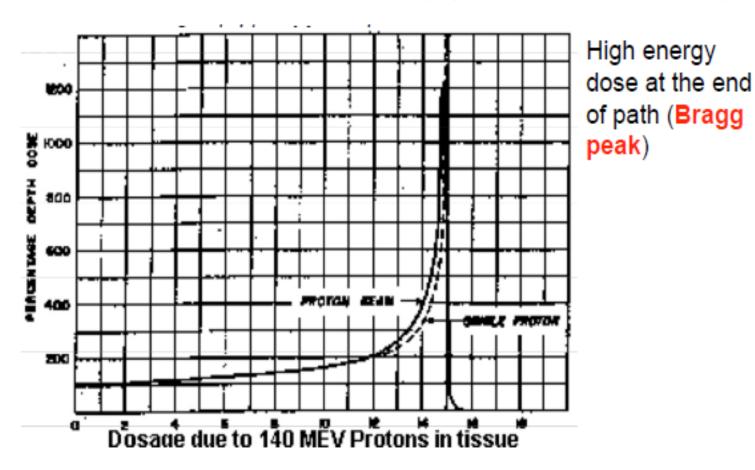


Proton therapy precisely targets tumors, reducing the radiation dose to healthy tissue compared with X-rays¹



1946 "Radiological Use of Fast Protons" and discovery of the Brag Peak

ROBERT R. WILSON Research Laboratory of Physics, Harvard University



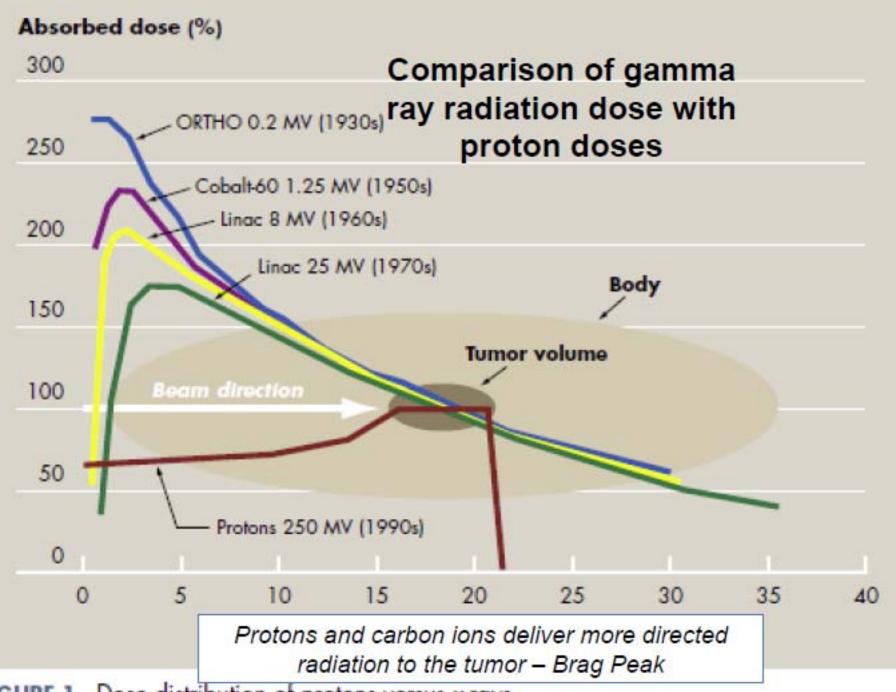
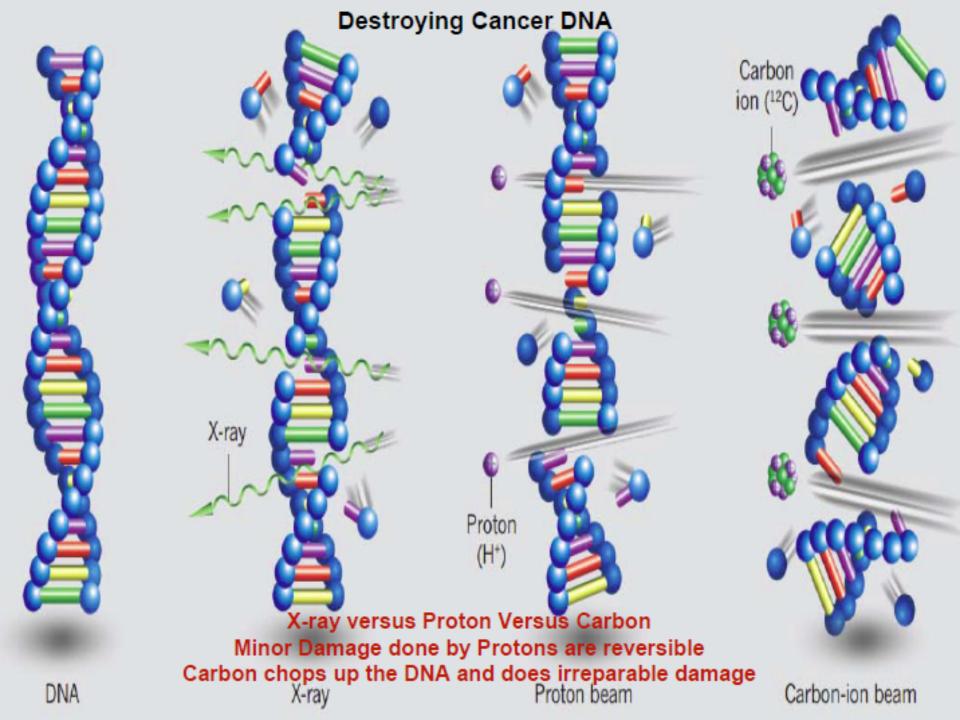
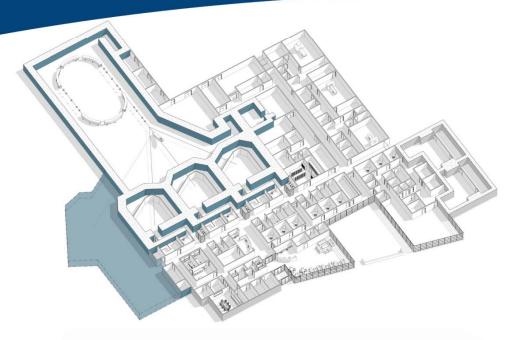
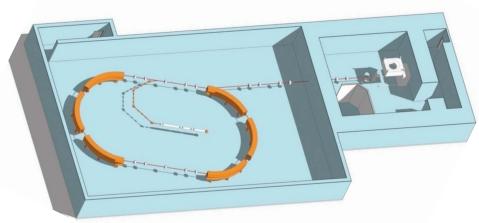


FIGURE 1 Dose distribution of protons versus x-rays.



Expandable from Single-Room to Multi-Room

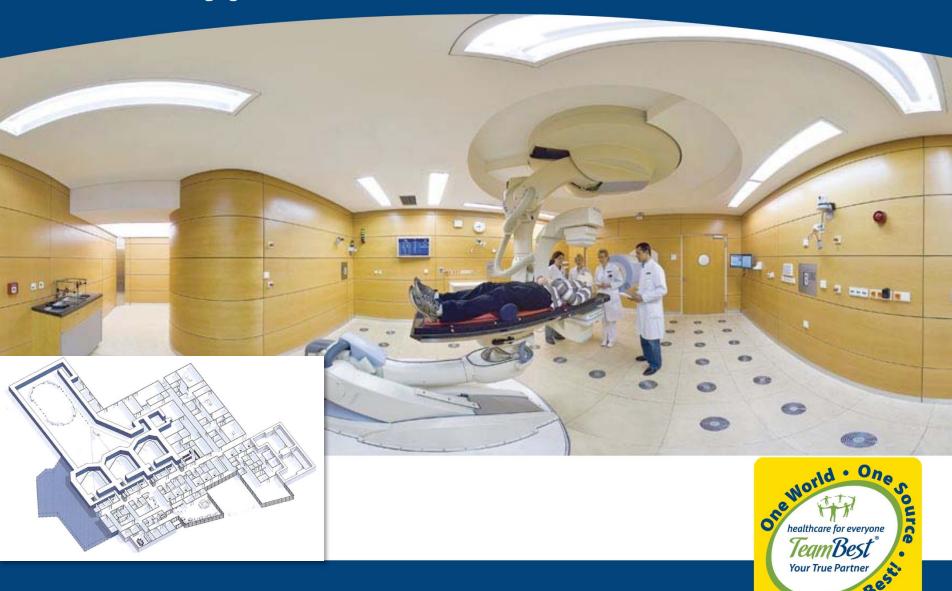




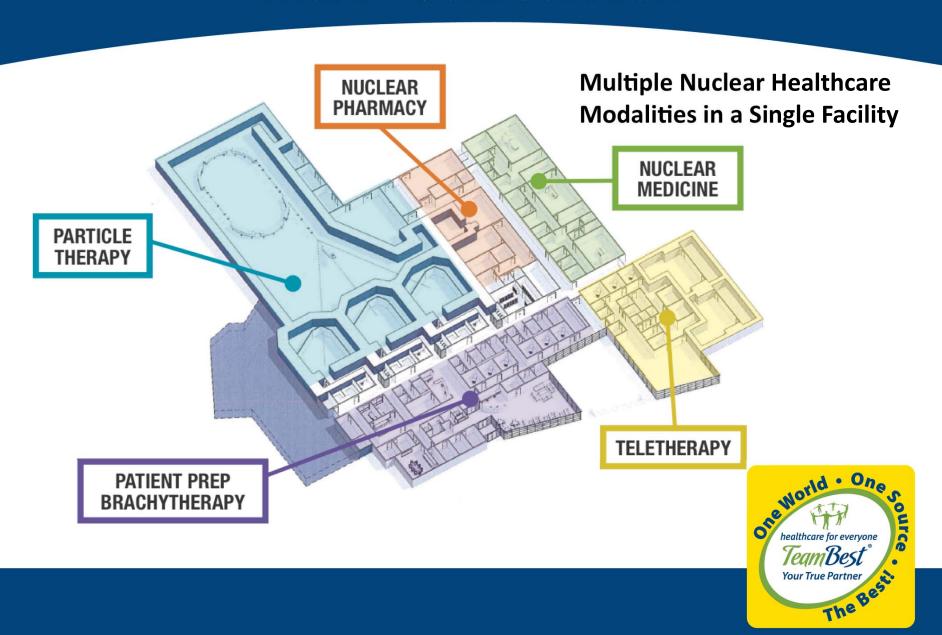
400 MeV Rapid Cycling Medical Synchrotron for Proton-to-Carbon Heavy Ion Therapy:

- Intrinsically small beams facilitating beam delivery with precision
- Small beam sizes small magnets,
 light gantries smaller footprint
- Highly efficient single turn extraction
- Efficient extraction less shielding
- Flexibility heavy ion beam therapy (protons and/or carbon), beam delivery modalities

Typical Treatment Rooms



Multi-Room Solution





Single-Room Solution

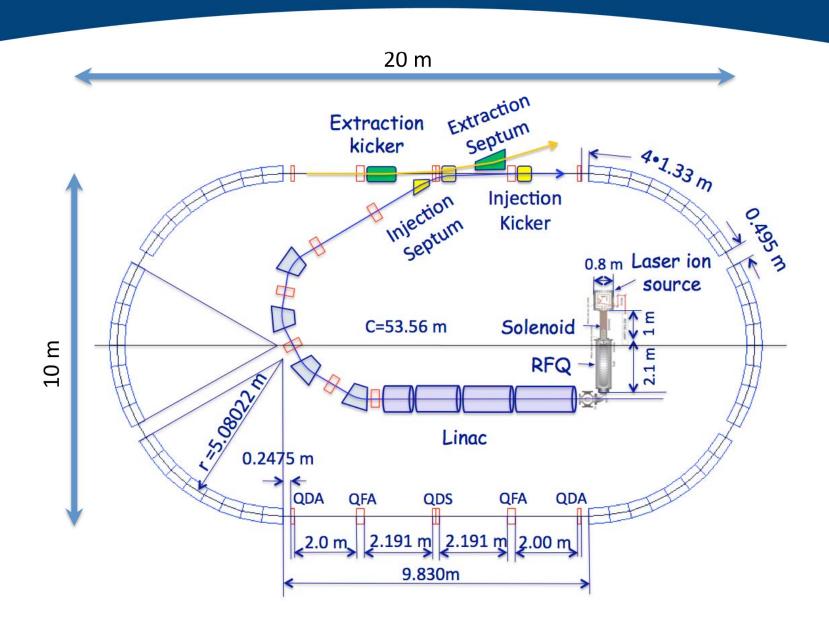




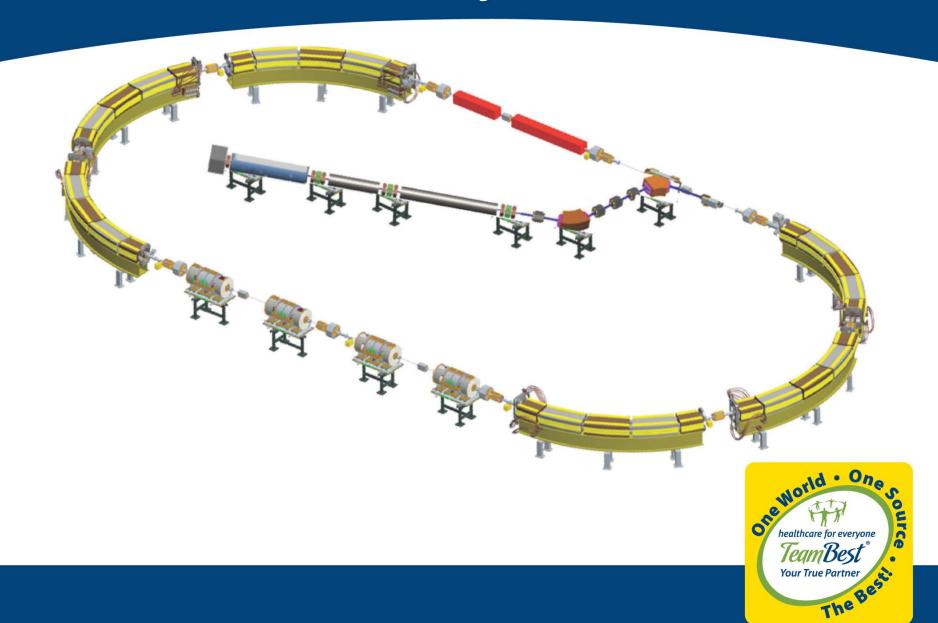




BEST / BNL iRCMS – Much Smaller Footprint



Racetrack Synchrotron



Shielding Estimate Comparisons

| | Accelerator Comparison Table | | | | | | |
|--|------------------------------|----------------------------|-----------------------------------|---------------------------------|-----------------------------|---|--|
| | | | | | | Maximum Credible Incidence (MCI) | |
| | | Energy Maximum (MeV) | Avg. Current Delivered (nA) | Charge Accelerated (nC/s) | Risk Ratio MCI/Delivered | Shielding (50 mSv/yr) Concrete @10.00 m (m) | |
| | Protons (206 MeV) | | | | | | |
| | Isochronous Cyclotron (NC) | 230 | 2 | 1250 | 625 | 2.89 | |
| | Isochronous Cyclotron (SC) | 250 | 2 | 313 | 156 | 2.44 | |
| | Synchro Cyclotron (SC) | 250 | 2 | 1 | 0.50 | 0.54 | |
| | Slow Cycle Synchrotron | 250 | 2 | 20 | 10 | 1.53 | |
| | Rapid Cycle Synchrotron | 1200 | 2 | 0.133 | 0.067 | 0.13 | |

<u>Estimates above</u> were calculated using the Moyer Model Neutron source terms for 177 MeV protons Neutron transmission factors Neutron attenuation length in concrete (SLAC PUB 130339)

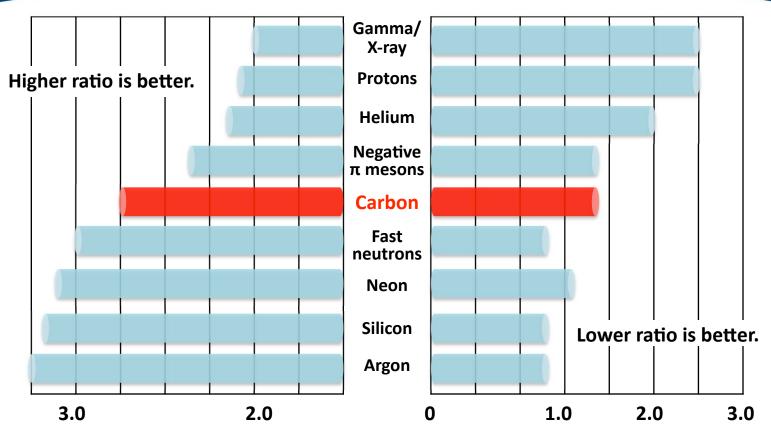
<u>Final shielding calculations</u> use a full scale Monte Carlo method (MCNPX, GEANT, FLUKA)



Prototype iRCMS Combined Function Magnet



RBE: Relative Biological Effectiveness OER: Oxygen Enhancement Ratio

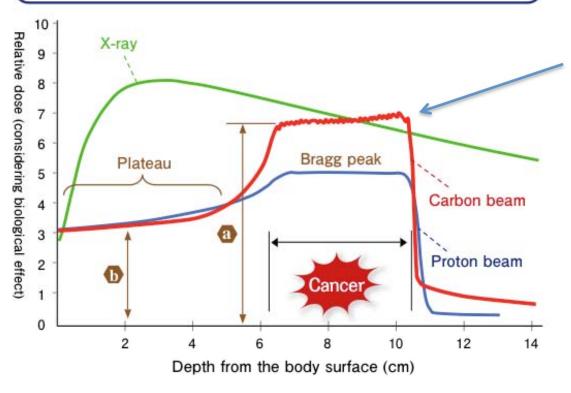


RBE represents the biological effectiveness of radiation in the living body. The larger the RBE, the greater the therapeutic effect on the cancer lesion.

OER represents the degree of sensitivity of hypoxic cancer cells to radiation. The smaller the OER, the more effective the therapy for intractable cancer cells with low oxygen concentration.

Clinical Comparison: X-rays vs. Protons vs. Carbon lons

When the ratios of peak to plateau (a/b) are compared while considering biological effect, the carbon beam has the largest value.

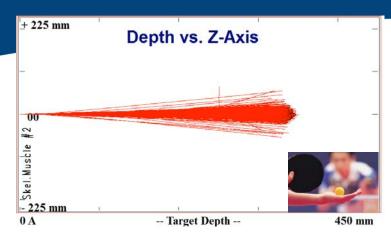


Spread out the Bragg Peak to match tumor volume

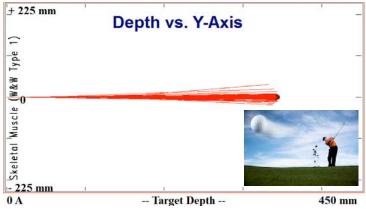
Protons - Base/Peak = 60% Carbon Ions - Base/Peak = 45%



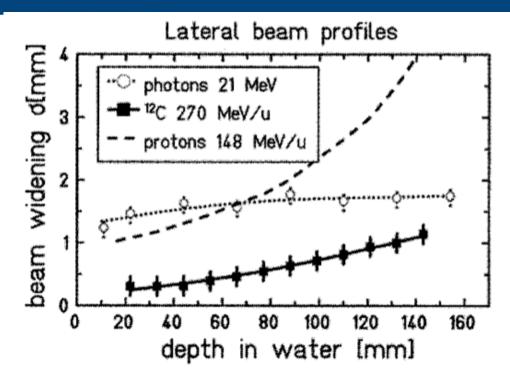
Carbon Ions are more precise than Protons



The intrinsic spot width for ~206 MeV/u protons is $2\sigma = 11.4 \text{ mm}$



The intrinsic spot width for ~400 MeV/u carbon ions is $2\sigma = 2.93$ mm



"Lines to guide the eye" U. Weber GSI (1996)



Cost of facilities construction and operation

Superior dose depth distribution

Physical beam characteristics

- Higher LET
- Superior RBE
- Lower OER
- Narrow penumbra

Radiobiological considerations

- Hypoxia
- α/β ratio
- Metabolism
- Micro-environment
- Cancer stem cells

Considerations for implementing new carbon ion therapy facilities

Relationship to critical structures

- Dose limitations
- Toxicity

Therapeutic gain for specific histologies

- Local control and survival
- Historical responsiveness to current radiotherapy

Dosage and treatment planning

Patient convenience



Medical Advantage

- Deliver 20 times the cancer killing power of protons
- Cure the patient 4 to 10 times faster

Benefit to Patient

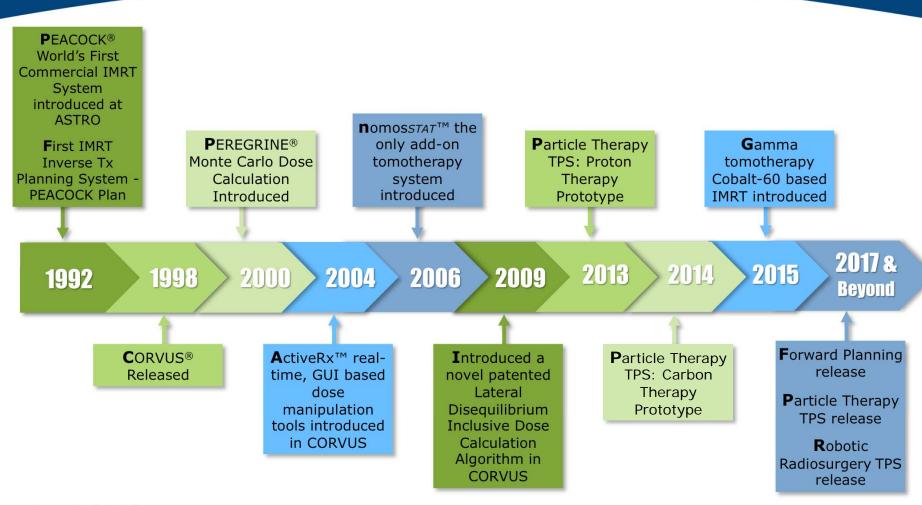
- Shorter treatment times potentially 4 to 10 times less
- Less stress for the patient physically, emotionally & financially
- Less unnecessary radiation exposure

Benefit to Society

 A Heavy Ion Center will provide maximum advantage to the general public by having the capability to treat many more patients than a Proton Center with the same number of treatment rooms

Best Supplies Proton Systems Upgradeable to Carbon!

TREATMENT PLANNING SYSTEM



Particle Therapy:

- Proton and Carbon with Best's Rapid Cycling Synchrotron (collaboration with BNL)
- Algorithm verification in collaboration with MGH

Summary

BMI & BNL have jointly developed a rapid cycling proton/carbon synchrotron that enables advanced features including:

- A unique combination of advanced spot scanning with rapid energy modulation
- Elimination of neutron contamination associated with patient specific hardware

Rapid cycling technology has several natural advantages:

- Intrinsically small beam emittances facilitating beam delivery with unprecedented precision
- Small beam sizes small magnets, light gantries smaller footprint
- Highly efficient single turn extraction
- Efficient extraction, less charge per bunch less shielding
- Flexibility protons and or carbon, future beam delivery modalities



State of the Art Manufacturing Facilities



Exhibitions, Meeting & Trade Shows



AAPM 2016 – Washington, DC



AAPM 2016 – Washington, DC



ASTRO 2016 – Boston, MA



ASTRO 2016 – Boston, MA



ICC 2017 Best Exhibitor Award



Team Best won the
Best Exhibitor Award
at the 2nd Indian Cancer
Congress 2017
Bangalore, India



Recent Recognition



Keynote Speaker – Global Health Catalyst Cancer Summit

April 29, 2016, Harvard Medical School, Boston, MA



Power of One Award - Patcha Foundation

October 29, 2016, Laurel, MD





International Man of the Year Award –U.S. Congressman Danny K Davis's Multi Ethnic Advisory Task Force

October 30, 2016, Meadows Club, Rolling Meadows, IL





Fastest Growing Indian
Company Excellence Award

10th International Achievers
Summit on Global Corporate
Achievements & Social
Responsibilities

Friday, April 20, 2018 Bangkok, Thailand









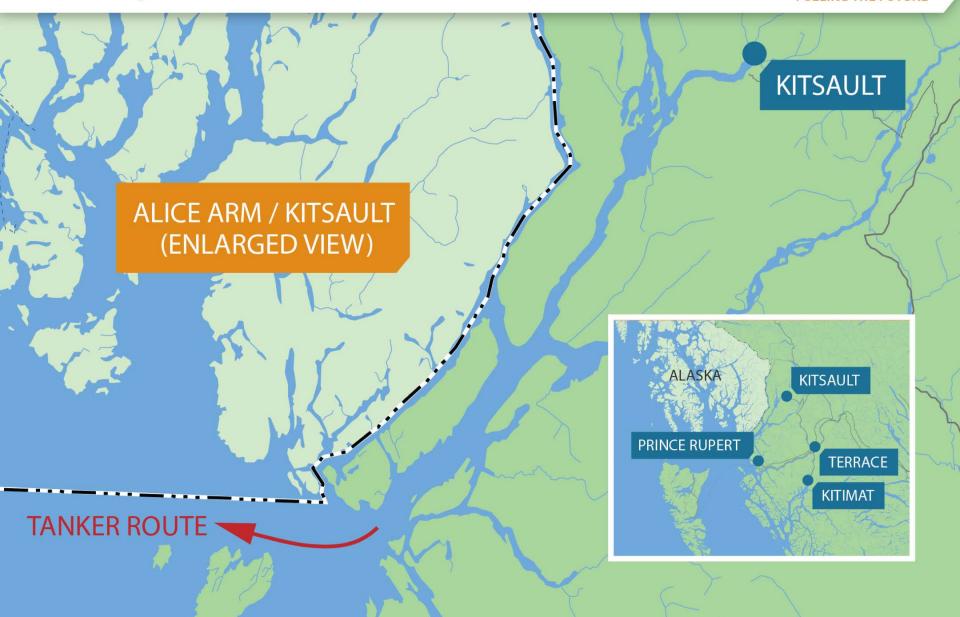






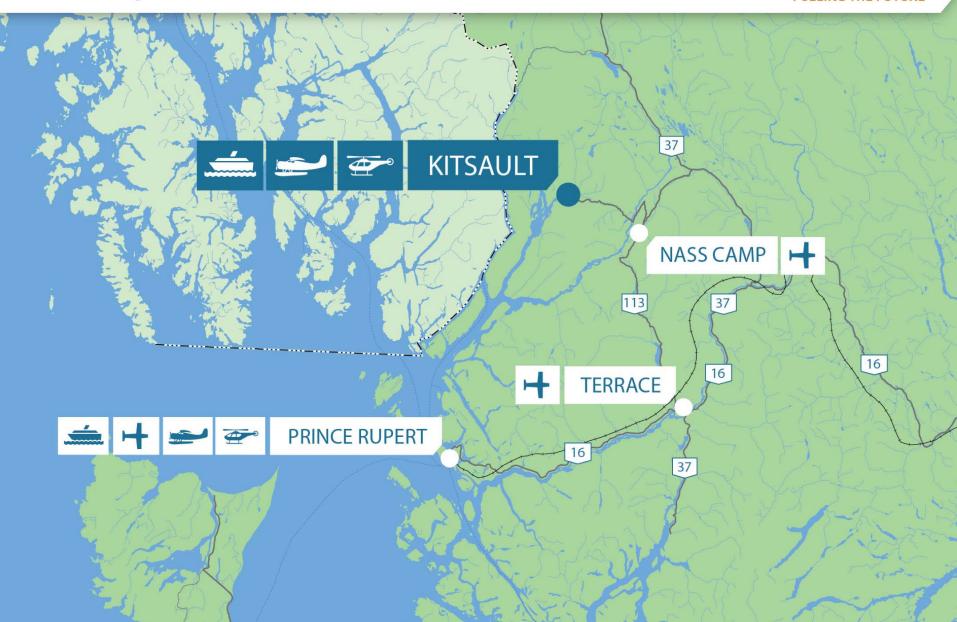
















EXISTING HOUSING INFRASTRUCTURE:

SINGLE FAMILY HOMES

 95 THREE BEDROOM HOMES AVAILABLE.

APARTMENT BUILDINGS

 150 TWO AND THREE BEDROOM APARTMENTS AVAILABLE.

FUTURE DEVELOPMENT

- 30 BUILDING FOUNDATIONS ALREADY IN PLACE.
- VACANT LAND THE POTENTIAL DEVELOPMENT OF PRIME OCEAN AND MOUNTAIN VIEW LOTS.







COMMUNITY INFRASTRUCTURE:

RECREATION CENTRES

- THE 25,000 SQUARE FOOT COMMUNITY CENTRE.
- FOUR SHEET CURLING RINK, MOVIE THEATRE AND A PUB.

SHOPPING CENTRE

 22,000 SQUARE FOOT SHOPPING CENTRE WITH A GROCERY STORE, BANK, AND POST OFFICE

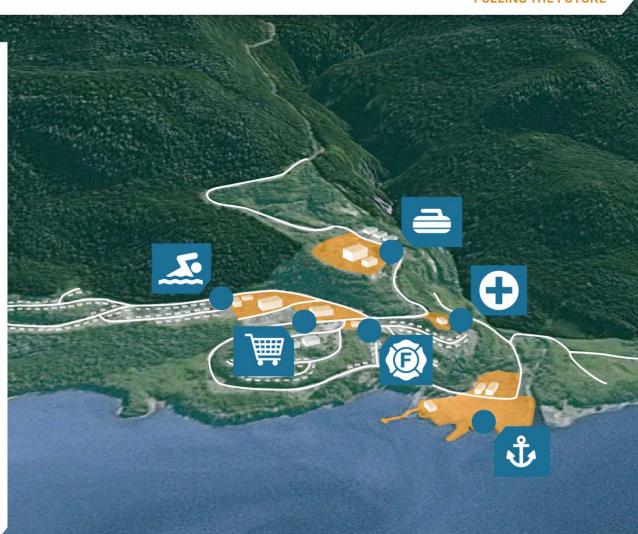
EXECUTIVE HOUSE

 VIP GUEST HOUSEWITH 4 BEDROOMS, 5 BATHROOMS AND A BOARDROOM.

MEDICAL CENTRE

FIRE HALL

INDUSTRIAL BUILDINGS









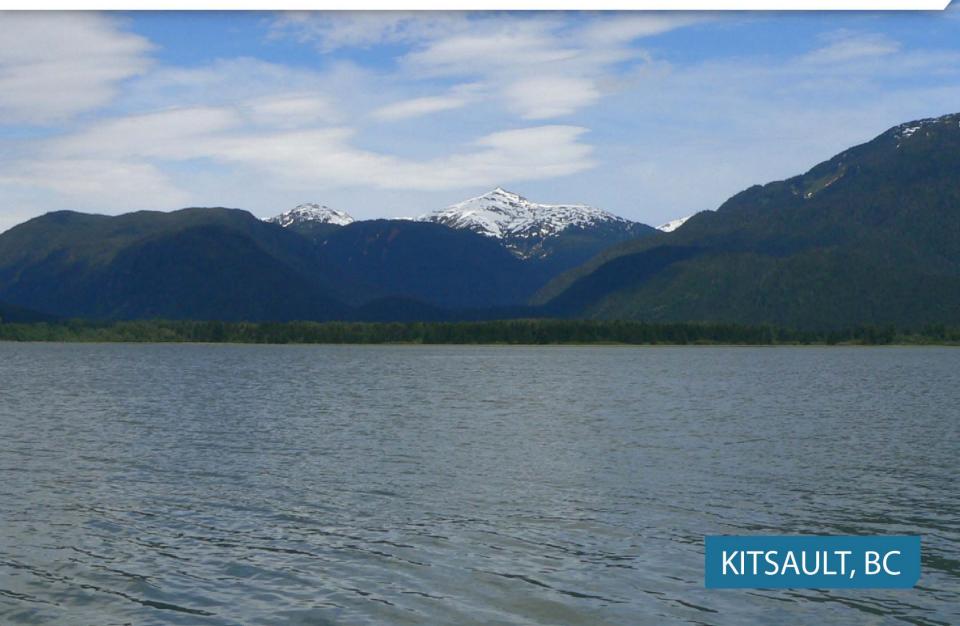






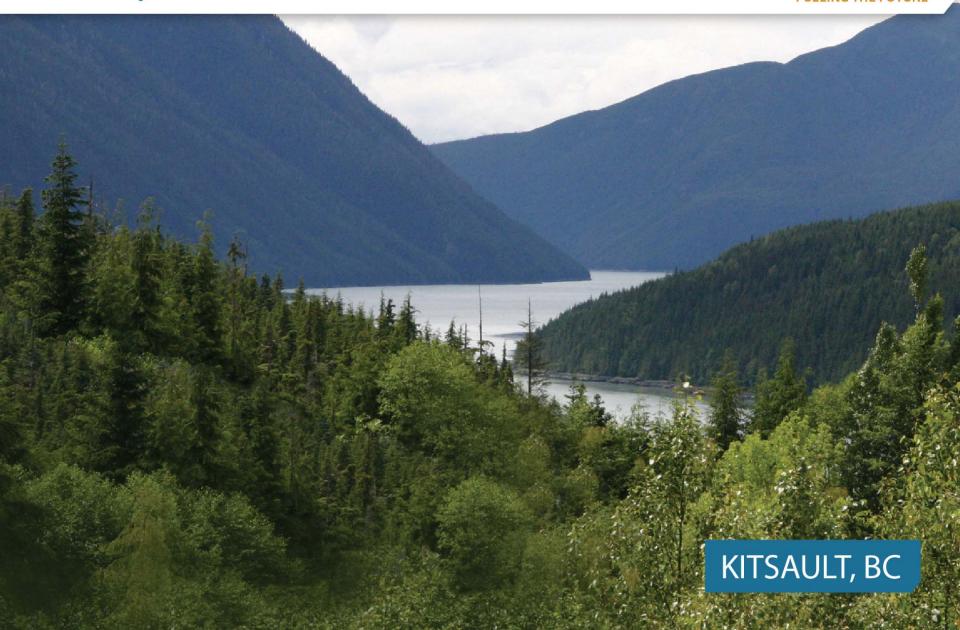












Happy Mothers' Day!

Sunday, May 13th is Mothers' Day in North America.

Many of you will be celebrating and thanking all of your mothers.

I lost my mother 36 years ago and still it is a big loss. Every man and woman including the greatest Men and Women were given birth to, nursed, nourished and raised by women.

Women, often share a larger burden of raising families, doing household chores/cooking/cleaning, taking care of the "Adult Child" (Husband) sometimes, while juggling a full/part-time professional career.

A big thank you all the mothers of this world – for their hard work and sacrifices in raising all of us.

Best wishes and a very Happy Mothers' Day!



