

**2018/2019 Global Health Cancer Research and Education in Radiotherapy (CaReER)  
certificate program**

## **An Introduction to Affordability of Better Value Clinical Oncology**

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**[www.icedoc.org](http://www.icedoc.org) & [www.icedoc.org/winwin.htm](http://www.icedoc.org/winwin.htm) & [www.icedoc.net/winwin.htm](http://www.icedoc.net/winwin.htm)**

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**Date 8 September , 2018**

- **This lecture is a part of the online 2018/2019 Global Health Cancer Research and Education in Radiotherapy (CaReER) certificate program**

**Global Radiation Oncology Certificate,  
Harvard Global Health Catalyst, Director**

**Date September 8, 2018**

**Disclosure of interests: None.**

**What I present today is not only on my behalf (Ahmed Elzawawy) but, it represents the Win-Win Initiative of Harvard Global Health Catalyst Hence , it is Hand in Hand with :**

**Prof. Wil Ngwa , Director of Harvard Harvard Global Health Catalyst GHC & Prof. Paul Nugyen : Co-chairs of Harvard Global Health Catalyst GHC & Prof. David Kerr,( Oxford University, UK and Win-Win ), Prof. Eduardo Cazap ( Argentina, SLACOM and Win-Win ), Pof. Twalib Ngoma, (Tanzania and Win-Win), Prof. Riccardo Audisio (Sweden and Win-Win),Prof. Nicholas Abinya(Kenya and Win-Win)& Prof. Luca Incrocci ( Netherlands & Win-Win) & Coordinators of Harvard GHC programs: Dr. Credit Omoruyi & Dr, Lydia Asana & Dr. Neeharika Sinha.**

**Once again, The Win-Win will continue and succeed only with the contribution of many!.**

**The Win-Win belongs to all!**

In this lecture I stress on exploring some positive and constructive points to increase affordability of better radiation-clinical oncology in the world starting from LMICs and Africa.

This could be realized by different stakeholders . But, You, dear colleagues everywhere are the doers and you are fundamental to realize remarkable improvement.

It needless to repeat here detailed data and charts that -you all know- about the tragic lack of radiation oncology in the world and particularly in Africa.

**We can't claim that any course or certificate would present all knowledge.**

**We particularly in this lecture aim at presenting stimulating points to participants rather than trying the impossible to cover all points in some lectures.**

**This approach fits more our objective to count on all of you to explore and to realize by all classic and innovative Scientific approaches how to increase the affordability of better value Clinical Oncology care in your community.**

Here are some questions and answers that I don't hesitate to declare them along the Win-Win presentations and approaches:

**Q: Why Radiotherapy is in the heart of Clinical Oncology?**

- Surgery and radiotherapy are responsible for the majority of cure and treatment of cancer.

( Cancer Atlas, 2014)

- 50-60 % of cancer patients are in need to radiotherapy along to the course of their disease.

- Radiotherapy is **Cost Effective** (Many references.) We can't compare the high cost effectiveness of Radiotherapy to Skyrocketing increase in cost of novel cancer without evidence of matching increase in outcome.

( We present along this lecture some links to our publications and presentations about better value **cancer drug therapy**

[www.icedoc.net/winwin.htm](http://www.icedoc.net/winwin.htm)

There is also, in the course there special lectures By Prof. R. Audisio about **Principals of Surgical Oncology**)

**Needless to repeat in all occasions, for many years the details of what we all know without making real progress in solutions :**

- It can be estimated that, at present, 60% to 70% of Cancer patients in the world have no access to any chemotherapy at all. The percentage is higher for radiotherapy.**
- The picture is more tragic in Africa as only 5% of Cancer patients have access to Radiotherapy !. No any Radiotherapy services in more than 25 countries (Total 53 countries)**

**Q: Is the educational information and training and their different scopes in the field of clinical oncology - radiotherapy should be less for LMICs than affluent countries?**

**My answer is : No...No....No!**

**Clinical Oncologists and Physicists in LMICs face more challenges and varieties so they should know more options , hence to manage daily practice without compromising the outcome as they can. Also, having knowledge and skills to innovate and search would be a mean to overcome problems and to improve outcome in the future...hence all would win!!**

**Q: But , the affordability you mean seems to be a far objective. it is very big. The gap is horrible...We heard a lot ...but the gap is increasing.!**

**My answer: The points you cited are powerful reasons to call you all to concentrate efforts in Win- scientific approaches that consider the real incentives of all stakeholders in the real world. There is no organization or society or University in the world that could really do! But they can assist a lot. But , you all, with engaging all stakeholders in smart and scientific approaches that consider the interests and incentives of all can do a lot.**

**It is not a romantic talk. But it needs a lot of education, training, work and focused researches and scientific evaluations. All would Win!.**

**Q: Simple question: Is that this educational lecture and course has other objectives than education and training!!!?**

**But, my more direct Answer is : Education and training is a tool or a mean and not an objective. Particularly in this lecture we aim that you go out with provocative and stimulating points that would increase your curiosity and wil to serve the cause of presenting reasonable clinical oncology services to our patients everywhere via your progress in your professional career, knowledge, skills attitudes and researches .**

**Q- Are the questions and scientific efforts to increase affordability of better value cancer care are relevant only to LMICs? In other words: is the Win-Win initiative is for the sake of cancer patients and progress of the cancer care professions and career in LMICs only?**

**My answer is: No!. The problems of lack affordability of cancer care and clinical oncology services are much more tragic in LMICs and particularly in most of African Countries. But , the skyrocketing rise in costs of cancer care put increasing pressure on the present and future affordability of treatment in the affluent countries. This happens while there is no real scientific evidence that there is improvement in outcome to patients that commensurate of the rapid rising of costs. That is to say there is rising question about the “Value of care and to How get better value cancer care”. Otherwise, The Whole system may collapse!. The notions of The Win-Win initiative considered the interests all stakeholders, cancer patients everywhere, cancer care professionals, Governments , Manufacturers of Medical devices and pharmaceuticals and The welfare of societies and economies. Starting from Africa and other LMICs will be beneficial to the whole world.**

**Q: Why there is a component to stimulate conducting researches in this lecture and in this Educational course in general?.**

**My answer : Conducting scientific researches is an important element to improve the current practice and to solve problems cancer care in LMICs, to make progress in the career of local cancer care professionals and to increase the contribution of the local cancer care professions in the international scientific progress in order to be an essential part of the international scientific community while they are serving local patients at homelands hence to decrease brain drain.**

**Ref: Elzawawy AM: Could African and Low- and Middle-Income Countries Contribute Scientifically to Global Cancer Care? JGO – Journal of Global Oncology Volume 1, Issue 2, December 2015**  
**<http://jgo.ascopubs.org/content/1/2/49>**

Q: Are you going today to give us lessons?

My answer is No!. But to raise some points and examples , then hopefully , we will continue the long journey together.

N.B. You notice that my slides are full of text and not just phrases. So, you will have access to most of my talk today if you download a copy of the presentation.

Keep the line of communications and discussion opened in the future as our time allows

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- **The pharmaceutical companies are developing increasingly expensive novel cancer drugs with no indication that the rapidly increasing expenses will be lessened in the future, The overall disease-free survival rates are not increasing in a measure commensurate with the rising curve of expenses of cancer treatment.**
- **The major markets for the pharmaceutical industry and Radiotherapy are in the USA, Western Europe and Japan.**
- **If there are ways to broaden markets remarkably in the underserved regions in the world, then it will be beneficial to all stakeholders.**

- **In May, 2013, The World Health Organization (WHO) declared and published a global action for the prevention and control of non-communicable diseases for the next 7 years till the year 2020. This plan implies 80% affordability of essential cancer drugs and medicine by the year 2020 worldwide.**

(Collingridge D, Sullivan R (2014) Affordable cancer care: pipedream or achievable reality? Lancet Oncol 15(3): 257-258.)

- **Today in 2018, after 5 years of the 7 years plans, there is no sign of any remarkable progress toward achievement of this very needed objective. ( I can guess that many of you are saying ...No....No! )**

- **Despite** the several studies, reports, publications, commissions, resolutions , talks, some sporadic actions , conferences of international , regional or national organizations, societies , governmental or independent bodies and individuals , **the deficit** **between the demand of Radiotherapy –clinical oncology and the supply** **has widened** **in the last 10 years** in the Low and Middle income countries (LMICs)!!.

- In an article published in 2015 the contributors from different affiliations and including the IAEA replied a critical question about “Have we made a progress regarding global access to radiotherapy services in the past decade?”. They emphasized that it remains a deficit of more than 7,000 radiotherapy machines in the world and the gap between the required and the supply is rising particularly in LMICs.

Yap ML, Zubizarreta E, Bray F, Ferlay J, Barton M (2015) **Global Access to Radiotherapy Services: Have We Made Progress During the Past Decade?** Journal of Global Oncology 2(4): 207-215.

In the year 2012 It was estimated that at least **7,000 additional megavoltage radiotherapy machines** are presently needed worldwide and, **by 2020, at least additional 10,000 radiotherapy machines with establishment of clinical oncology services with affordable medical cancer care and drugs** may be needed to meet growing treatment demand.

**( The Harvest is plenty! The doers should make effective steps forward) . Hence, the issue is not about one center here or there , not about just few more machines established in some developing countries and not about spending years in big international organizations in questions like is it cobalt or Linac or what could be the package or component of a service!?).**

- If the movement continues in the same way of reports, conferences, commissions, task forces , that end with reporting the tragic situation and data, with calls and plans of actions to improve the picture by 2020 Or 2025 , but without focused and globally coordinated scientific works to explore unlimited approaches to resource sparing and cost effective care and with practical tactics that consider the incentives and interests of all stakeholders and mobilisation of every possible resources ; financial and human resources and allies in win-win scenarios that cope with the real world, then it is expected that the problem will tragically escalate in the upcoming 10 years **particularly in LMICs and more severely in Africa**.

- The Win-Win initiative [www.icedoc.org/winwin.htm](http://www.icedoc.org/winwin.htm)

- Elzaway A (2017) **One More Proposal to Allocate Resources for the Win-Win Approaches to Increase the Affordability of Cancer Drugs and Radiotherapy in the World. J Cancer Prev Curr Res 7(5)**

<https://www.clinmedjournals.org/articles/ijccr/ijccr-2-016.php?jid=ijccr>

**In addition to the lack of foreseen remarkable increase of radiotherapy and medical oncology services, there are -among others causes- the increase in cancer incidence and prevalence in LMICs partially due to increase in population, increase of life expectancy , lower mortality due to communicable in comparison to non-communicable diseases and change of life style.**

- **Ferlay I, Soerjomataram M, Ervik D, Forman F, Bray F, et al. (2013) GLOBOCAN 2012 v1.0 **Cancer incidence and mortality worldwide: IARC Cancer Base No. 11. International Agency for Research on Cancer, Lyon, France.****
- **. Stewart B, Wild C (2014) **World Cancer Report 2014**. IARC, Lyon, France.**

**In December 2007**, The Win-Win Scientific initiative was proposed by Ahmed Elzawawy as an initiative of ICEDOC's Experts in Cancer Without Borders

- It aims at the increase of affordability of better value cancer care in the world *via exploring scientific approaches*.
- All the stakeholders- particularly cancer patients and their families- could win!. As it considers the interests and incentives of all stakeholders in the real world, hence, it includes the the progress of science, flourishing the business of pharmaceutical companies and Manufacturers of radiotherapy machines and medical devices without ruining a country or individuals economies. <http://www.icedoc.org/winwin.htm>  
& <http://www.icedoc.net/winwin.htm>

The notion of The Win-Win is growing. Hence, in 29 April, 2016, it joined Harvard Global Health Catalyst GHC ( Director: Prof. Wil Ngwa) , Dana Farber/ Harvard Cancer Center and became one its activities. Hence, it becomes :

**“Harvard Global Health Catalyst GHC  
Win-Win Initiative”.**

**This would assure progress, continuity and broad partnership.** Moreover, the Corps of the Win-Win volunteers has started its formation from -particularly -younger colleagues plus older experts.

**We are professional consultants and we are volunteer catalysts ( and not a funding body).**

**So, as facilitators, we are encouraging all to do, to connect and networking with each other and to collaborate or partnership. The initiative is opened for partnership with experts, industries, organizations and all constructive ideas that serve its cause. We are NOT competing or replacing any organization or society, but a forum for all. The Win-Win initiative is a notion. It is not one more organization, but a dynamic movement and initiative. It is a hand in hand cooperation.**

***The Win-Win belongs to all!***

**Once again, The Win-Win will continue and succeed only with the contribution of many!.**

**The Win-Win belongs to all!**

# The 2 Wings of the Win-Win are :

The first wing is “**Exploration of scientific approaches for resource sparing and how to increase affordability of better value cancer care**”.

Ahmed Elzawawy (2012). **Science and Affordability of Cancer Drugs and Radiotherapy in the World - Win-Win Scenarios**. In: **Advances in Cancer Management**, Ravinder Mohan (Ed.), InTech,

<http://www.intechopen.com/articles/show/title/science-and-affordability-of-cancer-drugs-and-radiotherapy-in-the-world>

**You'll find in this open access references many examples we cited about resource sparing cancer drugs systemic therapy and not only radiotherapy.** ( As the topic is clinical oncology)

**There are so many to say, to do and to explore in the fields of resource saving radiotherapy and chemotherapy without compromising the outcome on patients.**

Please refer to examples of our publications since 2007 and working meetings during ASCO conferences and ESMO ECC <http://www.icedoc.org/winwin.htm>

**& (Ahmed Elzawawy : Better value Chemotherapy. In How to get better value Cancer care, Muir Gray and David Kerr, Offox press, Oxford,2013)**

- **The second wing of the win-win initiative:**

**This wing regards catalyst action and professional advice to increase enormously the rate of establishment of services of clinical oncology in the world starting with the most difficult challenges in Africa.**

**Despite that our scope is the world ,but we start with the most lacking services and difficulties in Africa. It is message for Stakeholders and Manufactures of cancer care requirements; drugs and machines, if we succeed together in Africa, you'll succeed enormously everywhere.**

**We don't claim that we as win-win catalyst and volunteer advisers - will have the credit but the stakeholders –International and National- and the locals doers of any project are the real heroes.**

***This Wing was proposed in November, 2015 and declared in 29 April, 2016 during the Harvard Catalyst Summit @ Harvard Medical School.***

- Some points:
  - - It is a **Myth** to think that it is just a dream and it is not feasible to increase the availability of at least **additional** 5000 Clinical Oncology units with essential cancer drugs and care including Radiotherapy machines –more than what is expected to sell- in the upcoming 10 years.

( Hence, the issue is not about one center here or there, not about just very few more machines established in some developing countries –with big disproportional propaganda by international bodies) .

- **It is NOT a naive thinking, but, presenting it in simple and direct way and searching for solutions-together- is an advantage.**

- - It is also a **Myth** to think that **there are no local resources in African and LMICs countries**. But, if there is a well-presented project of profitable radiotherapy service then it would be feasible to mobilize local resources to fund.
- Moreover, a well-studied project with good business model customized to the local conditions and that could function in a community could be funded by public or private –public partnership or get loans from banks or local stakeholders . Also, we ask Diaspora to invest and to gain in Win-Win Projects! (**For example: In 2014, The remittance from diaspora to sub-Saharan Africa was 67.1 billion \$ more than total foreign aid!**)

## The Notion of better value healthcare:

After 40 years of uncertainties and the money spent in quality studies there is insufficient evidence about whether or how the quality of care has actually improved. Robert Brook, a pioneer quality expert, declared in 2010 :

**“The end of the quality movement and long live improving value!”**

Brook, R. H. (2010) The end of the quality improvement movement. JAMA 304: 1831–1832.

# Welcome to the third and The fourth health care revolutions!

When a revolution is brewing, those in power are often the last to know, particularly if the weaponry of the revolution is knowledge and not gunpowder, if the artillery is the Web and not cannons, and if the revolutionaries are the patients, still mostly deferential and polite in the consultation.

( From Muir Gray, David Kerr and contributors. "How to get better value cancer care" . Oxford press , Oxford , 2013)

**The third revolution in health care** implies **the use of knowledge and informatics for getting better outcomes centered around the customers** i.e. the patients. Hence, it implies the use of **the new term” Value”**. In 2013, Sir Muir Gray and David Kerr stated that “Value” will be the eminent term for the upcoming years. It will not extinct the previous terms but it will embrace them. ( **Muir Gray, David Kerr and contributors: How to get better value cancer care. Offox press , Oxford , 2013**) ( I contributed with a chapter “Better Value Chemotherapy” in this book)

**- The Third Healthcare Revolution has begun** and it is significant as the First and Second Revolutions.

**The Fourth Industrial Revolution has already started its implementation and thoughts for more progress :**

- Robotic and Artificial Intelligence.
- Nanotechnology
- Quantum Computing.

The Third Industrial Revolution is transforming every service and industry and its drivers are knowledge, the World Wide Web, and citizens. Healthcare is relatively protected at present because of the need to deliver much of the care that people require in or near their own homes, but the job of both the clinician and the patient will be changed by the forces of the Revolution as dramatically as have the jobs of the investment banker and travel agent. ***This Revolution, driven by citizens, information technology and knowledge, is already underway to create new health services that:***

***1) have the patient at their centre; 2) are safer and more effective; 3) produce greater value from the resources invested. These could be summarized as “ How to get affordable, evidence based , better value cancer care to patients in the world ”*** The win-win initiative [www.icedoc.net](http://www.icedoc.net)

- **Value** is defined as outcomes relative to costs.
- It encompasses cost-effectiveness and efficiency.
- In the last 50 years terms like effectiveness, efficiency, cost effectiveness, quality and safety , were the dominant words in fields of health care.

**Value** depends **on results**, not inputs. Value in health care is measured by the outcomes achieved, not the volume of services delivered. **Shifting focus from volume to value is a central challenge.**

**Value** is not measured by the quality of the process of care used. Despite that Quality measurement and the process of its measurement and its improvement were considered of extreme importance, but in value they are considered as tactics and not objectives themselves. Also, in Value, they are not substitutes for measuring outcomes and costs. (Porter, NEJM 2008 & Sir Muir Gray & D Kerr, How to get better value cancer care, Oxford Press, UK 2013. )

Put it simply:

Value is the relationship between the outcome and the resources used.

In turn, in outcome , the determination of the quality and safety of the intervention or service are important elements. ( Muir Gray and D Kerr, 2013)

Economic measures like **Cost reduction without regard to the outcomes achieved is dangerous and self-defeating**, leading to false 'savings' and potentially limiting effective care . (Porter, NEJM 2008)

The win-win scientific initiative suggests to use of the reduction in waste to fund more appropriate, better value treatment. It considers the interests of all stakeholders

( Elzawayy: <http://www.icedoc.org/winwin.htm> )

- The win-win initiative implies that we don't copy protocols or guidelines if they don't fit the local patients and conditions, but to tailor your approaches and protocols in scientifically evidence based ways in your community and to consider how to get better value health care according to real conditions among your patients in your community ( **ICTs could be of high value in exchanging experiences and consultations that could be in turn beneficial to patients in Africa, LMICs and in parts to rich countries as well** ) .

**To give models for resource sparing** , we cited many examples based on science and on publications for resource saving breast cancer radiotherapy and systemic drug therapy in curative and palliative management of breast cancer management **without compromising the outcome.** (A Elzawawy, Publications and presentations 2008- 2018)

Example of References to download : Ahmed Elzawawy (2012). Science and Affordability of Cancer Drugs and Radiotherapy in the World - Win-Win Scenarios, Advances in Cancer Management, Ravinder Mohan (Ed.), ISBN: 978-953-307-870-0, InTech, Available from:  
<http://www.intechopen.com/articles/show/title/science-and-affordability-of-cancer-drugs-and-radiotherapy-in-the-world>

# Examples of explorations of scientific avenues for Resource sparing in radiotherapy for breast cancer

## **.1 Postoperative – post mastectomy and post lumpectomy – radiotherapy of breast Cancer: .**

### **A- Altered fraction schedules :**

- Shorten fractionation for postoperative radiotherapy (Hypofractionation)**
- Accelerated partial breast irradiation (APBI)**
- Concurrent boost radiotherapy (CBRT) during the course of whole-breast radiotherapy (WBRT)**

### **B-Less number of radiation fields**

### **C- Different options in techniques**

# 1-Shorten fractionation for post operative radiotherapy

**( Hypofractionation):** The example of The UK standardization of breast radiotherapy (START) randomized trial B in which a radiation schedule delivering **40 Gy in 15 fractions** offer rates of local-regional relapse and late adverse effects **at least as favorable as the standard of 50 Gy in 25 fractions.** ( Ref: The START Trialists' Group: The UK Standardisation of Breast Radiotherapy (START) Trial B of radiotherapy hypofractionation for treatment of early breast cancer: a randomised trial. Lancet. 2008 March 29; 371(9618): 1098–1107 )

- Breast Ca. patients who undergo the accelerated radiation not only benefit from the shorter length of time for treatment, but they also suffer less severe side effects. (2015)
- The fractionation-inspired from the long years French experience- that we use in Port Said, Egypt is 45 Gy in 18 fractions.

- **Although the American Society for Radiation Oncology (ASTRO) has urged the use of Hypofractionation –whole breast irradiation (HF-WBI) for women aged 50 years and older on the basis of category 1 evidence, its adoption has been slow.**
- **Two complementary articles published in *JAMA Oncology* on August 6, 2015 provide further evidence that Hypo-fractionation HF is associated with less toxicity and provides women with a better quality of life compared with Classical Fractionation CF.**
- **With comparable tumor control, lower costs, and reduced morbidity, hypofractionation should be strongly considered for the majority of patients with early-stage disease ( Shyam K. Tanguturi, MD, the Harvard Radiation Oncology Program, Boston, and Jennifer R. Bellon, MD, of the Dana-Farber Cancer Institute, Boston).**

- **The study was conducted in 287 women aged 40 years and older with early-stage breast cancer (stage 0-2), who were randomly assigned to receive either HF-WBI (42.56 Gy in 16 fractions of WBI; n = 138) or CF-WBI (50.00 Gy in 25 fractions of WBI; n = 149).**

**The rate of physician-assessed toxicity of grade 2 or higher was significantly lower for women receiving HF-WBI (47% vs 78%;  $P < .001$ ), as were acute toxic effects of grade 3 or higher (0% vs 5%;  $P = .01$ ). In particular, rates for physician-assessed fatigue, pruritus, breast pain, and dermatitis were significantly lower for women receiving HF. Although patient-reported quality of life, as reported from the Functional Assessment of Cancer Therapy for Patients with Breast Cancer, was similar for women receiving HF and CF, items associated with lack of energy and trouble meeting family needs favored women receiving HF. ('Mounting Evidence' for Hypofractionation in Breast Cancer. *Medscape*. Aug 06, 2015.)**

**2- Less number of radiation fields:** Since systemic adjuvant therapy is given to most patients nowadays, the traditional radiotherapy technique has been modified., **it is no longer recommended that patients who have undergone complete or level I/II axillary dissections- for not heavy axillary Lymph nodes involvement- should receive full axillary radiotherapy** since survival is not improved and the risk of lymphoedema is increased. Also, the **isolated internal mammary chain failure is rare even when radiotherapy is not given.**

**Ref:** Truong PT, Olivotto IA, Whelan TJ, Levine M. **Clinical practice guidelines for the care and treatment of breast cancer: 16.Locoregional post-mastectomy radiotherapy.** CMAJ 2004; 170 (8): 1261 – 1273.

- In 2007, the IAEA initiated a prospective randomized clinical trial to compare the local control, regional control, overall and disease-free survival of stage IIA – IIIA breast cancer patients randomly assigned to post-mastectomy radiotherapy with or without irradiation of the supraclavicular lymph node (SLN) region. There were 469 women randomized, A multi-center, international randomized trial directly comparing supraclavicular radiation (40 Gy in 15 fractions, concurrent to chest wall radiotherapy) vs. no supraclavicular radiation and chest wall radiotherapy alone, post-mastectomy and post-chemotherapy. Chest wall radiated at 40 Gy in 15 fractions. Outcomes of patterns of failure, survival and adverse events are comparable. However, A meta-analysis of randomized trials, EORTC trial 22922-10925 (7170 pts.) concluded that irradiation of the lymph node regions improves outcomes.

[\(Rosenblatt E, Jones GW, El-Mongy M, Mahmood H, Marinello J, Elzawawy A, Shahid S, Filiali-Benaceur D, Yarney J, Moscol Ledesma J, Bese NS, Campbell O. Irradiation of the supraclavicular nodal region in postmastectomy radiotherapy; an IAEA randomized trial Radiotherapy and Oncology 04/2015; 115\(Supplement\):S94-S95. DOI:10.1016/S0167-8140\(15\)40187-2\)](#)

**- A single dose of Targeted intraoperative radiotherapy** delivered at the time of lumpectomy may be an effective alternative to external beam radiation delivered over several weeks among selected patients with early breast cancer. Findings of this international Phase III trial were published in *The Lancet*.

**Reference:** Vaidya JS, Joseph DJ, Tobias, JS, et al. Targeted intraoperative radiotherapy versus whole breast radiotherapy for breast cancer (TARGIT-A trial): an international, prospective, randomised, non-inferiority phase 3 trial. *The Lancet*. June 5, 2010.

# Palliative radiotherapy of painful bone metastasis:

- **Single versus multiple fractions**
- **Half-body irradiation**
- **Less extensive tests during follow up of radiotherapy of bone metastases**

**(The later goes with the concept Choose Wisely Campaign and we should adopt the methodology of top lists of Oncology practice . After discussion with Lowell Schnipper (USA) “ It is not necessarily to be the same lists of the USA, but to inspire the concepts & methodology in different countries)**

## C- Different options of techniques

e.g. In selected cases , **Prone position** for irradiation of post lumpectomy Radiotherapy is comparable to IMRT (Intensity Modulated Radiotherapy) in saving Lung and heart radiations doses of exposure. But , with marked less time and efforts and costs. If we **combine it** with **hypofractionation**, then **more remarkable resource sparing could be achieved.**

- **General strategic planning of radiotherapy facilities in developing countries. (A Global Strategy for Radiotherapy. A WHO Consultation, Porter et al., 1999):** In a Consultation to the World Health Organization, A global strategy for Radiotherapy was proposed. It considered different local parameters including the Gross National Product GNP per Capita that categorized countries in the world into 4 groups (Levels). Accordingly series of **three tier radiotherapy service was proposed, with internet-based intercommunication strategy** ( I had the honor to be one the nine Consultants who formulated this WHO consultation). **Such a network could be cost effective, help to bridge the gap, and give all patients access to the state-of-the-art technology in radiotherapy** (Datta & Rajasekar, 2004).

- **Practical modifications of the system of work in radiotherapy departments** in order to treat more numbers of patients, like **a) to increase the hour work of cobalt machines in developing countries,** **b) to increase the number of fractions a week** from 5 to be 6 fractions in certain applications may improve outcome of radiotherapy treatment for patients with head and neck cancer and increase the days of work of machines (**Overgaard et al., 2006**), **c) the reduction of Machine downtime in many developing country institutions** that is mainly due to problems of maintenance and lack of culture of local regular preventive maintenance (Bhadrasain, 2005).

In our view, we emphasize on the importance of developing\* more **programs that assure that most of the problems of down-time of machines would be fixed in the soonest as possible** by the **local teams** either solely or and with prompt telecommunication with the manufacturer maintenance staff. ( training....training...training)

( \* Developing and implementing **widely** and NOT just talking about! )

## Professional training

**Customized** and regular updating training are recommended for the local medical and technical staff and maintainers (Bhadrasain, 2005 & Porter et al., 1999).

***This is because the local staff -and not the sophistication in machines- are the back bone of resource sparing and successful cost effective treatment for more number of patients.***

- **We think that it is important to look to Africa and Low and Middle Income Countries LMICs as contributors in the solution and **NOT** as a burden on the world.**
- **Actually, in Africa and some LMICs, there are difficulties, lack of adequate care , training , outreach and barriers for conducting more valid studies, trials and for innovative ideas to tackle the lack of holistic cancer care and radiotherapy in Africa. There are many potentialities for information and communication technologies and hopefully collaborations that could be reflected not only to more affordability of better value radiation oncology and cancer care in Africa and LMICs, but also in the world.**

# Future directions regarding radiotherapy

From the above cited points and examples, and by rough estimation, and without additional high resources, **the number of cancer patients treated by the present existing facilities of radiotherapy could be nearly doubled particularly in the middle income countries**. This could increase the cost-effectiveness of radiotherapy in the world and hopefully would be a stimulus for increasing facilities of radiotherapy in the world. **This means that it wouldn't hinder the purchase of considerable additional numbers of new equipment, but it would be a strong stimulus and it would pave the way to **significant increase in numbers of new machines in the world** in the upcoming years.**

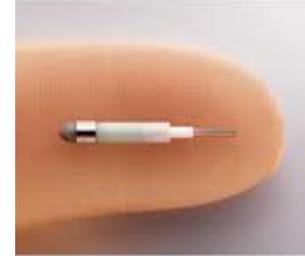
**As most as possible, we should avoid what I call “1-1+1= 1” ( Ahmed Elzawawy)**

**That is to avoid replacing an old machine that could be repaired and to purchase a new expensive one, then, finally you have the same number of equipment. Whenever it is possible, Try as most as you can to repair the old and add a new one!.**

- Elzawawy A. **Breast Cancer as a Model to Improve Outcome of Cancer Care in Low- and Middle-Income Countries.** World Journal of Surgery: Volume 39, Issue 3 (2015), Page 693-694)

# Electronic Brachytherapy (eBx) - What is it?

- **Uses a miniaturised X-Ray tube instead of radioactive sources**



- **Used for HDR-Gyn, Intraop Breast & Skin Treatments**
- **It is clinically proven and reliable**
- **Advantages: It avoids**
  - **a) Isotope administration, transport, handling, disposal (\$\$) b) Additional room shielding (\$\$)**
  - **c) Risks in case of system failure**

# Miniature X-ray Source Dose – Energy Characteristics

***The unique, proprietary non-radioisotope high dose – low energy source***

## Advantages

- Outpatient treatment times same as fresh (7 Ci) Ir<sup>192</sup> source
- Source doesn't decay over time therefore maintains constant dose profile
- Minimal stray radiation to normal tissue, organs, and medical personnel
- Minimal shielding required
  - i.e. no bunker → Portable
  - Medical staff can remain in the room with the patient, as determined by the facility Radiation Safety Officer
  - Enables IORT



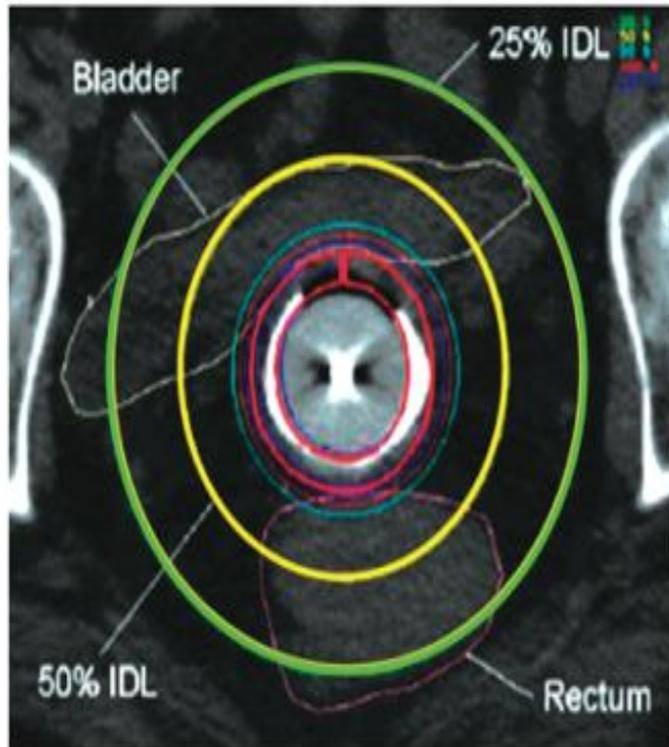
**Breast Balloon Application.**

# Treating Endometrial Cancer with eBx

- **Patient Driven:**
  - Increased access for the patient
  - Medical personnel can stay in the treatment room as determined by the facility Radiation Safety Officer
- **Physician Driven:**
  - Improved Dosimetry,
  - Applicator insertion and treatment set-up similar- No isotope handling - Minimal shielding required
  - *it has significant competitive advantages then HDR Iridium due to its more optimal dose targeting that dramatically reduces dose to the bladder and rectum*

# Treating Endometrial Cancer with eBx

## Ir-192 HDR

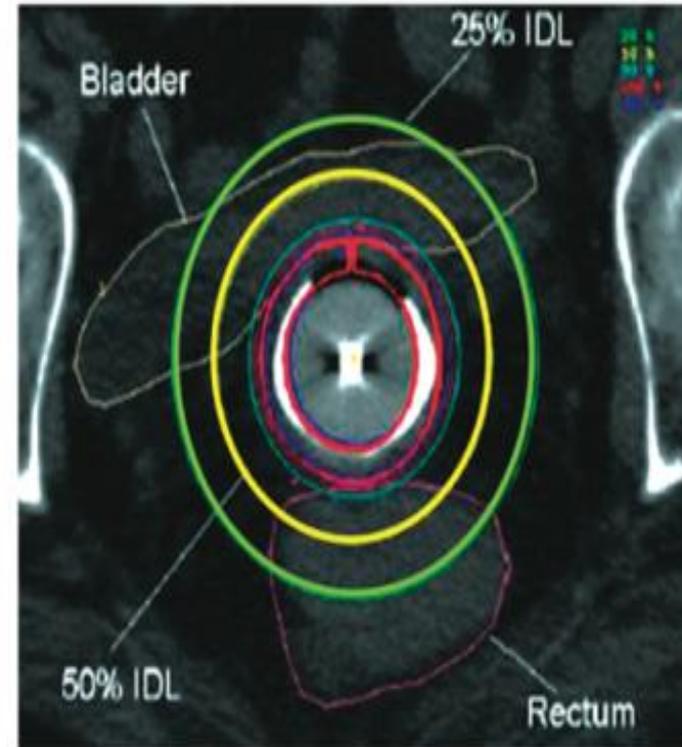


$V_{95\%} - 99.7\%$

Bladder  $V_{35\%} - 47.7\%$

Rectal  $V_{35\%} - 48.3\%$

## Xoft 50 kV Source



$V_{95\%} - 99.6\%$  (p=ns)

Bladder  $V_{35\%} - 27.4\%$  (P<.05)

Rectal  $V_{35\%} - 28.3\%$  (P<.05)

## **Electronic Brachytherapy ( Cont'd ) :**

Once again, we stress on that we are not promoting one technology or the production of a certain company , but we cite the example of the Electronic Brachytherapy as:

**The idea is interesting. But, as any new interesting technology, it could be more developed with more ideas and applications.**

**Could the Electronic Brachytherapy be considered as a way to increase affordability of cost effective brachytherapy for more number of patients by one transportable machine to serve in several units and different cities?. Plus, No radioactive isotope!**

**But, also to be clear , our objective is care of human beings come first and not a certain technology.**

**Hence, We should use maximally what we have of Cobalt Machines to serve cancer patients.**

**Not only the problem of electricity , but mainly the problems of maintenance , times of non function of Linacs and the real bitter experiences in developing countries with some agents of big Manufactures. More serious efforts should be done to tackles these points. At least 80-85% of problem of maintenance should be done promptly by local well trained technicians , while the remaining should be solved at the soonest with the interference of the companies or their offices. That if we want to work seriously together to promote everywhere that **Radiotherapy is very cost effective.****

# Global scientific approaches for affordability of cancer care that consider realistic incentives and conditions could give proposals for the most affluent countries too:

- Elzawawy A, Kerr D. : **Variation in the availability of cancer drug generics in the United States of America.** Ann Oncol 2013; 24 (suppl 5):v17-v22
- Elzawawy A. : **The Shortage of Essential Cancer Drugs and Generics in the United States of America: Global Brain Storming Directions for the World.** Int J Cancer Clin Res 2:016, 2015.  
<http://clinmedjournals.org/articles/ijccr/ijccr-2-016.php?jidiijccr>
- The win-win scientific initiative:  
<http://www.icedoc.net/winwin.htm>

Please bear in mind that we advocate to **Focused and Globally Coordinated Scientific Works**:

- To explore unlimited approaches to resource sparing and cost effective care
- Practical tactics that consider the incentives and interests of all stakeholders
- Mobilisation of every possible resources ; financial and human resources and allies and opened to all sorts of consutive partnerships in **Win-Win** scenarios that cope with the real world.

- We should not stop in front of barriers to just **to cite or enumerate as a destiny**. The role of science and flexible smart human brain thinking is to solve problems ( Look around for all inventions that we all use).
- For example we should not stop in the station of the problem of sky rocking increase of costs novel drugs and equipment , but to explore scientifically how to manage, how to increase affordability and Equity . ( It is not by talks and declarations!).

- **For Example: In front of the problem of power supply and sustainability of electricity , we call to explore different options like generators , solar powered radiotherapy ( Examples: 2 Linacs in Germany and a project in Ghana of solar power linear accelerator.**

For more information Contact our Colleague in The Win-Win : Holger Wirtz, Medical Physicist & Engineer , Germany Email: [wirtz@strahlentherapie-singen.de](mailto:wirtz@strahlentherapie-singen.de) )

**Hence, instead of having (a semi eternal! ) problem, the production of electricity , as an option in projects for radiotherapy services could supply the neighbours services and be a source of income from selling electricity in order to support providing cancer care.**

**Also as a reminder, we are not promoting for a certain single option or technology or a company , but we should be opened for all explorations and to select what could work for every certain location. This would be updated or modified by time.**

**-A very Important reminder: The most important element is the local cancer Health care providers.** Their education, training , working to reduce remarkably the brain fleet by realistic care of the cancer care givers ( Financial, social, scientific and in their career locally) and the technical support to involve the local staff to as a part of the international scientific works while they are serving onsite. All these points and others could enrich the global progress in different scientific, economic aspects.

Elzawawy AM: **Could African and Low- and Middle-Income Countries Contribute Scientifically to Global Cancer Care?** JGO – Journal of Global Oncology Volume 1, Issue 2, December 2015 <http://jgo.ascopubs.org/content/1/2/49>

## **Some of our main messages are:**

- In front the increase in the expenses of the chemotherapy and radiotherapy care and the increase of prevalence of cancer cases and the demand for care , the world is facing an increasing crisis now and in the upcoming years.**
- 
- The problem is facing – with wide varieties- all the world , the affluent and the less affluent countries . The pressing challenges are facing all the stakeholders .**
- There is a lot of talks about the magnitude of the problem , repeated numbers , figures , tables, publications...., but , there is a less than adequate search for effective solutions that fit the real world!.**

- **Millions of cancer patients and their families in the world are in need to actual, touchable, accessible and affordable cancer services and not just talks or publications or declarations or conferences.**

**The Harvard GHC Win-Win needs a hectic work - together as a condition- in the upcoming 6-7 years divided into 3 phases starting with 4-5 African Countries...then to accelerate the movement!.**

- It is mostly not depending on donation from abroad, but, it is mainly by win-win collaboration and/or partnership and with mobilization of resources particularly the locals. But, despite of all challenges , it could be a turning point in the history of affordability of cancer care in the real world , based on science, ... and win-win.**

**<http://www.icedoc.org/winwin.htm>**

**<http://www.icedoc.net/winwin.htm>**

**Please feel free to communicate with Harvard Global Health Catalyst Win-Win Initiative with your scientific ideas and proposals of studied projects to serve your community or other countries (or your company!) . It is a call for all...Colleagues cancer care givers, societies and organizations and all stakeholders including manufactures of cancer drugs and equipment.**

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[worldcooperation17@gmail.com](mailto:worldcooperation17@gmail.com) & [ww.icedoc.org/winwin.htm](http://ww.icedoc.org/winwin.htm)

**& Wil Ngwa , Director of Harvard GHC**  
[WNGWA@bwh.harvard.edu](mailto:WNGWA@bwh.harvard.edu) ( on Behalf of all dear colleagues in the Harvard Global Health Catalyst GHC Win-Win initiative)

Please feel free to refer to some of our relevant publications and presentations in this link and the following examples

1- <http://www.icedoc.org/winwin.htm>

2 - Elzawawy A: **Science and Affordability of Cancer Drugs and Radiotherapy in the World: Win-Win Scenarios**, in Mohan R (ed): **Advances in Cancer Management**. InTech, 2012.

<http://www.intechopen.com/articles/show/title/science-and-affordability-of-cancer-drugs-and-radiotherapy-in-the-world>

**3-** Elzawawy, A.M. (2008). **Breast Cancer Systemic Therapy: The Need for More Economically Sustainable Scientific Strategies in the World**. *Breast Care*, Vol. 3, pp. 434–438

4 - Elzawawy, A.M. (2009). **The "Win-Win" initiative: a global, scientifically based approach to resource sparing treatment for systemic breast cancer therapy**. *World Journal of Surgical Oncology*, Vol. 7, pp. 44

- 5- Kerr, D. and Elzawawy, A. **TARGETED THERAPIES. Manufacturer sponsorship bias in economic analyses matters.** *Nat. Rev. Clin. Oncol.* 9, 309–310 (2012)
- 6- Elzawawy AM, Kerr DJ 2013 **Variation in the availability of cancer drug generics in the United States of America.** *Ann Oncol Suppl* 5: v17-v22.
- 7- Elzawawy A (2015) **The Shortage of Essential Cancer Drugs and Generics in the United States of America: Global Brain Storming Directions for the World.** *Int J Cancer Clin Res* 2(2): 016. <http://clinmedjournals.org/articles/ijccr/ijccr-2-016.php?jid=ijccr>
- 8- Ahmed Elzawawy . **Better Value Chemotherapy** . Chapter 6. In **Muir Gray J A and Kerr D J (Eds) How to Get Better Value Cancer Care** , Offox Press Ltd, Oxford , UK. 2013
- 9-Elzawawy AM: **Could African and Low- and Middle-Income Countries Contribute Scientifically to Global Cancer Care?** *JGO – Journal of Global Oncology* Volume 1, Issue 2, December 2015 <http://jgo.ascopubs.org/content/1/2/49>

**10-Elzawawy A. Breast Cancer as a Model to Improve Outcome of Cancer Care in Low- and Middle-Income Countries** World Journal of Surgery: Volume 39, Issue 3 (2015), Page 693-694

**11- Elzawawy A (2017) One More Proposal to Allocate Resources for the Win-Win Approaches to Increase the Affordability of Cancer Drugs and Radiotherapy in the World.** J Cancer Prev Curr Res 7(5): 00250.

**12- Taking up Africa cancer challenge . Bulletin of World Health Organization April 2018 ( in this WHO article our Win-Win notions are stated )**

- **Books:**

- **W Ngwa , T Ngoma .Emerging Models for Global Health in Radiation Oncology** IOP publishing 2016
- **W Ngwa , P Nguyen. Global Oncology** IOP Publishing 2017
- **Muir Gray and David Kerr. How to get better value Cancer care, Offox press, Oxford,2013**

**.....and more!**

**Again...and again: The Win-Win initiative with its notions- becomes a movement- belongs to all of you dear colleagues everywhere!**

**Then,.....Going forward, hands in hands**

**Ahmed Elzawawy, MD**

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• [www.icedoc.org](http://www.icedoc.org) & [www.icedoc.org/winwin.htm](http://www.icedoc.org/winwin.htm)

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