International Atomic Energy Agency Scientific Forum

A Decade of Action on Cancer Control and the Way Forward

IAEA
International Atomic Energy Agency
Atoms for Peace and Development

17—18 September 2019
Vienna International Centre
Board Room D, C Building, 4th Floor

Production and quality control of radiopharmaceuticals in Iran

Shahab Sheibani

Atomic Energy Organization of Iran, I.R. of Iran

Atomic Energy Organization of Iran

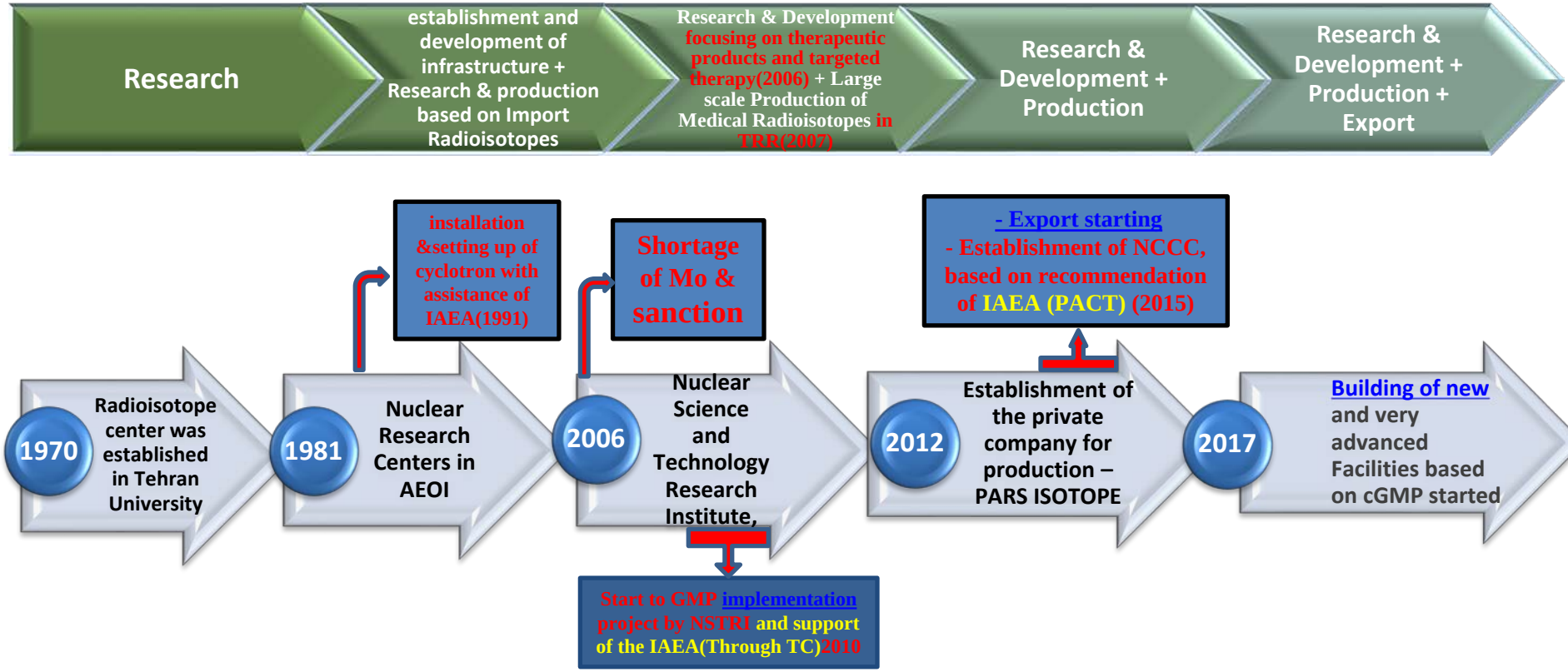
Preface: what happened during past decade

- Enhancement of National capacity and development of infrastructures for the production of diagnostic and therapeutic products in the I.R. of Iran based on NCCP and with the support of government, NGOs and also IAEA.
- Iran is now in a position to meet almost of all its national radiopharmaceutical demand
- Iran is one of the few countries recognized as a supplier of medical radioisotopes and radiopharmaceuticals exporting its products to other countries
- Establishment of National Cancer Control Committee (NCCC) based on recommendation of Pact program of IAEA and request of vice president and head of AEOI.
- Review and updating of National program for cancer control in different fields by NCCC.

Key Factors for having a Successful Program

- **Existing a national program and providing roadmap**
- **Identify, synchronize and using of national and international potentials and experiences**
- **Sharing the experiences, knowledge and achievements with other member states**

Achievements: Important Stages and Events



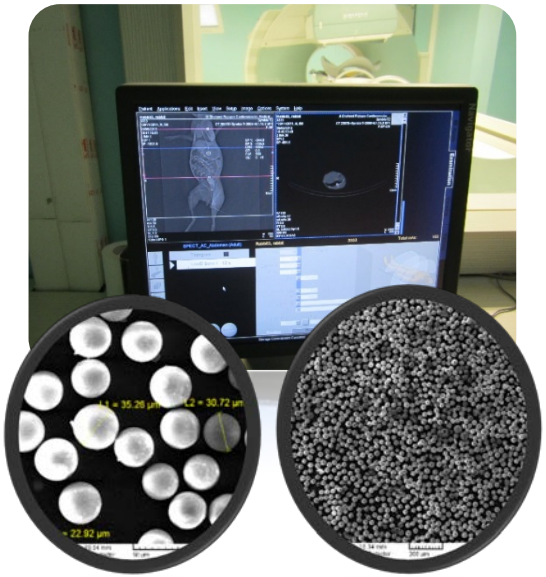
IAEA International Atomic Energy Agency

	1st year of approval	TC Project Number	Field(s)
1	1975	IRA2002	(2C) Radio analytical Techniques
2	1982	IRA2004	(4H) Production of Isotopes
3	1983	IRA2003	(2G) Radiopharmaceuticals
4	1993	IRA2005	(2G) Radiopharmaceuticals
5	1990	IRA4018	(4H) Production of Isotopes
6	1991	IRA4019	(4H) Production of Isotopes
7	1993	IRA4021	(4H) Production of Isotopes
8	1995	IRA4023	(4L) Radiation Engineering and Accelerator Technology
9	1997	IRA4026	(4H) Production of Isotopes
10	1999	IRA4030	(4H) Production of Isotopes
11	1999	IRA4031	(4H) Production of Isotopes
12	2001	IRA4032	(4H) Production of Isotopes
13	2001	IRA2006	(2G) Radiopharmaceuticals
14	2005	IRA2007	(2H) Quality Management (QM) of Radiopharmaceuticals
15	2007	IRA2008	(2G) Radiopharmaceuticals (4H) Production of Isotopes (6C) Radioisotope and Radiation Treatment
16	2009	IRA2009	(2G) Radiopharmaceuticals (4H) Production of Isotopes (6C) Radioisotope and Radiation Treatment
17	2009	IRA2010	(2G) Radiopharmaceuticals (2H) (QM) of Radiopharmaceuticals (2I) (QM) and (GLP) for Radio analytical Techniques
18	2014	IRA6009	(28) Radioisotopes and radiopharmaceuticals production for medical applications
19	2016	IRA6010	(28) Radioisotopes and radiopharmaceuticals production for medical applications
20	2018	IRA6011	(28) Radioisotopes and radiopharmaceuticals production for medical applications

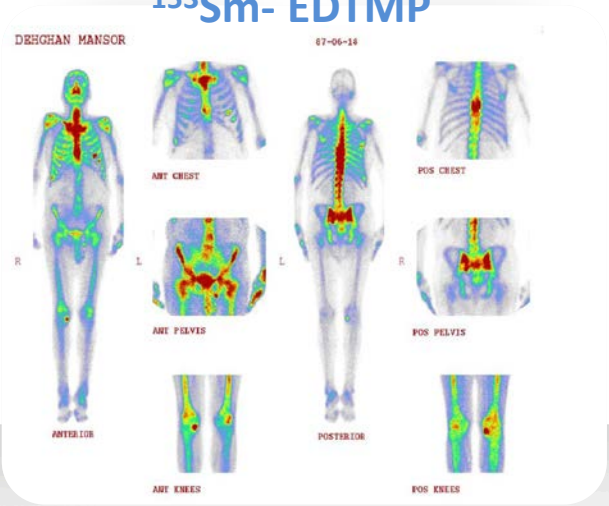
- 18 TC projects in the area of radiopharmaceuticals since 1975
- 50-60 Fellowships and Scientific Visits
- 50-60 Expert Missions to the country
- Purchase of equipment and materials
- imPACT missions

Some achievements of TC projects during past decade

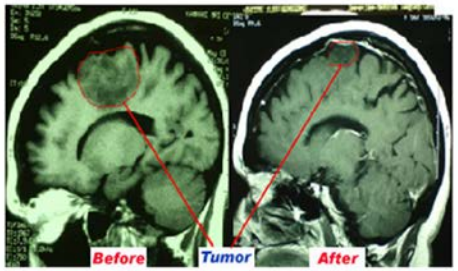
^{90}Y- Glass microsphere

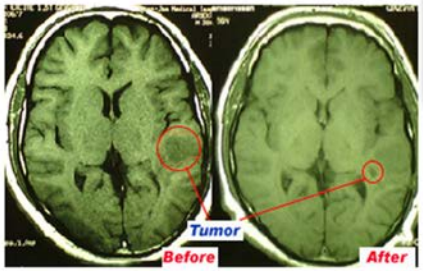


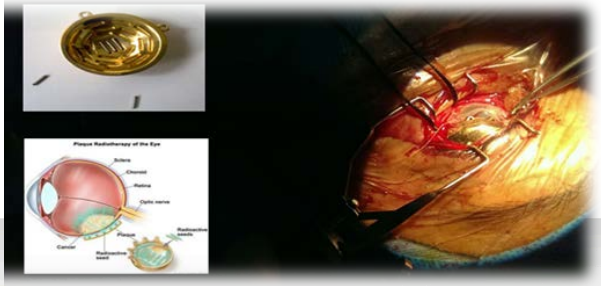
^{153}Sm- EDTMP



^{125}I- Brachytherapy sources and their usage in treatment of Brain and Eye tumors







Diagnostic cold kits:

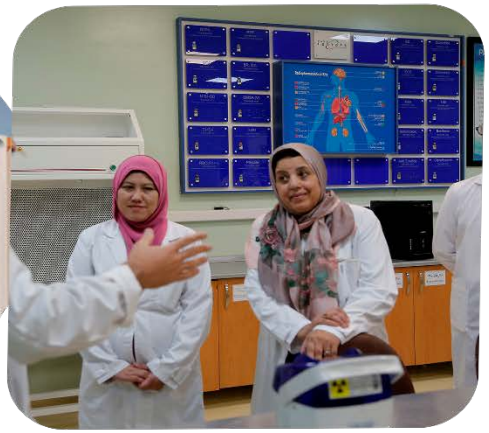
- OCTREOTATE
- OCTREOTIDE
- UBI
- BOMBESIN

Some renovated laboratory for production of reactor based products

I-131 production facility

Mo^{99}/Tc^{99m} generator production facility

- I-131
- P-32
- Sm-153
- Re-186
- Y-90
- Lu-177
- Ho-166



Brachytherapy laboratory

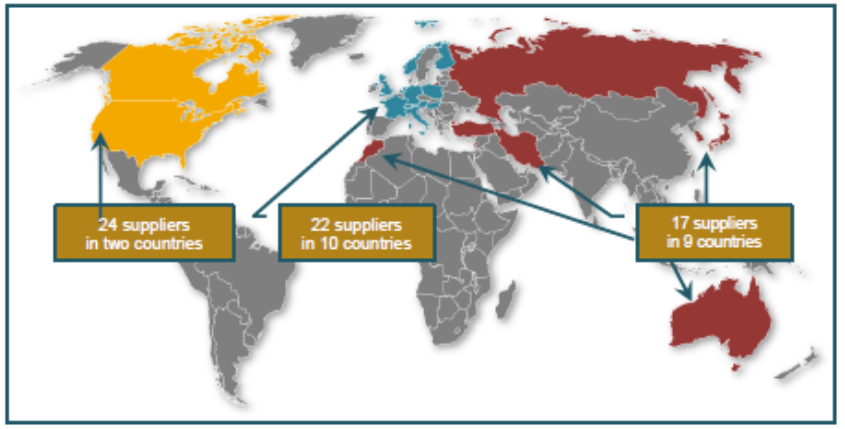
Cold kits production laboratory

Medical Products

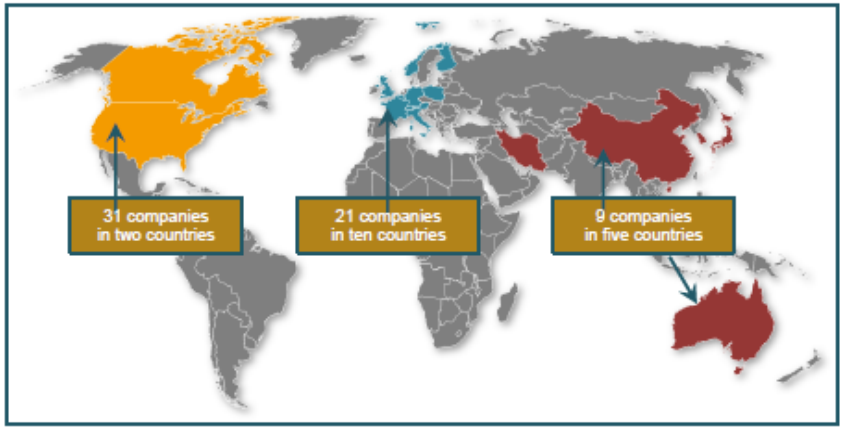
Situation of Nuclear Medicine in IRAN in past decade

Number of nuclear medical centers	• *1989: less than 10 , 2006:100* • *2011: 120 , 2019: 193*
Number of PET centers	• *1989: 0 , 2006: 0* • *2011: 0 , 2019: 5*
Number of nuclear medicine specialists	• *1989: less than 10* • *2019: More than 200*
Weekly use of Tc-99m generators	• *1989: 0 , 2006: 140* • *2011: 200 , 2019: More than 300*
Weekly use of I-131(*Curies*)	• *1989: 0 , 2006: 10* • *2011: 14 , 2019: 25-30*

- **WORLD MAP OF NUCLEAR MEDICINE SUPPLIERS**

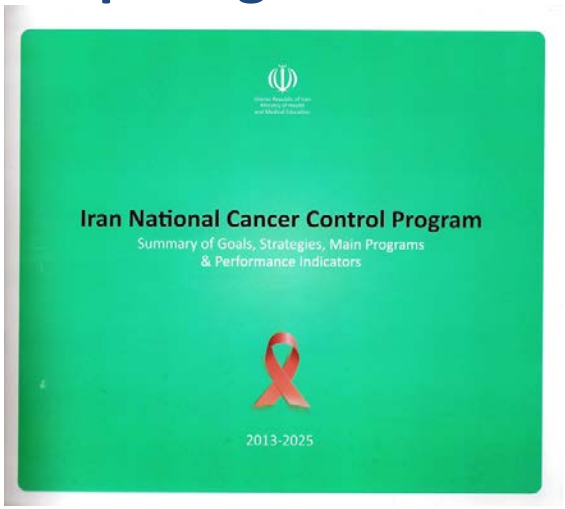


WORLD MAP OF R&D COMPANIES




F-18 FDG
I-123
I-124
Cu-64
Zr-89
C-11
N-13
O-15
Ge-68
Tl-201
Ga-67
In-111
Kr-81

Preparing the "National Cancer Control Program" (NCCP)



Main Component

01 Prevention

02 Early Detection

03 Diagnosis & Treatment

04 Supportive & Palliative Care

Supporting Component

- Governance & Policy Making
- Research & Needs Assessment
- Developing the service Delivery Network
- Developing Human Resources
- Providing & Managing Financial Resources
- Managing the Cancer Information System & Registry
- Participation of NGOs, Charities, & Private Sector

This document sets out policies, strategies, goals, and activities for cancer control and outlines the roadmap for the Ministry of Health and other organizations and institutions to manage the disease by year 2025.

ISLAMIC REPUBLIC OF IRAN

Atomic Energy Organization of Iran

Cancer Control Committee)work together with the NCCC to prepare a new report on the progress made in Iran on the implementation of 2011 imPACT recommendations to update the last report sent to PACT Division in 2013. Based on this report, the main activities carried out since 2014 and priorities for IAEA support as determined by the Ministry of Health and Medical Education (MoHME), AEOI and the NCCC experts are outlined below.

We are also expecting to receive the report of the above PACT mission shortly so that we may update our planned activities and any subsequent requests for IAEA assistance.

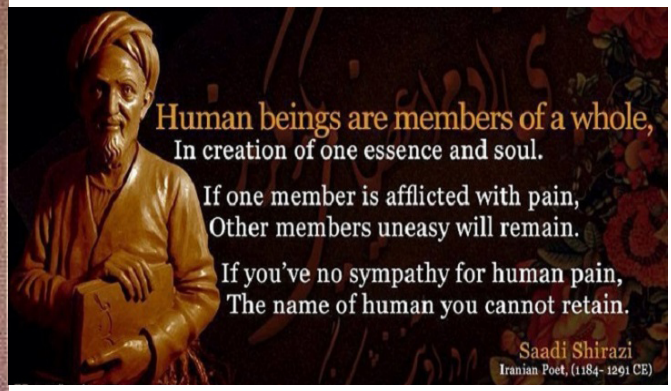
Finally, in line with the Islamic Republic of Iran's objectives in the field of the use of peaceful nuclear technology, and in particular its application to medicine and cancer control and treatment, which is one of the highest priorities of the country, I wish to offer our relevant research and training facilities as a regional designated center of competence in cancer control, radiation medicine, radioisotopes and radiopharmaceutical production. We will be pleased to accept IAEA fellowships and training candidates from developing countries for research, education and training.

Finally I would like to request, Mr. Director General, your personal attention to the above offer and in particular the list of our priorities for cooperation with the IAEA. In this manner, I continue to count on your valuable and fruitful cooperation in the fight against cancer in our region.

Accept, Mr. Director General, the assurance of my highest considerations.

Aliakbar Salehi
President

Finally, in line with the Islamic Republic of Iran's objectives in the field of the use of peaceful nuclear technology, and in particular its application to medicine and cancer control and treatment, which is one of the highest priorities of the country, I wish to offer our relevant research and training facilities as a regional designated center of competence in cancer control, radiation medicine, radioisotopes and radiopharmaceutical production. We will be pleased to accept IAEA fellowships and training candidates from developing countries for research, education and training.



Thank you
for your attention