

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2505**  
TO BE ANSWERED ON 26.12.2018

**PRODUCTION OF RADIO ISOTOPE**

2505. SHRI NARANBHAI KACHHADIYA:

SHRI BIDYUT BARAN MAHATO:

SHRI SUMEDHANAND SARSWATI:

SHRI CHANDRA PRAKASH JOSHI:

Will the PRIME MINISTER be pleased to state:

- (a) whether Cyclotron is used for production of radio isotope used for diagnostic and medical use in cancer and if so, the types of cancer in these radio isotopes are used;
- (b) whether cyclotron-30, the largest cyclotron for medical use in the country became operational this year; and
- (c) if so, the cost of its research and manufacturing?

**ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (Dr. JITENDRA SINGH):

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- (a) Yes, Sir. The radio-isotopes such as FDG ( $^{18}\text{F}$ ), Gallium ( $^{67}\text{Ga}$ ), Thallium ( $^{201}\text{Tl}$ ), Palladium ( $^{103}\text{Pd}$ ), Iodine ( $^{123}\text{I}$ ) are used for preparation of various radiopharmaceuticals, which are used for diagnostics and cancer therapy, as detailed below:-

**i)  $^{18}\text{F}$  tracers for various diagnostic purposes**

Radiopharmaceuticals	Usages
$^{18}\text{F}$ Fluro-2-deoxyglucose	Oncology, Neuro
$^{18}\text{F}$ Fluoride ( $\text{Na}^{18}\text{F}$ )	Bone Metastasis
$^{18}\text{F}$ Fluorothymidine	Brain tumor, Osteosarcoma
2- $^{18}\text{F}$ Fluorotyrosine	Cellular aminoacid transport tumor
$^{18}\text{F}$ Fluorocholine	Prostate carcinoma, soft tissue metastases
$^{18}\text{F}$ FMIZO/ $^{18}\text{F}$ FAZA	Hypoxia, therapy planning
$^{18}\text{F}$ Fluoroestradiol	Hormone receptor status in breast cancer
$^{18}\text{F}$ FD OPA	NETs and pancreatic b cell hyperplasia

**ii) Other important radioisotopes for diagnostic and therapeutic uses**

Gallium-67	Gallium-67 scintigraphy may include regional, whole-body, planar, and single photon emission computed tomography (SPECT) scintigrams, or any combination performed after intravenous injection of <sup>67</sup> Ga-citrate for Soft tissue tumor imaging.
Thallium-201	Thallium-201 Chloride is a radiopharmaceutical used in myocardial perfusion imaging (MPI) using either planar or single photon emission computed tomography (SPECT) techniques for the diagnosis and localization of myocardial infarction.
Paladium-103	Prostate cancer therapy
Iodine-123	Single photon emission computed tomography (SPECT) for thyroid cancer imaging and detection of primary or metastatic pheochromocytoma

(b)&(c) Yes, Sir. The total cost of complete cyclotron systems is Rs.156.22 crore.

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