

Electronic Data and ICRP Dose Viewer App

Martin Andersson, ICRP C2 member

TG36 WORKSHOP | 29 JULY 2025 | 12:00 - 14:00 UTC

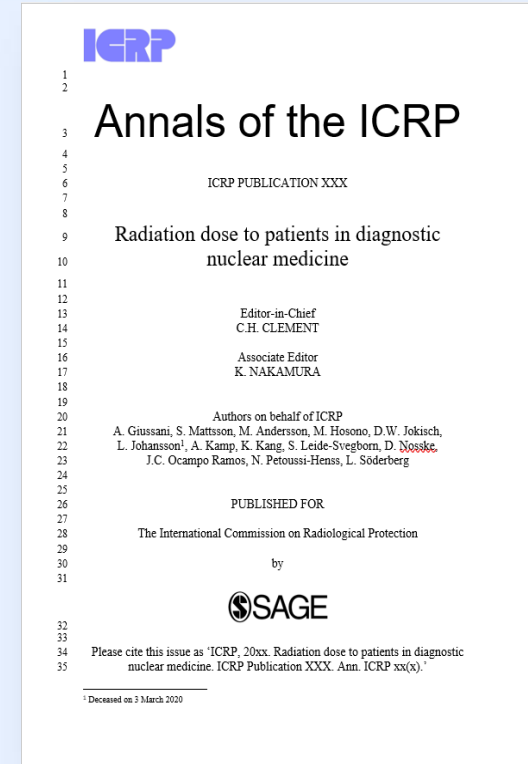
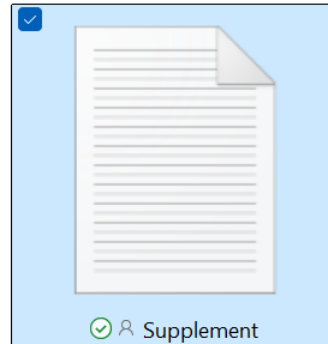
**RADIATION DOSE TO PATIENTS IN
DIAGNOSTIC NUCLEAR MEDICINE**



Supplemental Material

Supplemental Material

- **Electronic Data to publication**
 - A text file (CVS) will available
- The supplemental file will include:
 1. Biokinetic model (transfer rates)
 2. Time-integrated activity coefficients (TIAC)
 3. Absorbed dose & Effective dose



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[Other Resources](#)

[Supplemental Material](#)

File structure of supplement file

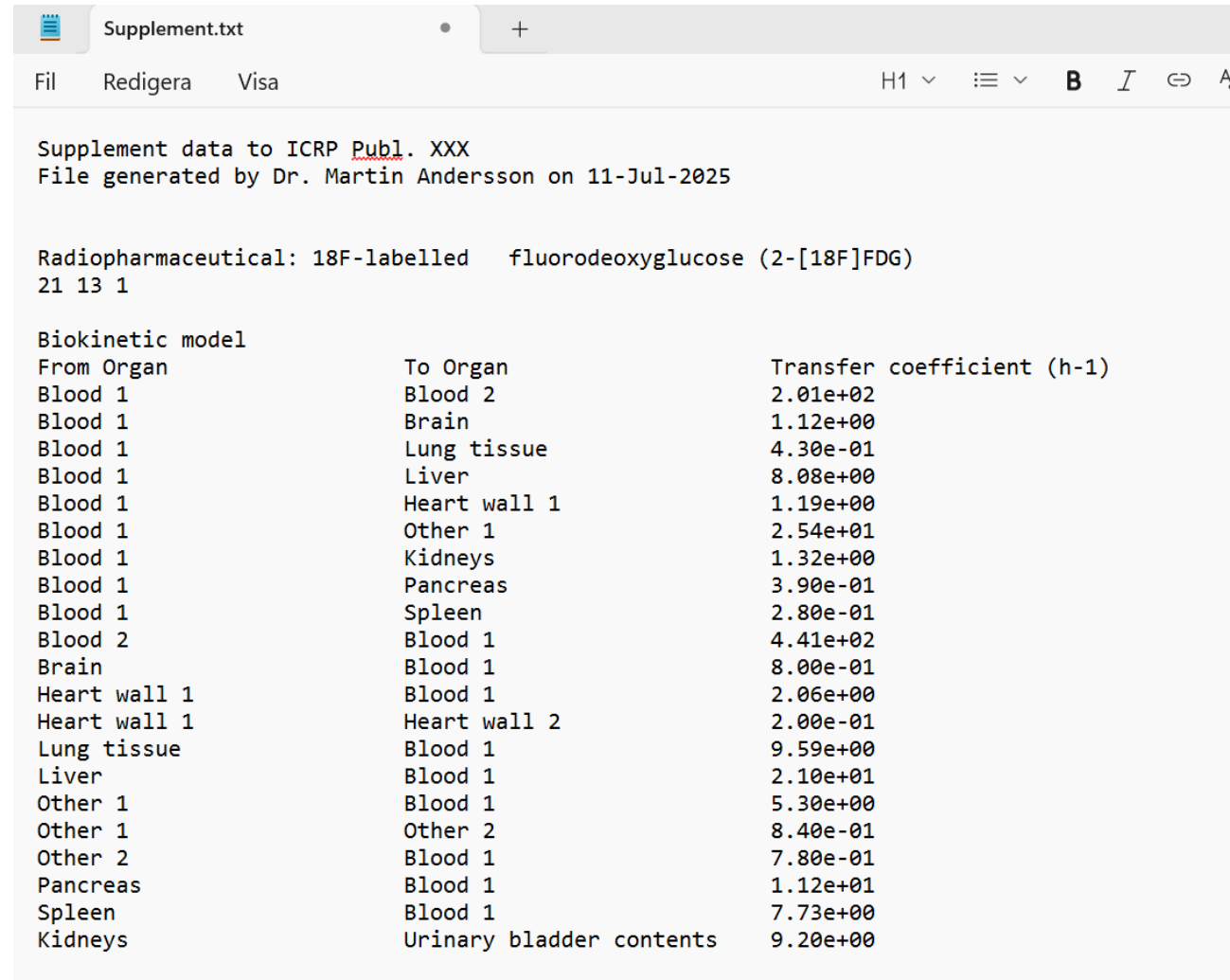
Biokinetic model

General structure

- XX= number of transfer rates
- YY= number of compartments
- ZZ= number of age classes considered

For 2-[18F]FDG

- 21= number of transfer rates
- 13= number of compartments
- 1= number of age classes considered



The screenshot shows a text editor window titled 'Supplement.txt'. The content is as follows:

```
Supplement data to ICRP Publ. XXX
File generated by Dr. Martin Andersson on 11-Jul-2025

Radiopharmaceutical: 18F-labelled fluorodeoxyglucose (2-[18F]FDG)
21 13 1

Biokinetic model
From Organ      To Organ      Transfer coefficient (h-1)
Blood 1         Blood 2        2.01e+02
Blood 1         Brain          1.12e+00
Blood 1         Lung tissue    4.30e-01
Blood 1         Liver          8.08e+00
Blood 1         Heart wall 1   1.19e+00
Blood 1         Other 1        2.54e+01
Blood 1         Kidneys        1.32e+00
Blood 1         Pancreas       3.90e-01
Blood 1         Spleen         2.80e-01
Blood 2         Blood 1        4.41e+02
Brain           Blood 1        8.00e-01
Heart wall 1    Blood 1        2.06e+00
Heart wall 1    Heart wall 2   2.00e-01
Lung tissue     Blood 1        9.59e+00
Liver           Blood 1        2.10e+01
Other 1         Blood 1        5.30e+00
Other 1         Other 2        8.40e-01
Other 2         Blood 1        7.80e-01
Pancreas        Blood 1        1.12e+01
Spleen          Blood 1        7.73e+00
Kidneys         Urinary bladder contents 9.20e+00
```

File structure of supplement file

Time-integrated activity coefficients (TIAC)

| Time-integrated activity coefficients (TIAC) | |
|--|-----------|
| Source organ | MBq-h/MBq |
| Blood | 2.78e-01 |
| Brain | 1.82e-01 |
| Lung tissue | 8.25e-03 |
| Liver | 7.23e-02 |
| Heart wall | 1.32e-01 |
| Other | 1.28e+00 |
| Kidneys | 2.63e-02 |
| Pancreas | 6.44e-03 |
| Spleen | 6.60e-03 |

| TIAC in urinary bladder [MBq-h/MBq] | Adult male | Adult female | 15-years male | 15-years female |
|-------------------------------------|------------|--------------|---------------|-----------------|
| Dynamic bladder act. | 3.00e-01 | 3.20e-01 | 3.20e-01 | 3.00e-01 |

Absorbed doses [mGy/MBq]

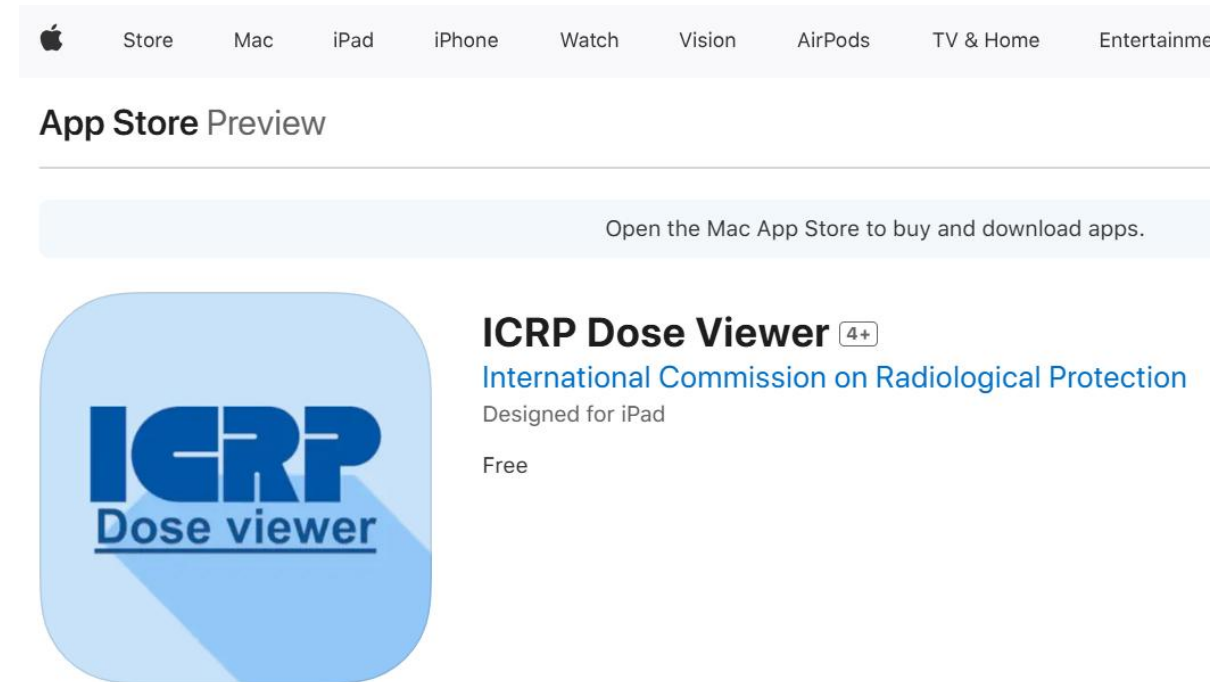
| Dose coefficient Organs [mGy/MBq] | Adult Male | Adult Female | 15-years male | 15-years Female | 10-years Male | 10-years Female | 5-years Male | 5-years Female | 1-year Male | 1-year female | Infant (100 d) Male | Infant (100 d) female |
|--------------------------------------|------------|--------------|---------------|-----------------|---------------|-----------------|--------------|----------------|-------------|---------------|---------------------|-----------------------|
| Adipose/residual tissue | 8.44E-03 | 9.29E-03 | 1.04E-02 | 1.09E-02 | 1.68E-02 | 2.19E-02 | 2.71E-02 | 2.69E-02 | 4.93E-02 | 4.93E-02 | 8.36E-02 | 8.32E-02 |
| Adrenals | 1.35E-02 | 1.60E-02 | 1.21E-02 | 1.34E-02 | 2.03E-02 | 2.02E-02 | 3.44E-02 | 3.43E-02 | 6.54E-02 | 6.53E-02 | 8.35E-02 | 8.32E-02 |
| Alveolar-interstitial | 1.42E-02 | 1.71E-02 | 1.53E-02 | 1.86E-02 | 2.57E-02 | 2.57E-02 | 3.85E-02 | 3.87E-02 | 7.89E-02 | 7.90E-02 | 1.19E-01 | 1.19E-01 |
| Brain | 2.99E-02 | 3.32E-02 | 3.49E-02 | 3.78E-02 | 3.72E-02 | 4.14E-02 | 4.09E-02 | 4.47E-02 | 5.59E-02 | 5.59E-02 | 7.96E-02 | 7.96E-02 |
| Breast | 7.63E-03 | 9.70E-03 | 9.15E-03 | 1.02E-02 | 1.44E-02 | 1.36E-02 | 2.47E-02 | 2.44E-02 | 4.24E-02 | 4.20E-02 | 7.38E-02 | 7.34E-02 |
| Bronchi bound | 1.29E-02 | 1.90E-02 | 1.18E-02 | 1.30E-02 | 1.70E-02 | 1.69E-02 | 2.68E-02 | 2.67E-02 | 4.70E-02 | 4.70E-02 | 6.82E-02 | 6.82E-02 |
| Bronchi sequestered | 1.29E-02 | 1.89E-02 | 1.18E-02 | 1.30E-02 | 1.70E-02 | 1.69E-02 | 2.68E-02 | 2.67E-02 | 4.70E-02 | 4.70E-02 | 6.82E-02 | 6.82E-02 |
| Bronchioles | 1.09E-02 | 1.33E-02 | 1.04E-02 | 1.17E-02 | 1.68E-02 | 1.68E-02 | 2.56E-02 | 2.58E-02 | 4.80E-02 | 4.80E-02 | 7.06E-02 | 7.06E-02 |
| Colon wall | 1.21E-02 | 1.52E-02 | 1.51E-02 | 1.36E-02 | 2.21E-02 | 2.15E-02 | 3.67E-02 | 3.51E-02 | 7.16E-02 | 7.03E-02 | 9.92E-02 | 9.69E-02 |
| Endosteum (bone surface) | 1.02E-02 | 1.24E-02 | 1.55E-02 | 1.58E-02 | 2.43E-02 | 2.40E-02 | 4.46E-02 | 4.40E-02 | 8.91E-02 | 8.90E-02 | 1.15E-01 | 1.15E-01 |
| ET region | 7.55E-03 | 8.53E-03 | 2.00E-02 | 1.96E-02 | 2.48E-02 | 2.47E-02 | 2.88E-02 | 2.87E-02 | 4.02E-02 | 4.02E-02 | 5.79E-02 | 5.80E-02 |
| ET1 basal cells | 4.60E-03 | 6.24E-03 | 1.52E-02 | 1.56E-02 | 2.32E-02 | 2.31E-02 | 3.63E-02 | 3.61E-02 | 7.12E-02 | 7.13E-02 | 7.43E-02 | 7.43E-02 |
| ET2 basal cells | 7.55E-03 | 8.54E-03 | 2.00E-02 | 1.96E-02 | 2.48E-02 | 2.47E-02 | 2.88E-02 | 2.87E-02 | 4.02E-02 | 4.02E-02 | 5.79E-02 | 5.80E-02 |
| Eye lenses | 7.00E-03 | 7.84E-03 | 1.37E-02 | 1.44E-02 | 1.97E-02 | 1.96E-02 | 2.48E-02 | 2.46E-02 | 3.69E-02 | 3.68E-02 | 5.47E-02 | 5.46E-02 |
| Gallbladder wall | 1.12E-02 | 1.31E-02 | 1.14E-02 | 1.38E-02 | 1.76E-02 | 1.77E-02 | 2.88E-02 | 2.88E-02 | 4.94E-02 | 4.95E-02 | 7.15E-02 | 7.15E-02 |
| Heart wall | 6.48E-02 | 8.38E-02 | 8.29E-02 | 9.05E-02 | 1.36E-01 | 1.36E-01 | 2.18E-01 | 2.18E-01 | 3.91E-01 | 3.91E-01 | 5.75E-01 | 5.75E-01 |
| Kidneys | 1.98E-02 | 2.33E-02 | 2.16E-02 | 2.38E-02 | 3.20E-02 | 3.20E-02 | 5.28E-02 | 5.28E-02 | 8.87E-02 | 8.87E-02 | 1.30E-01 | 1.29E-01 |
| Left colon wall | 9.85E-03 | 1.35E-02 | 9.81E-03 | 1.06E-02 | 1.60E-02 | 1.61E-02 | 2.87E-02 | 2.96E-02 | 5.68E-02 | 5.67E-02 | 8.81E-02 | 8.78E-02 |
| Liver | 1.49E-02 | 1.81E-02 | 1.68E-02 | 1.95E-02 | 2.79E-02 | 2.79E-02 | 4.24E-02 | 4.25E-02 | 7.38E-02 | 7.38E-02 | 1.04E-01 | 1.04E-01 |
| Lung | 1.27E-02 | 1.65E-02 | 1.25E-02 | 1.44E-02 | 1.98E-02 | 1.98E-02 | 3.03E-02 | 3.04E-02 | 5.80E-02 | 5.80E-02 | 8.60E-02 | 8.60E-02 |
| Lymphatic nodes | 1.29E-02 | 1.43E-02 | 1.21E-02 | 1.21E-02 | 1.76E-02 | 1.76E-02 | 3.01E-02 | 3.00E-02 | 5.12E-02 | 5.12E-02 | 7.35E-02 | 7.35E-02 |
| Lymph nodes in ET region | 8.43E-03 | 1.00E-02 | 2.18E-02 | 2.01E-02 | 2.54E-02 | 2.53E-02 | 3.61E-02 | 3.59E-02 | 5.16E-02 | 5.16E-02 | 8.19E-02 | 8.19E-02 |
| Lymph nodes in sys | 1.33E-02 | 1.46E-02 | 1.10E-02 | 1.10E-02 | 1.66E-02 | 1.66E-02 | 2.89E-02 | 2.88E-02 | 5.04E-02 | 5.04E-02 | 7.15E-02 | 7.15E-02 |
| Lymph nodes in thoracic region | 1.35E-02 | 1.54E-02 | 1.35E-02 | 1.53E-02 | 2.03E-02 | 2.02E-02 | 3.72E-02 | 3.72E-02 | 6.01E-02 | 6.01E-02 | 8.68E-02 | 8.68E-02 |
| Muscle | 8.28E-03 | 1.01E-02 | 9.72E-03 | 1.00E-02 | 1.57E-02 | 1.55E-02 | 2.56E-02 | 2.54E-02 | 4.81E-02 | 4.80E-02 | 7.24E-02 | 7.22E-02 |
| Oesophagus | 1.48E-02 | 1.70E-02 | 1.56E-02 | 1.56E-02 | 2.46E-02 | 2.46E-02 | 4.01E-02 | 4.01E-02 | 6.72E-02 | 6.72E-02 | 9.45E-02 | 9.45E-02 |
| Oral mucosa | 8.76E-03 | 9.94E-03 | 2.02E-02 | 1.99E-02 | 2.71E-02 | 2.71E-02 | 3.28E-02 | 3.28E-02 | 4.95E-02 | 4.97E-02 | 8.42E-02 | 8.45E-02 |
| Ovaries | 0.00E+00 | 2.37E-02 | 0.00E+00 | 3.71E-02 | 0.00E+00 | 4.96E-02 | 0.00E+00 | 7.28E-02 | 0.00E+00 | 1.16E-01 | 0.00E+00 | 1.28E-01 |
| Pancreas | 1.60E-02 | 1.82E-02 | 1.65E-02 | 1.88E-02 | 2.75E-02 | 2.76E-02 | 4.52E-02 | 4.53E-02 | 7.91E-02 | 7.91E-02 | 1.23E-01 | 1.23E-01 |
| Pituitary gland | 1.70E-02 | 1.87E-02 | 2.51E-02 | 2.60E-02 | 3.16E-02 | 3.16E-02 | 3.86E-02 | 3.88E-02 | 5.57E-02 | 5.63E-02 | 8.42E-02 | 8.51E-02 |
| Prostate | 2.70E-02 | 0.00E+00 | 3.04E-02 | 0.00E+00 | 5.22E-02 | 0.00E+00 | 7.41E-02 | 0.00E+00 | 1.37E-01 | 0.00E+00 | 1.54E-01 | 0.00E+00 |
| Recto-sigmoid colon wall | 1.95E-02 | 2.31E-02 | 2.46E-02 | 1.84E-02 | 3.10E-02 | 2.71E-02 | 5.08E-02 | 4.01E-02 | 1.06E-01 | 1.00E-01 | 1.29E-01 | 1.19E-01 |
| Red (active) bone marrow | 1.45E-02 | 1.84E-02 | 1.76E-02 | 1.89E-02 | 2.52E-02 | 2.50E-02 | 3.86E-02 | 3.81E-02 | 6.77E-02 | 6.76E-02 | 1.03E-01 | 1.03E-01 |
| Right colon wall | 1.06E-02 | 1.30E-02 | 1.57E-02 | 1.42E-02 | 2.39E-02 | 2.41E-02 | 3.76E-02 | 3.80E-02 | 6.89E-02 | 6.89E-02 | 9.52E-02 | 9.49E-02 |
| Salivary glands | 7.79E-03 | 9.73E-03 | 2.06E-02 | 1.87E-02 | 2.48E-02 | 2.46E-02 | 3.29E-02 | 3.27E-02 | 5.24E-02 | 5.24E-02 | 8.91E-02 | 8.91E-02 |
| Skin | 6.30E-03 | 7.64E-03 | 7.97E-03 | 8.63E-03 | 1.34E-02 | 1.34E-02 | 2.22E-02 | 2.22E-02 | 4.18E-02 | 4.18E-02 | 6.26E-02 | 6.26E-02 |
| Small intestine wall | 1.29E-02 | 1.69E-02 | 1.24E-02 | 1.31E-02 | 1.80E-02 | 1.88E-02 | 3.32E-02 | 3.52E-02 | 6.26E-02 | 6.28E-02 | 8.78E-02 | 8.63E-02 |
| Spleen | 1.44E-02 | 1.70E-02 | 1.41E-02 | 1.64E-02 | 2.34E-02 | 2.34E-02 | 3.81E-02 | 3.81E-02 | 7.04E-02 | 7.04E-02 | 1.04E-01 | 1.04E-01 |
| Stomach wall | 1.21E-02 | 1.34E-02 | 1.11E-02 | 1.25E-02 | 1.84E-02 | 1.84E-02 | 3.07E-02 | 3.07E-02 | 5.76E-02 | 5.76E-02 | 8.14E-02 | 8.12E-02 |
| Testes | 8.60E-03 | 0.00E+00 | 1.91E-02 | 0.00E+00 | 2.42E-02 | 0.00E+00 | 3.85E-02 | 0.00E+00 | 5.47E-02 | 0.00E+00 | 7.20E-02 | 0.00E+00 |
| Thymus | 9.80E-03 | 1.22E-02 | 1.38E-02 | 1.45E-02 | 2.16E-02 | 2.15E-02 | 3.59E-02 | 3.58E-02 | 6.95E-02 | 6.95E-02 | 9.96E-02 | 9.97E-02 |
| Thyroid | 9.09E-03 | 1.09E-02 | 1.25E-02 | 1.27E-02 | 1.85E-02 | 1.84E-02 | 3.20E-02 | 3.18E-02 | 5.35E-02 | 5.34E-02 | 7.72E-02 | 7.71E-02 |
| Tongue | 6.98E-03 | 7.58E-03 | 1.74E-02 | 1.58E-02 | 2.07E-02 | 2.07E-02 | 2.50E-02 | 2.49E-02 | 3.42E-02 | 3.42E-02 | 5.10E-02 | 5.11E-02 |
| Tonsils | 1.08E-02 | 1.03E-02 | 2.26E-02 | 2.04E-02 | 2.84E-02 | 2.82E-02 | 3.64E-02 | 3.61E-02 | 5.13E-02 | 5.12E-02 | 9.20E-02 | 9.20E-02 |
| Ureters | 1.41E-02 | 1.59E-02 | 1.53E-02 | 1.64E-02 | 2.35E-02 | 3.14E-02 | 3.87E-02 | 3.84E-02 | 6.95E-02 | 6.80E-02 | 1.02E-01 | 9.24E-02 |
| Urinary bladder wall | 7.26E-02 | 8.92E-02 | 8.84E-02 | 8.88E-02 | 1.41E-01 | 1.41E-01 | 1.80E-01 | 1.80E-01 | 2.63E-01 | 2.63E-01 | 3.40E-01 | 3.39E-01 |
| Uterus/cervix | 0.00E+00 | 3.22E-02 | 0.00E+00 | 8.88E-02 | 0.00E+00 | 1.24E-01 | 0.00E+00 | 8.59E-02 | 0.00E+00 | 3.24E-01 | 0.00E+00 | 3.13E-01 |
| Remainder tissues | 9.26E-03 | 1.17E-02 | 1.10E-02 | 1.20E-02 | 1.81E-02 | 1.80E-02 | 2.96E-02 | 2.94E-02 | 5.81E-02 | 5.82E-02 | 8.64E-02 | 8.72E-02 |
| Effective dose 103 [mSv/MBq] | 1.71E-02 | | 1.95E-02 | | 2.87E-02 | | 4.31E-02 | | 7.50E-02 | | 1.06E-01 | |

ICRP Dose Viewer App

ICRP Dose Viewer App

All electronic data will also be available in the ICRP Dose Viewer

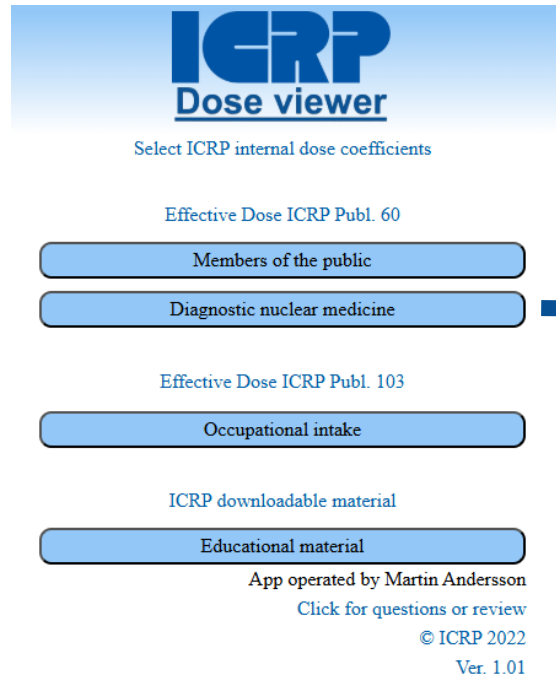
- the ICRP Dose Viewer is an App which can be downloaded through:
 - App Store (iPhone) or
 - Google play (Android)



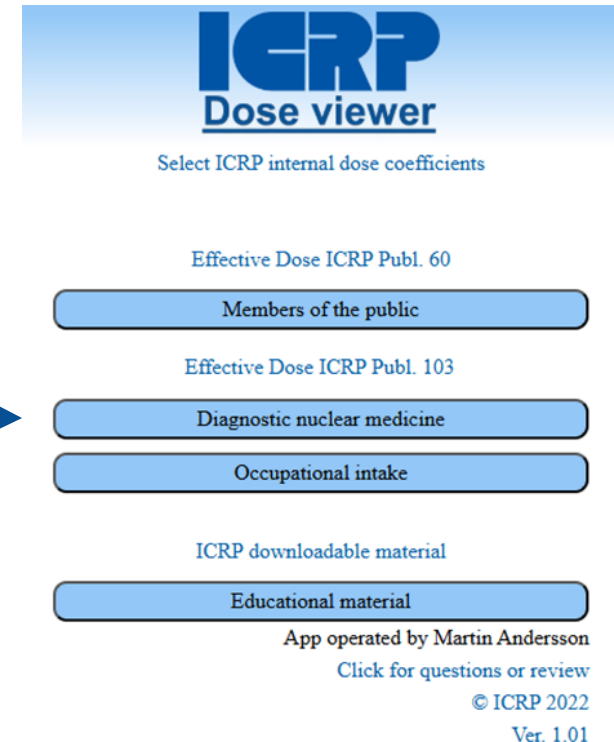
the ICRP Dose Viewer on App Store

ICRP Dose Viewer App

Current version of the ICRP app
Dose values from ICRP P128



Next version of the ICRP app
Dose values from new publication



ICRP Dose Viewer App

Select Element

ICRP
Dose viewer

Administration to patients in diagnostic nuclear medicine

Select Element

Choose...
Choose...
C Carbon
Cr Chromium
F Fluorine
Ga Gallium
H Hydrogen
I Iodine
In Indium
O Oxygen
Rb Rubidium
Se Selenium
Tc Technetium
Tl Thallium
Xe Xenon

Database of ICRP P.128
Database v1.1 2020-10-04

License

Info

Select Radiopharmaceutical

ICRP
Dose viewer

Administration to patients in diagnostic nuclear medicine

Element: F Fluorine

Select Radiopharmaceutical

Choose...
Choose...
18-F DOPA
18-F FDG
18-F FLT
18F FET
18F-choline
18F-fluoride
18F-labelled amino acids (generic model)
18F-labelled brain receptor substances (generic model)

Select age

ICRP
Dose viewer

Administration to patients in diagnostic nuclear medicine

Element: F Fluorine

Radiopharmaceutical: 18-F FDG

Select Age

Choose...
Choose...
Adult
Fifteen years
Ten years
Five years
One year

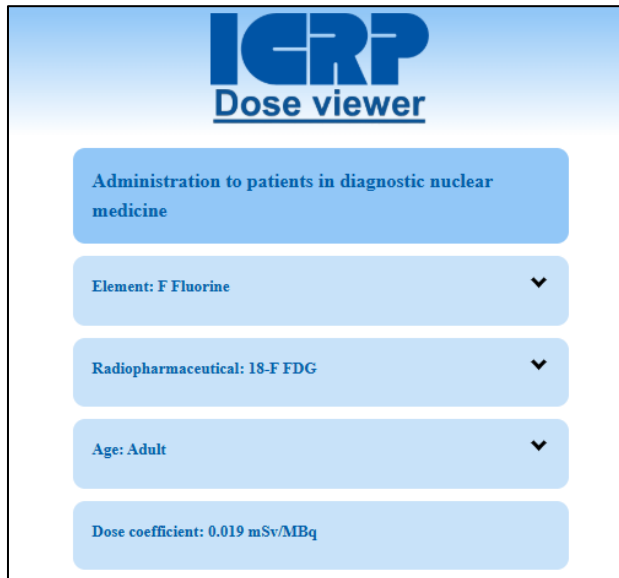
Database of ICRP P.128
Database v1.1 2020-10-04

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Info

ICRP Dose Viewer App

Effective dose coefficient



ICRP
Dose viewer

Administration to patients in diagnostic nuclear medicine

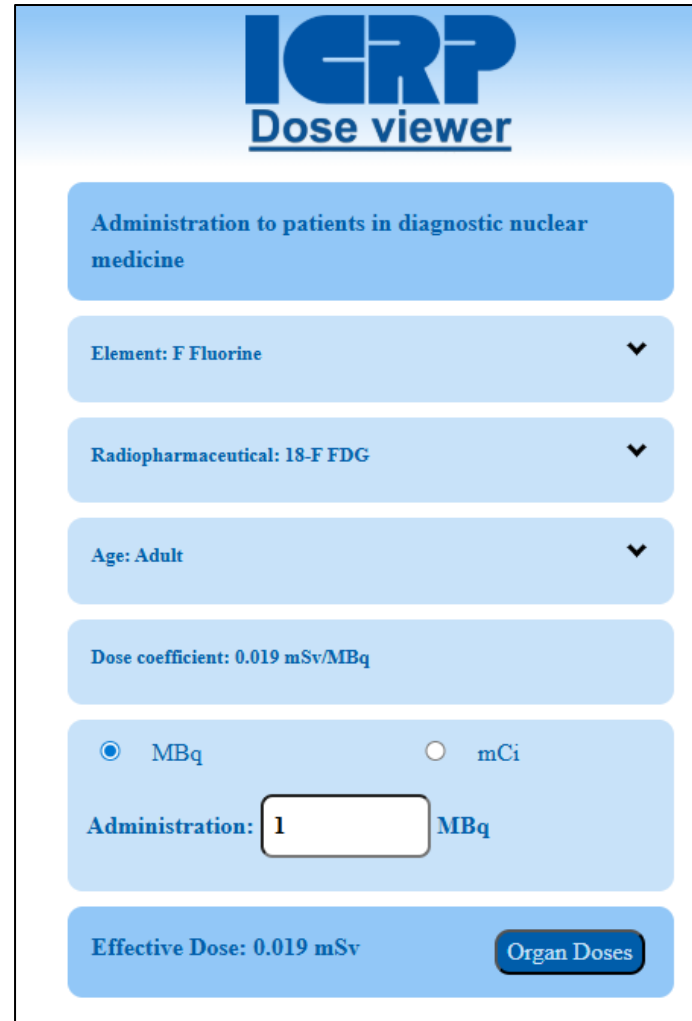
Element: F Fluorine ▼

Radiopharmaceutical: 18-F FDG ▼

Age: Adult ▼

Dose coefficient: 0.019 mSv/MBq

Administration and organ doses



ICRP
Dose viewer

Administration to patients in diagnostic nuclear medicine

Element: F Fluorine ▼

Radiopharmaceutical: 18-F FDG ▼

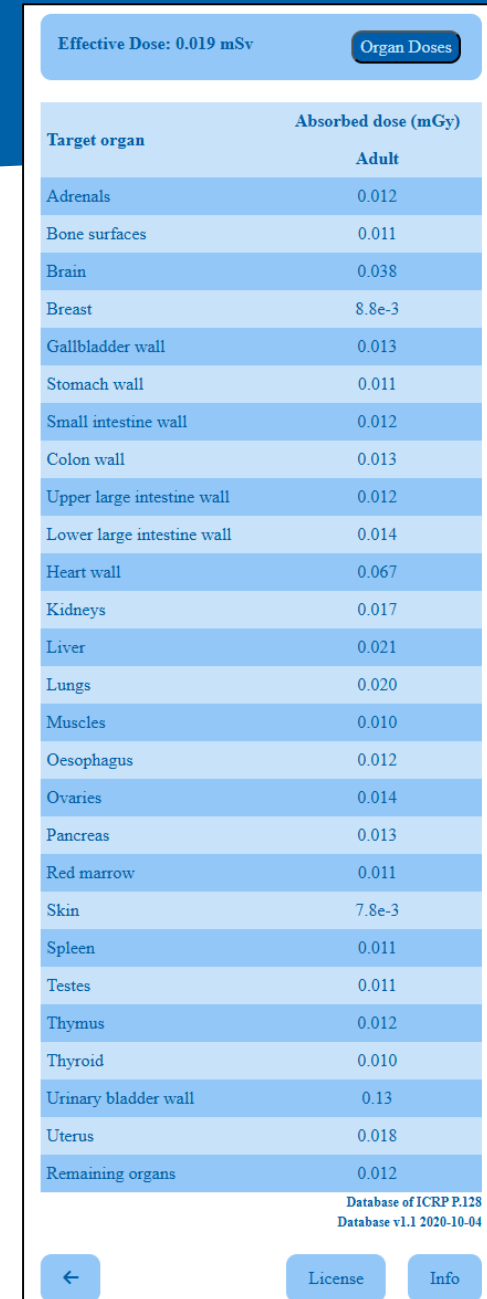
Age: Adult ▼

Dose coefficient: 0.019 mSv/MBq

☒ MBq ☐ mCi

Administration: 1 MBq

Effective Dose: 0.019 mSv [Organ Doses](#)



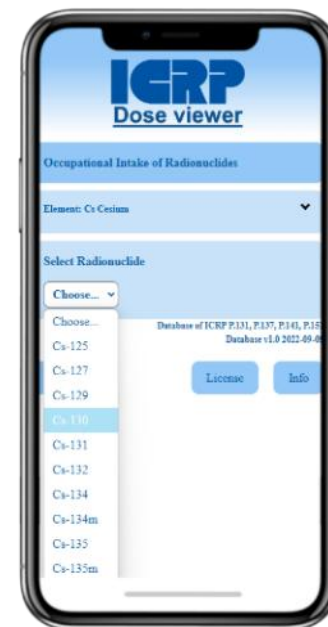
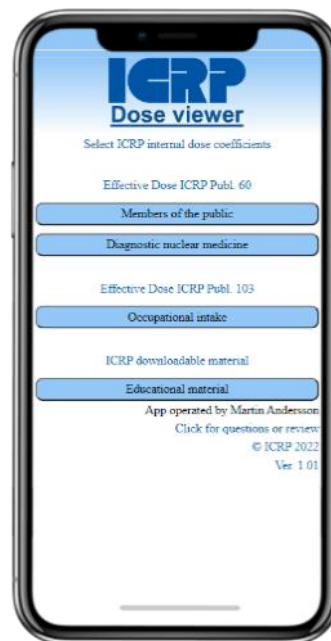
Effective Dose: 0.019 mSv [Organ Doses](#)

| Target organ | Absorbed dose (mGy) |
|----------------------------|---------------------|
| Adrenals | 0.012 |
| Bone surfaces | 0.011 |
| Brain | 0.038 |
| Breast | 8.8e-3 |
| Gallbladder wall | 0.013 |
| Stomach wall | 0.011 |
| Small intestine wall | 0.012 |
| Colon wall | 0.013 |
| Upper large intestine wall | 0.012 |
| Lower large intestine wall | 0.014 |
| Heart wall | 0.067 |
| Kidneys | 0.017 |
| Liver | 0.021 |
| Lungs | 0.020 |
| Muscles | 0.010 |
| Oesophagus | 0.012 |
| Ovaries | 0.014 |
| Pancreas | 0.013 |
| Red marrow | 0.011 |
| Skin | 7.8e-3 |
| Spleen | 0.011 |
| Testes | 0.011 |
| Thymus | 0.012 |
| Thyroid | 0.010 |
| Urinary bladder wall | 0.13 |
| Uterus | 0.018 |
| Remaining organs | 0.012 |

Database of ICRP P.128
Database v1.1 2020-10-04

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ICRP Dose Viewer App



ICRP

www.icrp.org