Nuclear Medicine Decay and Activity Chart

mCi ↔ MBq tables and decay factors for Tc-99m, F-18, Ga-68, I-123, I-131 and Lu-177

For: Nuclear medicine technologists and students, radiopharmacists and medical physicists

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EXACT DEFINITION	FORMULA	REVERSE	WORKED EXAMPLE
1 mCi = 37 MBq exactly (1 Ci = 3.7×10^{10} Bq)	$A = A_0 \times 2^{(-t \div T½)}$	$t = T½ \times \log_2(A_0 \div A)$	Tc-99m: after 3 h, $2^{(-3 \div 6.0072)} = 0.7074$, so 70.7% remains

Decay fractions to 4 decimal places. Half-lives from the IAEA Live Chart of Nuclides (ENSDF).

Half-lives of common medical radionuclides

Nuclide	Half-life	Decay constant λ	Typical use
F-18	109.77 min	0.3789 per hour	PET imaging (FDG and other tracers)
Ga-68	67.71 min	0.6142 per hour	PET imaging (PSMA, somatostatin receptors)
Tc-99m	6.0072 h	0.1154 per hour	SPECT and planar imaging (bone, cardiac, renal, thyroid)
I-123	13.2230 h	0.05242 per hour	Thyroid imaging and uptake
Y-90	64.05 h	0.01082 per hour	Liver radioembolisation
In-111	2.8047 d	0.0103 per hour	SPECT (labelled white cells, octreotide)
Tl-201	3.0420 d	0.009494 per hour	Myocardial perfusion (legacy)
Ga-67	3.2617 d	0.008855 per hour	Infection and lymphoma imaging
Xe-133	5.2475 d	0.005504 per hour	Lung ventilation imaging
Lu-177	6.6443 d	0.004347 per hour	Radionuclide therapy (PSMA, somatostatin receptors)
I-131	8.0252 d	0.003599 per hour	Thyroid therapy and imaging

Millicuries to megabecquerels

Millicuries (mCi)	Megabecquerels (MBq)	Gigabecquerels (GBq)
0.1	3.7	0.0037
0.25	9.25	0.0093
0.5	18.5	0.0185
1	37	0.037
2	74	0.074
3	111	0.111
4	148	0.148
5	185	0.185
6	222	0.222
8	296	0.296

Millicuries (mCi)	Megabecquerels (MBq)	Gigabecquerels (GBq)
10	370	0.37
12	444	0.444
15	555	0.555
20	740	0.74
25	925	0.925
30	1,110	1.11
40	1,480	1.48
50	1,850	1.85
100	3,700	3.7
200	7,400	7.4

Megabecquerels to millicuries

Megabecquerels (MBq)	Millicuries (mCi)
1	0.027
10	0.27
37	1
50	1.351
74	2
100	2.703
150	4.054

Megabecquerels (MBq)	Millicuries (mCi)
370	10
400	10.811
500	13.514
555	15
740	20
925	25
1,000	27.027

Megabecquerels (MBq)	Millicuries (mCi)
185	5
200	5.405
250	6.757

Megabecquerels (MBq)	Millicuries (mCi)
1,110	30
3,700	100
7,400	200

Tc-99m decay (half-life 6.0072 h)

Hours elapsed	Fraction remaining	Percent remaining
0	1.0000	100.0
0.5	0.9439	94.4
1	0.8910	89.1
1.5	0.8411	84.1
2	0.7939	79.4
2.5	0.7494	74.9
3	0.7074	70.7
3.5	0.6677	66.8
4	0.6303	63.0
4.5	0.5950	59.5
5	0.5616	56.2
5.5	0.5301	53.0
6	0.5004	50.0
6.5	0.4724	47.2
7	0.4459	44.6
7.5	0.4209	42.1
8	0.3973	39.7

Hours elapsed	Fraction remaining	Percent remaining
8.5	0.3750	37.5
9	0.3540	35.4
9.5	0.3341	33.4
10	0.3154	31.5
10.5	0.2977	29.8
11	0.2810	28.1
11.5	0.2653	26.5
12	0.2504	25.0
12.5	0.2364	23.6
13	0.2231	22.3
13.5	0.2106	21.1
14	0.1988	19.9
14.5	0.1877	18.8
15	0.1771	17.7
15.5	0.1672	16.7
16	0.1578	15.8
16.5	0.1490	14.9

Hours elapsed	Fraction remaining	Percent remaining
17	0.1406	14.1
17.5	0.1328	13.3
18	0.1253	12.5
18.5	0.1183	11.8
19	0.1117	11.2
19.5	0.1054	10.5
20	0.0995	9.9
20.5	0.0939	9.4
21	0.0886	8.9
21.5	0.0837	8.4
22	0.0790	7.9
22.5	0.0746	7.5
23	0.0704	7.0
23.5	0.0664	6.6
24	0.0627	6.3

F-18 decay (half-life 109.77 min)

Minutes elapsed	Fraction remaining	Percent remaining
0	1.0000	100.0
10	0.9388	93.9
20	0.8814	88.1
30	0.8274	82.7
40	0.7768	77.7
50	0.7293	72.9
60	0.6846	68.5
70	0.6427	64.3
80	0.6034	60.3
90	0.5665	56.6
100	0.5318	53.2
110	0.4993	49.9
120	0.4687	46.9
130	0.4400	44.0
140	0.4131	41.3
150	0.3878	38.8

Minutes elapsed	Fraction remaining	Percent remaining
160	0.3641	36.4
170	0.3418	34.2
180	0.3209	32.1
190	0.3013	30.1
200	0.2828	28.3
210	0.2655	26.6
220	0.2493	24.9
230	0.2340	23.4
240	0.2197	22.0
250	0.2063	20.6
260	0.1936	19.4
270	0.1818	18.2
280	0.1707	17.1
290	0.1602	16.0
300	0.1504	15.0

Ga-68 decay (half-life 67.71 min)

Minutes elapsed	Fraction remaining	Percent remaining
0	1.0000	100.0
10	0.9027	90.3

Minutes elapsed	Fraction remaining	Percent remaining
130	0.2643	26.4
140	0.2385	23.9

Minutes elapsed	Fraction remaining	Percent remaining
20	0.8149	81.5
30	0.7356	73.6
40	0.6640	66.4
50	0.5994	59.9
60	0.5411	54.1
70	0.4884	48.8
80	0.4409	44.1
90	0.3980	39.8
100	0.3593	35.9
110	0.3243	32.4
120	0.2927	29.3

Minutes elapsed	Fraction remaining	Percent remaining
150	0.2153	21.5
160	0.1944	19.4
170	0.1755	17.5
180	0.1584	15.8
190	0.1430	14.3
200	0.1291	12.9
210	0.1165	11.7
220	0.1052	10.5
230	0.0949	9.5
240	0.0857	8.6

I-123 decay (half-life 13.2230 h)

Hours elapsed	Fraction remaining	Percent remaining
0	1.0000	100.0
2	0.9005	90.0
4	0.8108	81.1
6	0.7301	73.0
8	0.6575	65.7
10	0.5920	59.2
12	0.5331	53.3
14	0.4800	48.0
16	0.4323	43.2
18	0.3892	38.9
20	0.3505	35.0
22	0.3156	31.6
24	0.2842	28.4

Hours elapsed	Fraction remaining	Percent remaining
26	0.2559	25.6
28	0.2304	23.0
30	0.2075	20.8
32	0.1869	18.7
34	0.1683	16.8
36	0.1515	15.2
38	0.1364	13.6
40	0.1228	12.3
42	0.1106	11.1
44	0.0996	10.0
46	0.0897	9.0
48	0.0808	8.1

I-131 decay (half-life 8.0252 d)

Days elapsed	Fraction remaining	Percent remaining
0	1.0000	100.0
2	0.8414	84.1
4	0.7079	70.8
6	0.5956	59.6
8	0.5011	50.1
10	0.4216	42.2
12	0.3547	35.5
14	0.2984	29.8
16	0.2511	25.1
18	0.2113	21.1
20	0.1777	17.8
22	0.1495	15.0
24	0.1258	12.6
26	0.1059	10.6
28	0.0891	8.9

Days elapsed	Fraction remaining	Percent remaining
30	0.0749	7.5
32	0.0630	6.3
34	0.0530	5.3
36	0.0446	4.5
38	0.0375	3.8
40	0.0316	3.2
42	0.0266	2.7
44	0.0224	2.2
46	0.0188	1.9
48	0.0158	1.6
50	0.0133	1.3
52	0.0112	1.1
54	0.0094	0.9
56	0.0079	0.8

Lu-177 decay (half-life 6.6443 d)

Days elapsed	Fraction remaining	Percent remaining	Days elapsed	Fraction remaining	Percent remaining
0	1.0000	100.0	**22**	0.1008	10.1
2	0.8117	81.2	**24**	0.0818	8.2
4	0.6588	65.9	**26**	0.0664	6.6
6	0.5348	53.5	**28**	0.0539	5.4
8	0.4341	43.4	**30**	0.0437	4.4
10	0.3523	35.2	**32**	0.0355	3.5
12	0.2860	28.6	**34**	0.0288	2.9
14	0.2321	23.2	**36**	0.0234	2.3
16	0.1884	18.8	**38**	0.0190	1.9
18	0.1529	15.3	**40**	0.0154	1.5
20	0.1241	12.4	**42**	0.0125	1.3

Effective dose from an administered activity

Step	Detail
Formula	Effective dose (mSv) = administered activity (MBq) × dose coefficient (mSv/MBq)
Coefficients	ICRP Publication 128 tabulates dose coefficients by radiopharmaceutical for adults and children.
Worked example	370 MBq of F-18 FDG × 0.019 mSv/MBq (adult) = 7.0 mSv
Clinical use	For reference and teaching. Prescribe and verify activities with local protocols and a calibrated dose calibrator.

Sources and method

- **IAEA Live Chart of Nuclides (ENSDF evaluations, retrieved 9 November 2026)** — Half-lives of the radionuclides listed (www-nds.iaea.org/relnsd/vcharthtml/VChartHTML.html)
- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)
- **ICRP Publication 128 (2015)** — Radiation dose to patients from radiopharmaceuticals (dose coefficients)

Decay factors are calculated as 2^(−t ÷ T½) from the half-lives listed; mCi ↔ MBq uses 1 mCi = 37 MBq exactly. Interactive version, corrections and more charts: **allunitconversions.com/nuclear-medicine-decay-chart**