

B rachy-

I sotope

M anager

Filmless & All-in-One

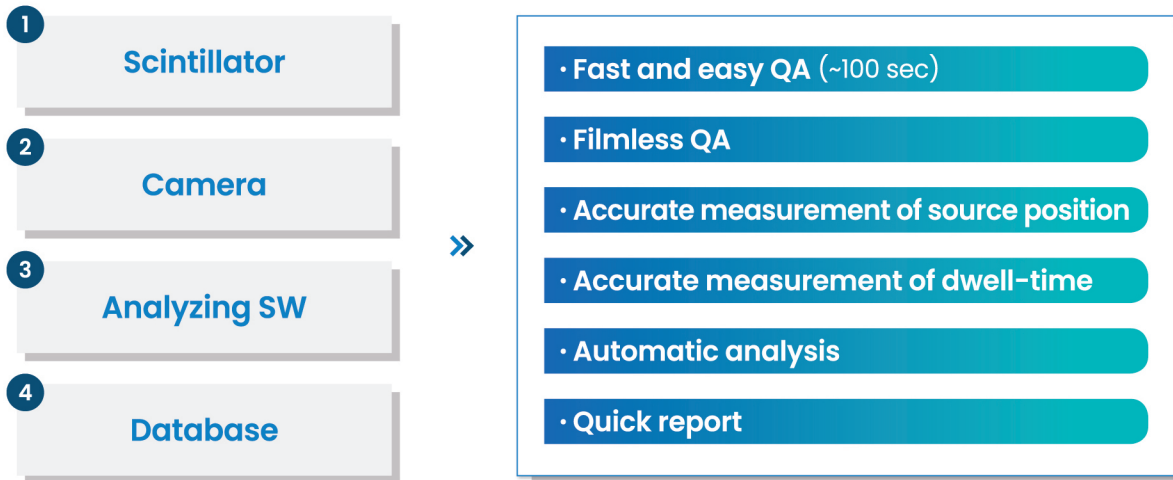
Accurate & Efficient QA for Brachytherapy



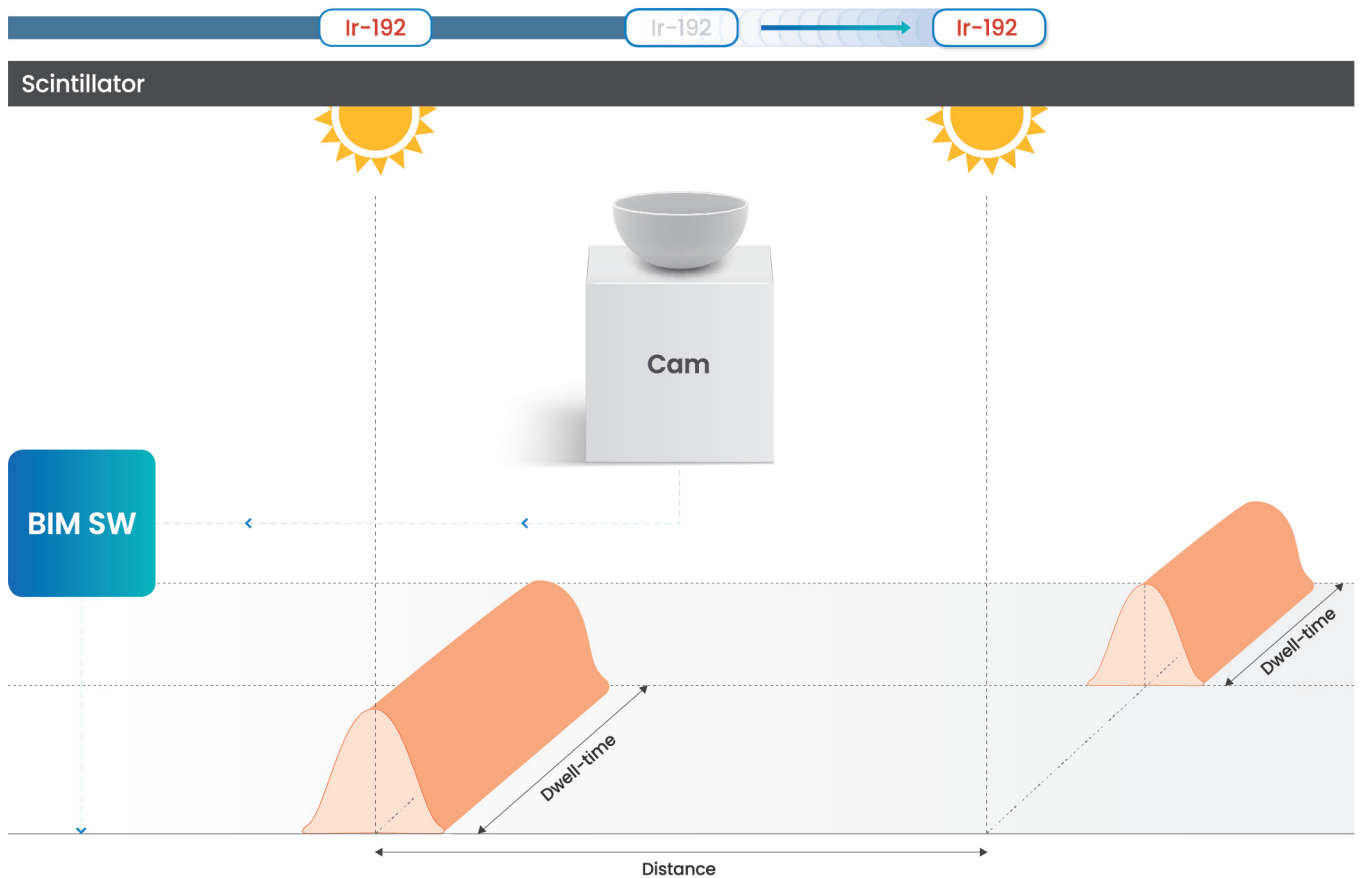
Filmless & All-in-One

Accurate & Efficient QA for Brachytherapy

Features of Brachy-Isotope Manager (BIM)



Working Principle



All-in-One & Filmless QA

QA Method \ QA Item	Absolute position	Distance interval	Dwell-time	Activity Check	Activity Measurement
Conventional	Position check ruller	Auto radiograph	Watch / Timer	Calculation sheet	Well-type IC & EM
Our Device	☑	☑	☑	☑	Well-type IC & EM

Accuracy of QA

QA Method \ QA Item	Absolute position	Distance interval	Dwell-time
Conventional	Film depend.	Film depend.	Stopwatch
Our Device	< 1 mm	< 1 mm	~ 0.1 sec

QA Solutions for Brachytherapy

Recommended in TG-40, TG-56



GUIDELINE

BIM can perform basic quality assurance (QA) checks for the positional and temporal accuracy of HDR brachytherapy sources and provide the various checklists recommended by TG-56 for periodic QA reports.

Frequency	Feature	Tolerance
Daily	• Dose delivery accuracy (verifying date, time, and source strength)	3%
	• Verifying treatment status indicator lights and critical source control functions	Functional
	• Temporal accuracy	± 1%
	• Positional accuracy	± 1 mm
	• Door interlock	Functional
	• Audio/visual system communication : CCTV, etc.	Functional
	• Audible/visual error and alarm condition indicators	Functional
Quarterly / Source exchange	• Safety equipment available (Batteries, emergency equipment, survey meter, etc)	Functional
	• Source calibration	± 3%
	• Temporal accuracy	± 1%
	• Positional accuracy	± 1 mm
	• Check the period of source replacement	Functional
	• Safety equipment available (Batteries, emergency equipment, survey meter, etc)	Functional
	• Check the radiation room monitor	Functional

QA Setting & Measurement

Manufacturer Elekta / Varian / W&Z Bebig

	1	2	3	4	5	6	7	8	9	10	11	12
L (mm)	1500		1495		1490		1485		1480	-		1400
Ch1 (s)	2		10				15					
Ch2 (s)	20				5			5			10	
Ch3 (s)		10		5	5			5	5			

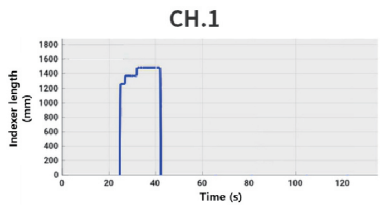
	1	2	3	4	5	6	7	8	9	10	11	12
Ch1 (s)	●		●				●					
Ch2 (s)	●				●			●			●	
Ch3 (s)		●		●	●			●	●			



Analysis of Position / Dwell-time Accuracy



yklim2023 (Medical physicist)

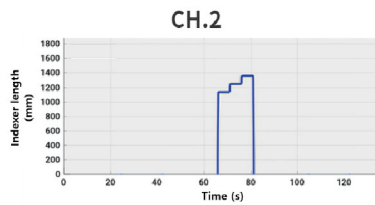


Position accuracy

Point	Setting distance (mm)	Measured distance (mm)	Difference (mm)	Pass/Fail
P1	1500	1499.5	+0.5	Pass
P2	1490	1490.1	+0.1	Pass
P3	1480	1480.5	+0.5	Pass

Temporal accuracy

Point	Setting dwell time (s)	Measured dwell time (s)	Difference (s)	Pass/Fail
P1	10	9.9	0.1	Pass
P2	5	5.1	-0.1	Pass
P3	2	1.9	0.1	Pass

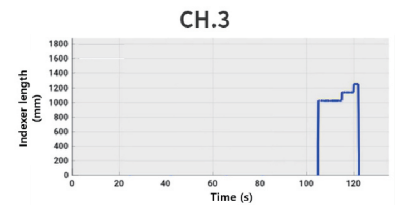


Position accuracy

Point	Setting distance (mm)	Measured distance (mm)	Difference (mm)	Pass/Fail
P1	1490	1490.5	+0.5	Pass
P2	1480	1479.9	-0.1	Pass
P3	1470	1470.2	+0.2	Pass

Temporal accuracy

Point	Setting dwell time (s)	Measured dwell time (s)	Difference (s)	Pass/Fail
P1	5	5.0	0.0	Pass
P2	5	5.1	+0.1	Pass
P3	5	5.0	-0.1	Pass



Position accuracy

Point	Setting distance (mm)	Measured distance (mm)	Difference (mm)	Pass/Fail
P1	1480	1479.7	-0.3	Pass
P2	1470	1470.1	0.1	Pass
P3	1460	1459.8	-0.2	Pass

Temporal accuracy

Point	Setting dwell time (s)	Measured dwell time (s)	Difference (s)	Pass/Fail
P1	2	1.9	-0.1	Pass
P2	5	5.1	0.1	Pass
P3	10	10.1	0.1	Pass

Patents

- > 근접 방사선원의 방사선량분포 측정장치 및 그 측정방법 (2019) **Korea**
- > Apparatus for brachytherapy radiotherapy dosimetry and method of the same (2021) **USA, Europe (Pending)**