



Patient QA efficiency and accuracy
through high-resolution measurements, automation and prediction

myQA[®] iON

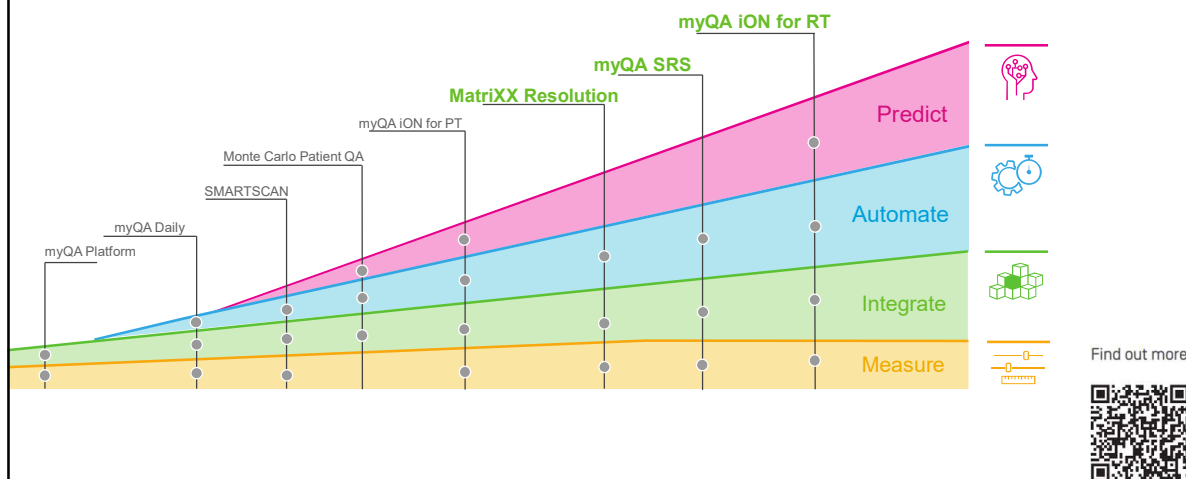
© 2021 IBA Dosimetry

DOSIMETRY



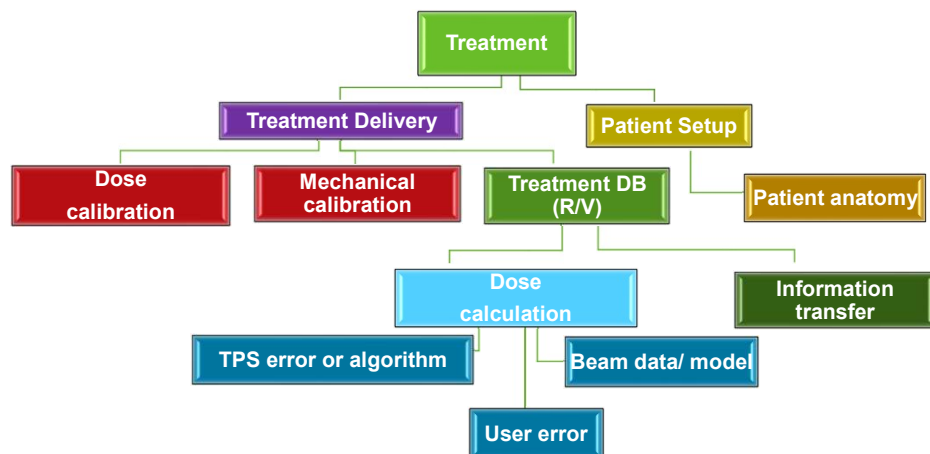
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Innovation and Evolution of Quality Assurance



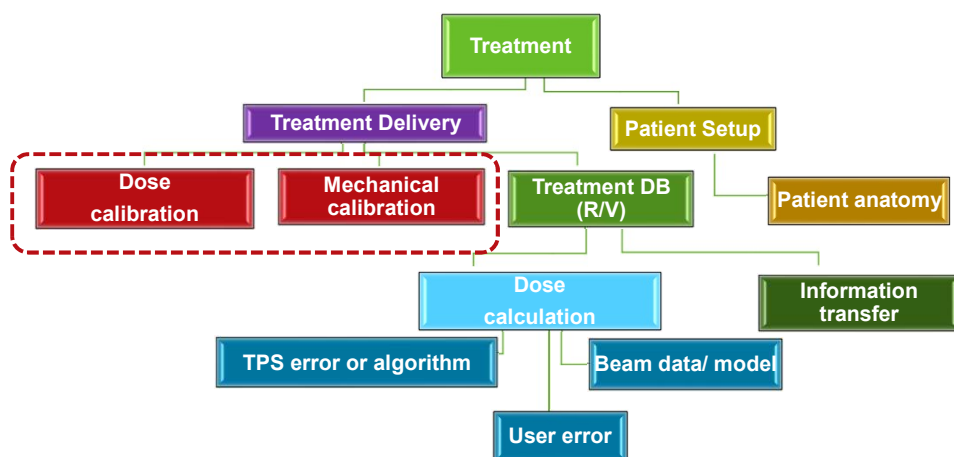
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Errors and Plan QA



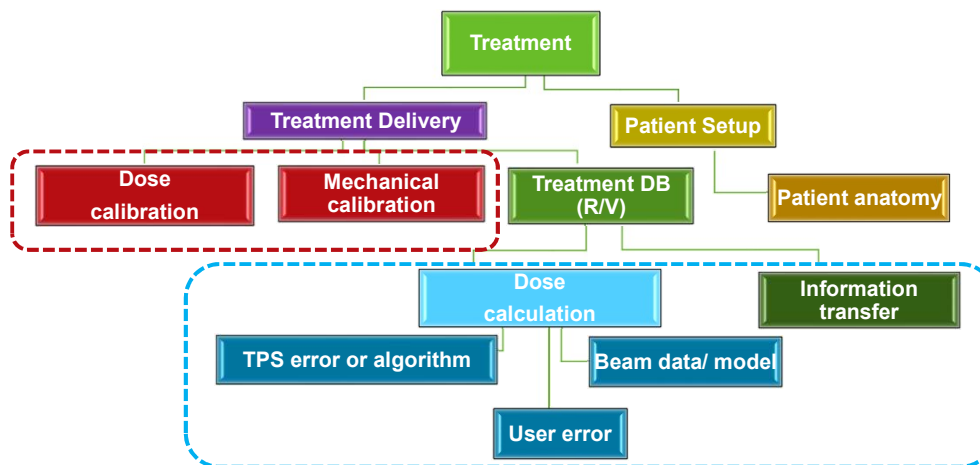
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Errors and Plan QA



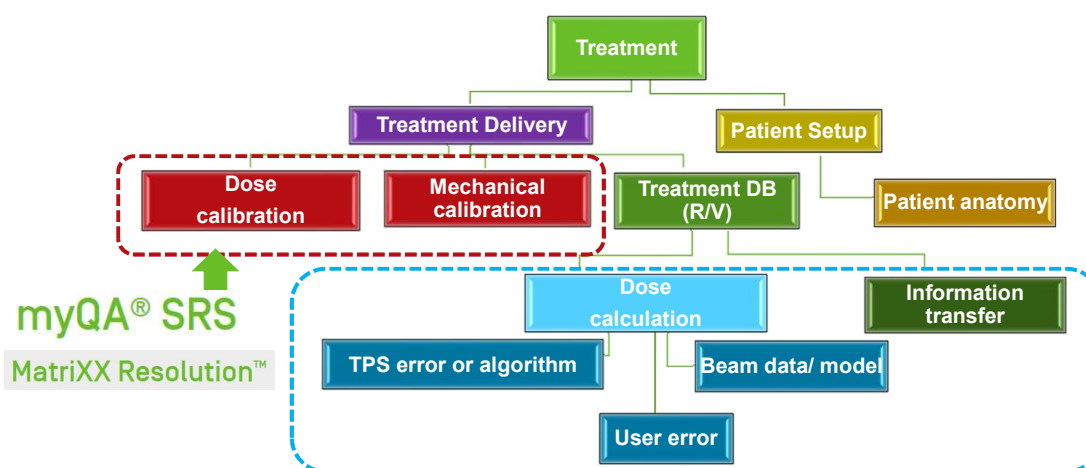
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Errors and Plan QA



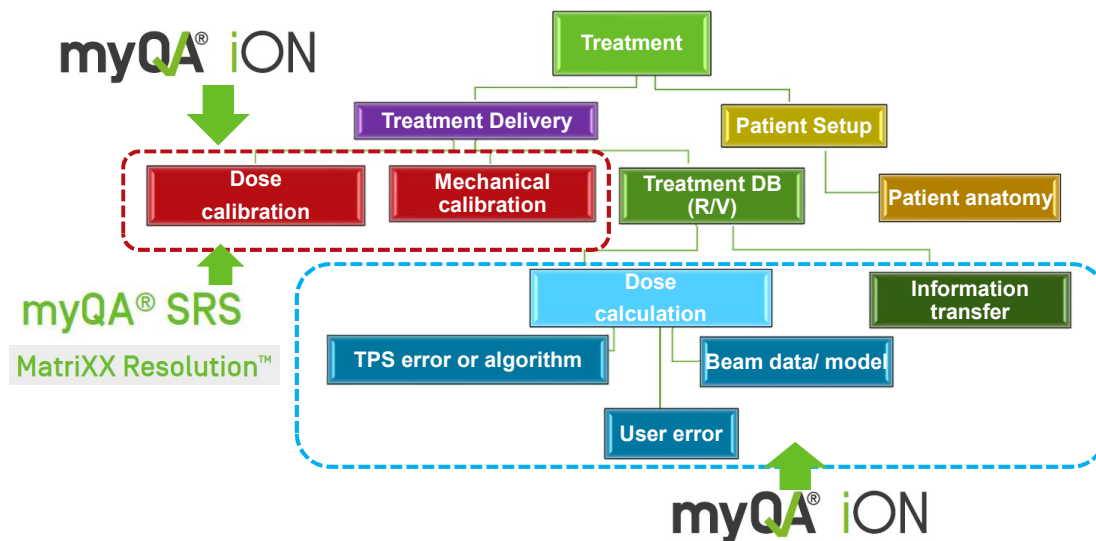
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Errors and Plan QA



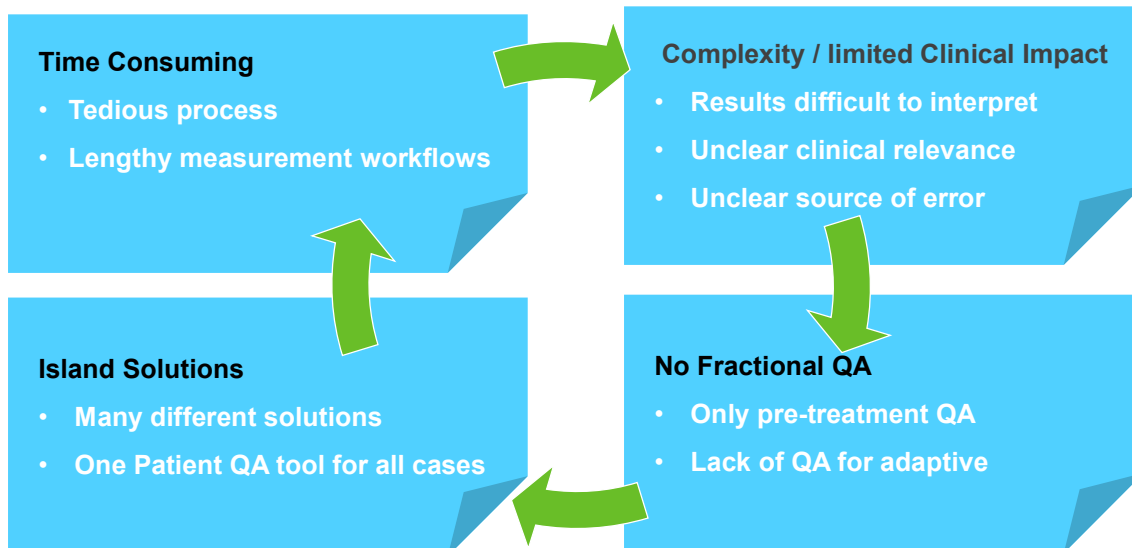
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Errors and Plan QA



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Challenges with today's Patient QA



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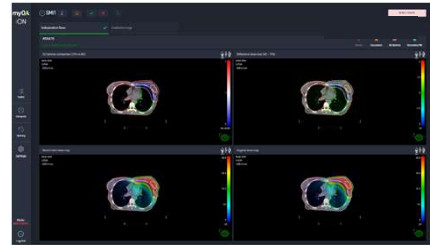
RT Patient QA Quality Management

Accuracy

- Better patient QA decisions, focus on clinical relevance.
- Monte Carlo: best in class accuracy Monte Carlo.
- Log: QA from pre-treatment until the last fraction.

Efficiency

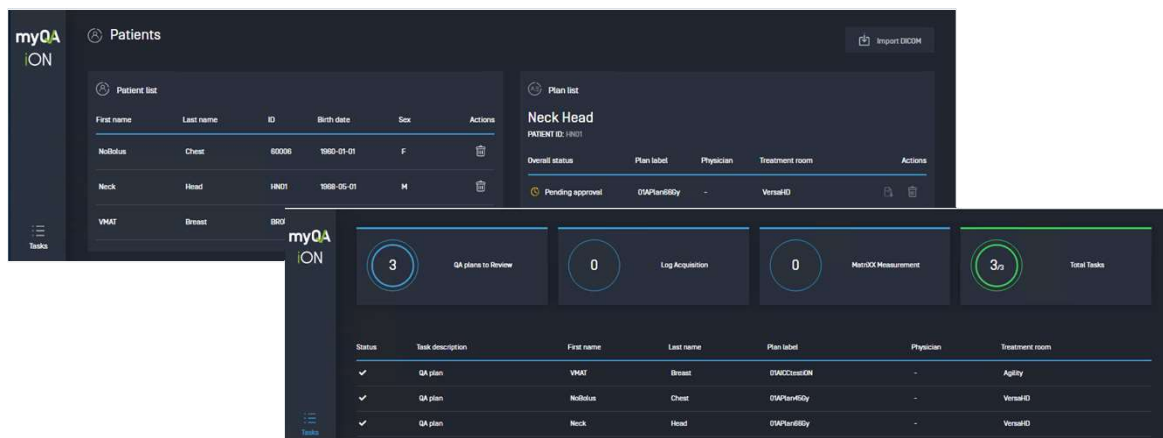
- Simplifies and accelerates patient QA processes
- Frees physics times and linac resources.
- Enhances department efficiency and treatment safety.



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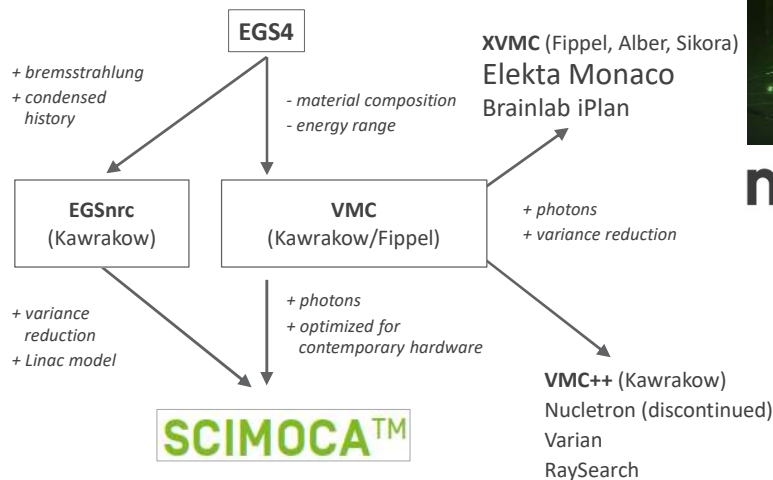
Workflow efficiency

- **Task-based QA:**
 - keep overview
 - optimal QA workflow management

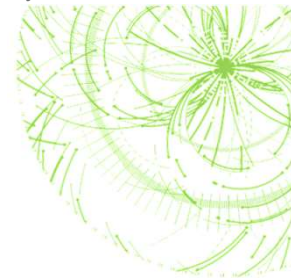


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Monte Carlo dose calculation and plan QA



myQA[®] iON
powered by SciMoCa™ Monte Carlo



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Secondary dose and MU verification



- Both MU and dose check
- Beam review

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Neck Head

Independent Dose

RESULTS

SECONDARY MU

	1	2	3	4	5	6	7	8	9	10	11
Beam name	NA04	NA08	NA12	NA13	NA14	NA15	NA16	NA17	NA18	NA19	NA20
Energy (MV)	6	6	6	6	6	6	6	6	6	6	6
Beam type	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT

GEOMETRY

DOSE CHECK

	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245	10.B.-250.S.-245
Beam dose specification point (g/cm ³)	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
TPS beam dose (Gy)	0.04	0.06	0.12	0.27	0.55	0.28	0.28	0.35	0.34	0.05	0.23
SciMoCa beam dose (Gy)	0.04	0.05	0.12	0.26	0.54	0.27	0.28	0.35	0.34	0.05	0.23
Beam dose percentage difference (%)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TPS MU	85.98	88.03	58.34	57.09	85.43	84.94	82.59	58.51	58.55	72.25	72.72
SciMoCa MU	86.85	90.79	57.12	58.21	87.19	86.80	84.39	57.82	60.31	73.08	75.76
MU Difference	1.87	1.24	0.88	1.11	1.67	1.88	1.81	1.30	1.30	1.41	1.44

COMPLEXITY SCORES

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Secondary dose and MU verification



- Both MU and dose check
- Beam review

TPS beam dose [Gy]	0.04
SciMoCa beam dose [Gy]	0.04
Beam dose percentage difference (%)	1.96
TPS MU	85.18
SciMoCa MU	86.85
MU Difference	1.67

myQA iON

Neck Head

Independent Data

RESULTS

Test 5 PASS with 95.9% N

Secondary MU

	1	2	3	4	5	6	7	8	9	10	11
Beam name	1A01A	1A01B	1A02	1A03	1A04	1A05	1A06	1A07	1A08	1A09A	1A09B
Energy [MeV]	6	6	6	6	6	6	6	6	6	6	6
Beam type	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT	DynamicIMRT

GEOMETRY

DOSIMETRY

Beam dose specification point (X, Y, Z)

	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245	10.8, -258.5, -245
Density at specification point [g/cm ³]	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
TPS beam dose [Gy]	0.04	0.16	0.12	0.27	0.15	0.28	0.28	0.15	0.24	0.05	0.23
SciMoCa beam dose [Gy]	0.04	0.16	0.12	0.28	0.14	0.27	0.28	0.15	0.24	0.05	0.23
Beam dose percentage difference (%)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TPS MU	85.18	88.03	68.94	57.09	85.43	84.94	82.58	68.51	58.95	22.25	72.72
SciMoCa MU	86.85	90.78	57.12	58.21	87.93	86.80	84.39	57.62	60.31	23.88	75.16
MU Difference	1.67	1.24	0.98	1.11	1.67	1.86	1.81	1.10	1.36	1.41	1.44

COMPLEXITY SCORE

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Plan complexity scores



- How challenging is to deliver the perfect plan?
- Complexity scores correlate with gamma pass rates and MLC performance

(JM Park et al, Y Wang et al, C McGarry et al)

- Easily identify challenging beams
 - For your linac
 - For your measurement-based QA
 - For your TPS dose calculation

COMPLEXITY SCORE

	5.22	7.12	7.92	8.87	9.25	11.30	11.69	8.18	4.54	4.38
Field irregularity	5.22	7.12	7.92	8.87	9.25	11.30	11.69	8.18	4.54	4.38
Leaf travel variability	0.27	0.29	0.33	0.27	0.42	0.47	0.79	0.69	0.15	0.17
Off axis contribution	598.57	968.96	3981.86	9153.89	6042.12	4830.30	3206.18	1610.09	1878.74	3064.12
Max leaf travel per monitor units	22.92	24.26	27.68	27.68	27.68	27.67	27.69	27.67	20.59	23.34
Max gantry rotation per monitor units	0	0	0	0	0	0	0	0	0	0
Beam delivered energy [MU*cm ²]	5290.12	4904.73	6201.61	6283.37	5404.58	5145.59	4362.26	2494.87	7703.61	8288.34

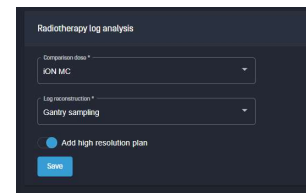
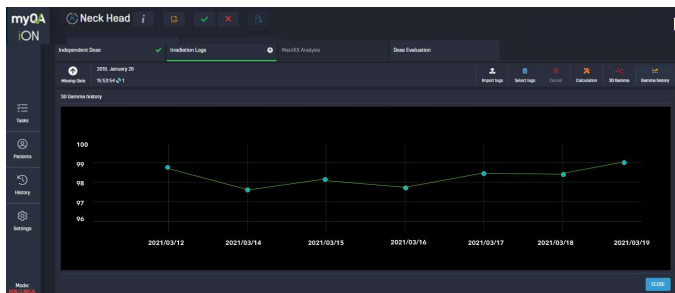
CLOSE

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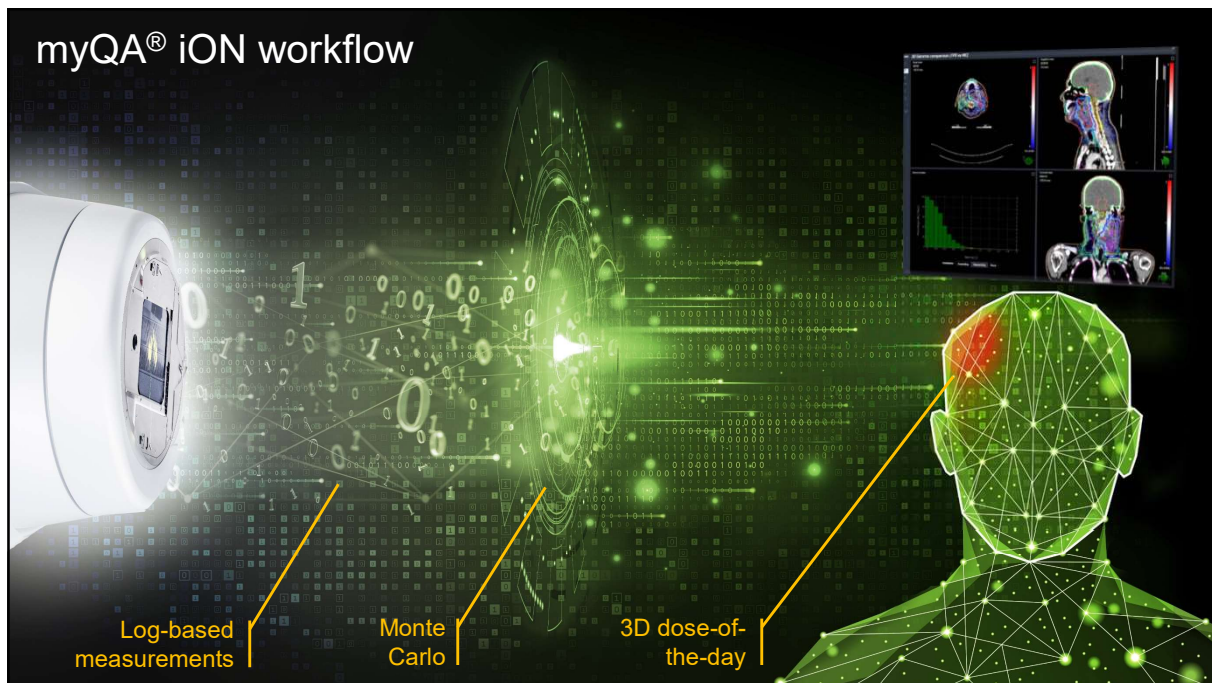
Measure your plan every day



- Linac logfile data before and during each treatment fraction
- Highest resolution measurements for jaws, MLC and gantry in real time
- Pinpoints the exact origin of errors
- Same Monte Carlo algorithm to exclude bias in comparison
- Multiple RT plan reconstruction options



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Plan Analysis - myQA[®] iON

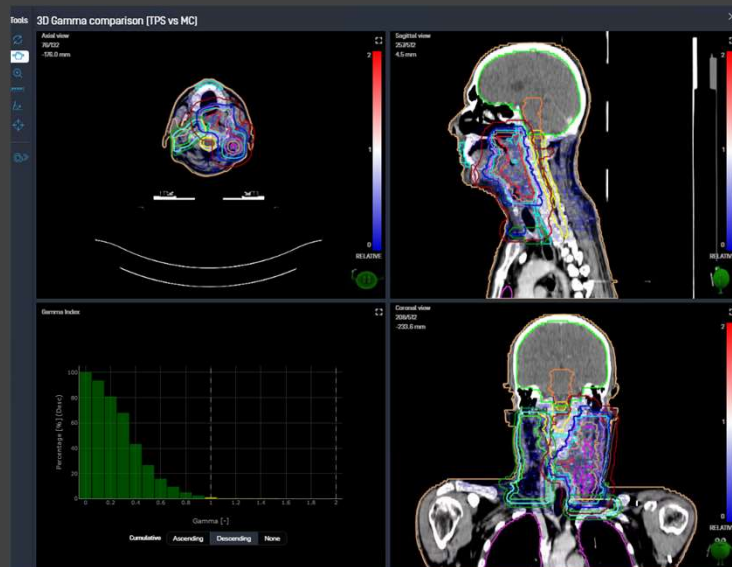
- ✓ 3D dose and 3D gamma
- ✓ In patient anatomy
- ✓ Clinical relevance
- ✓ Enables reviews with MD



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Plan Analysis - myQA[®] iON

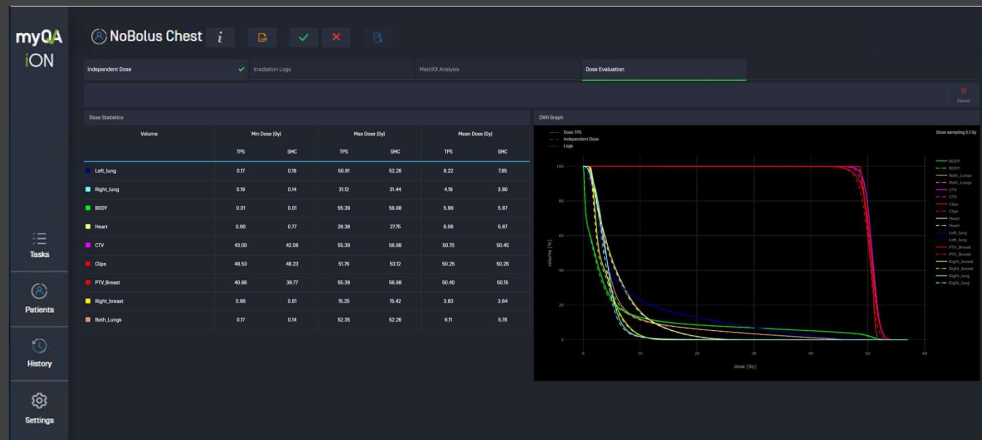
- ✓ 3D dose and 3D gamma
- ✓ In patient anatomy
- ✓ Clinical relevance
- ✓ Enables reviews with MD



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DVH - myQA[®] iON

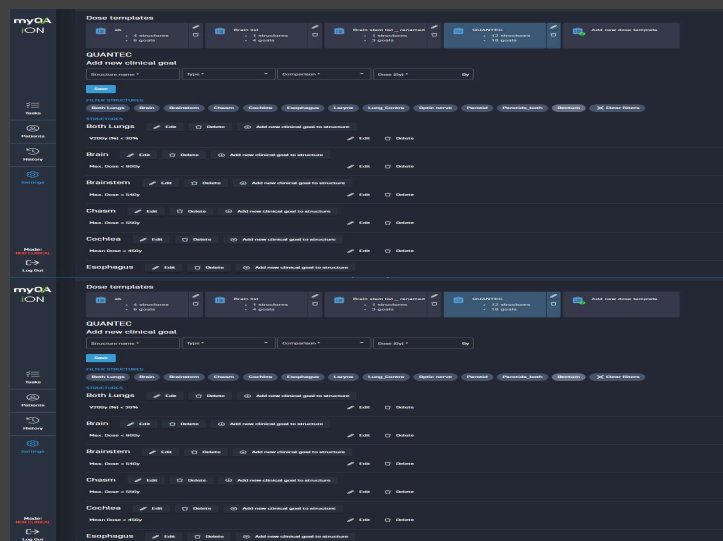
- Evaluate QA plans like your TPS does
- Comparison vs Monte Carlo dose check or log-based plan



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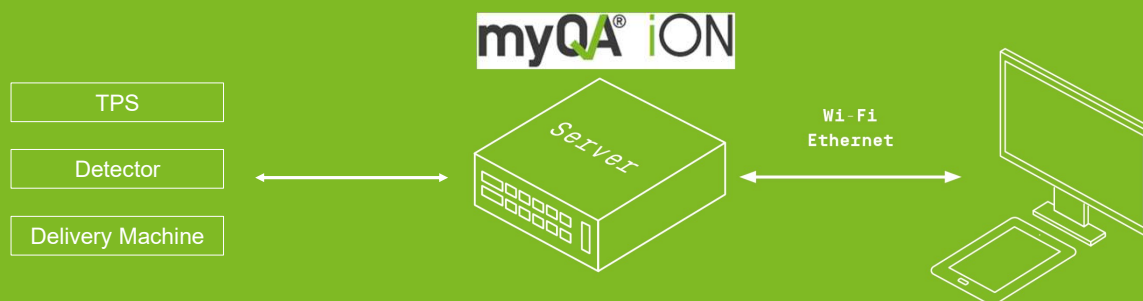
Clinical goals - myQA[®] iON

- Verify plan acceptance criteria independently
- Easily configurable dose templates
 - QUANTEC
 - AAPM SRS/SBRT
 - Institution-specific



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Network Access – Patient QA anytime and anywhere

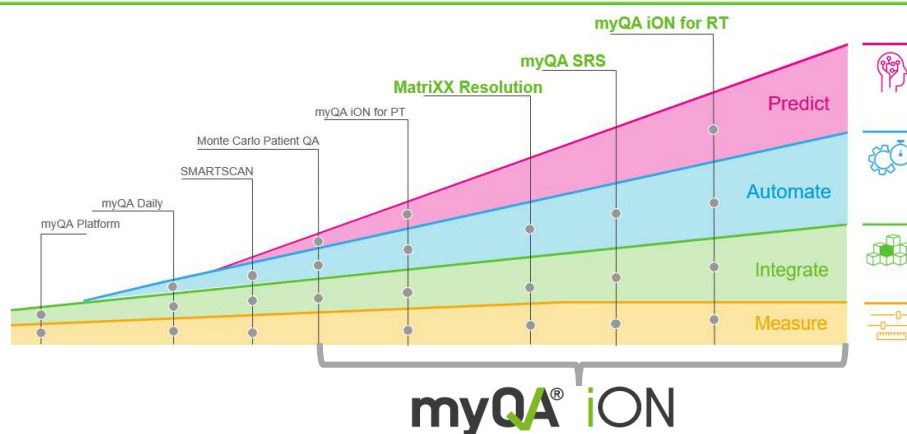


- Web-client software
- Easy and fast integration into existing IT infrastructure
- Execute tests and review your results on any network device

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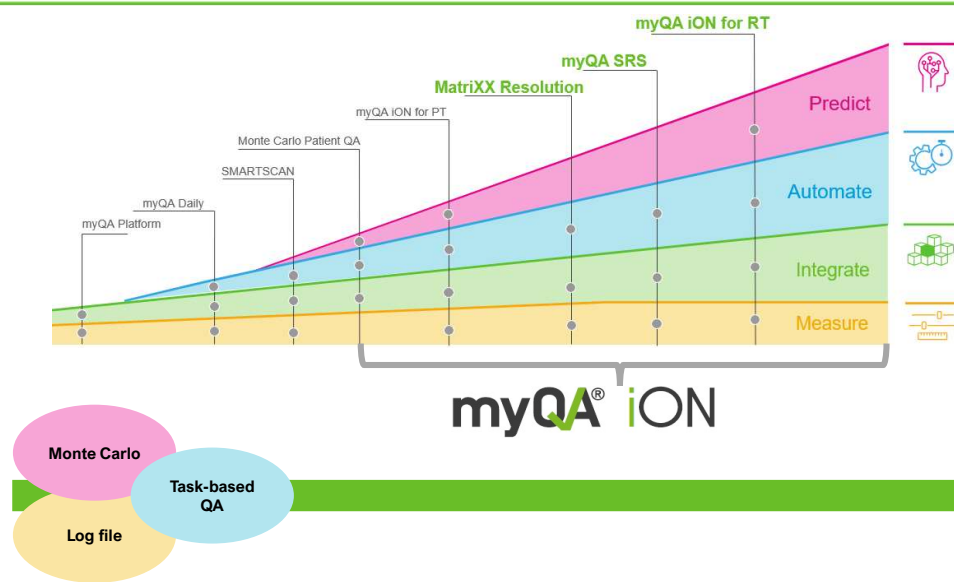
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Introducing myQA iON



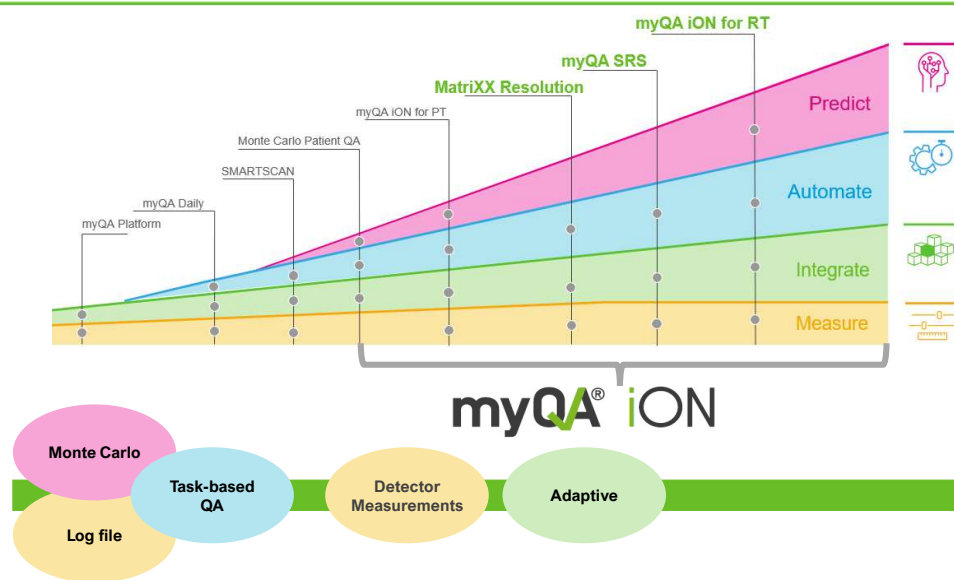
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Introducing myQA iON



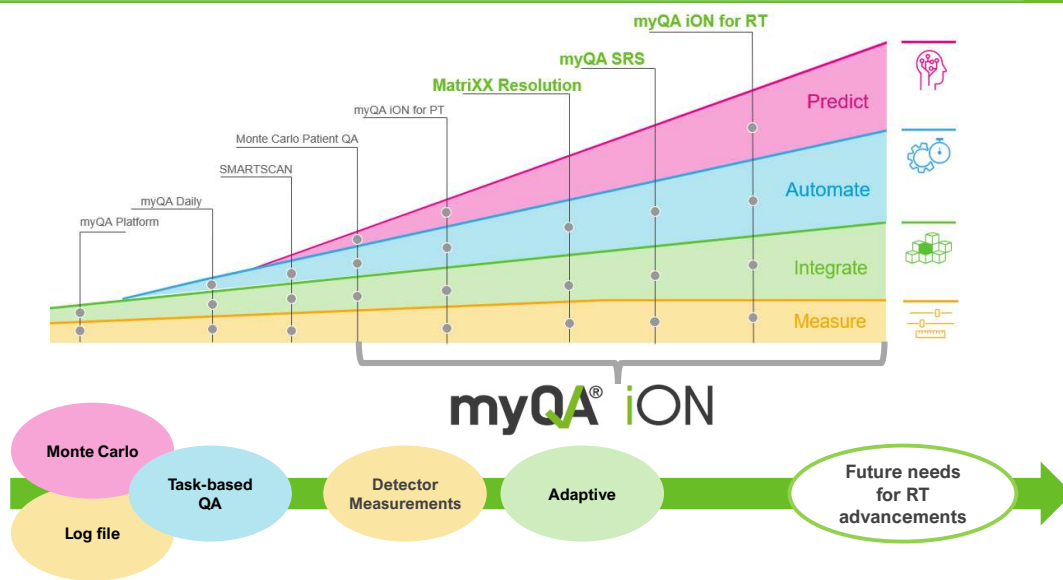
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Introducing myQA iON



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Introducing myQA iON



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myQA[®] SRS - digital SRS/SBRT Patient QA solution



■ The Power of SRS revealed!

- ✓ 0.4 mm film-class resolution
- ✓ 12 x 14 cm²
- ✓ 105,000 measurement points
- ✓ TG-218 compatible
- ✓ Zero pixel spacing



"Patient-specific SRS and SBRT QA results look great using the myQA SRS even for very tight parameters of 2mm/2%. The digital detector QA workflow with myQA SRS is 10⁶ times faster and easier compared to using film. The film-equivalent resolution for our QA measurements is the basis for better and more meaningful SRS patient plan verification with a high sensitivity and specificity to detect real dosimetric issues."

Yun Yang PhD, DABR
Department of Radiation Oncology, Rhode Island Hospital, USA

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MatriXX Resolution



■ Highest Resolution for IMRT & VMAT



- ✓ 6.5 mm resolution
- ✓ 1521 small-volume ionization chambers
- ✓ 25.3 x 25.3 cm²
- ✓ Completely wireless
- ✓ TG-218 compatible
- ✓ Central line chambers



... the detector has a **great spatial resolution** combined with the **excellent dosimetric response** of the IBA ionization chambers, which ensure precision and reproducibility at all dose, dose rate and x-ray energy conditions of clinical use...
... the system allows **quick and reliable pretreatment checks of IMRT and VMAT plans**, with fields from small to very large size....

Luca Bindoni, Medical Physicist, Treviso Regional Hospital, Italy

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myQA® New Software features

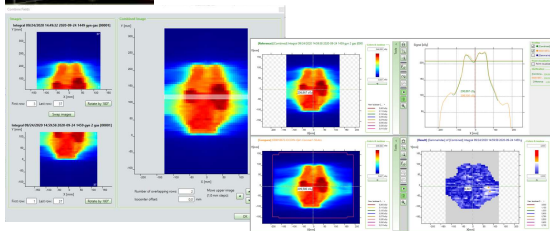


Combine fields

- Large fields QA
- Essential for Halcyon™ users
- Single combined measurement

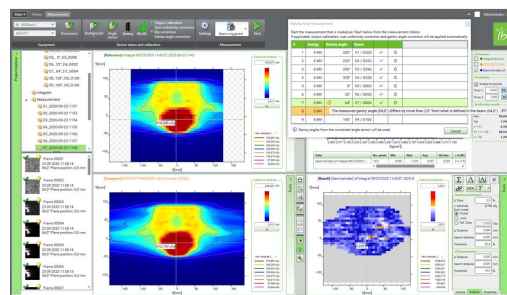


> MatriXX Resolution detector length



Field by field

- For IMRT commissioning AAPM TG-218
- Automated measurement process for 0 and native gantry angles



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Thank you.

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For more information, please contact your
Patient QA Experts at IBA Dosimetry

iba-dosimetry.com

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