



Shareable Clinical Pathways in Radiation Oncology Using BPMN and DMN

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<https://www.varian.com/oncology/products/treatment-delivery/truebeam-radiotherapy-system>



<https://www.elekta.com/radiotherapy/treatment-delivery-systems/versa-hd/>

**Cancer Diagnosis
Radiation Therapy Indicated
Radiation Course**

1..N CT/PET/MRI Simulations

1..M Treatment Plans Created

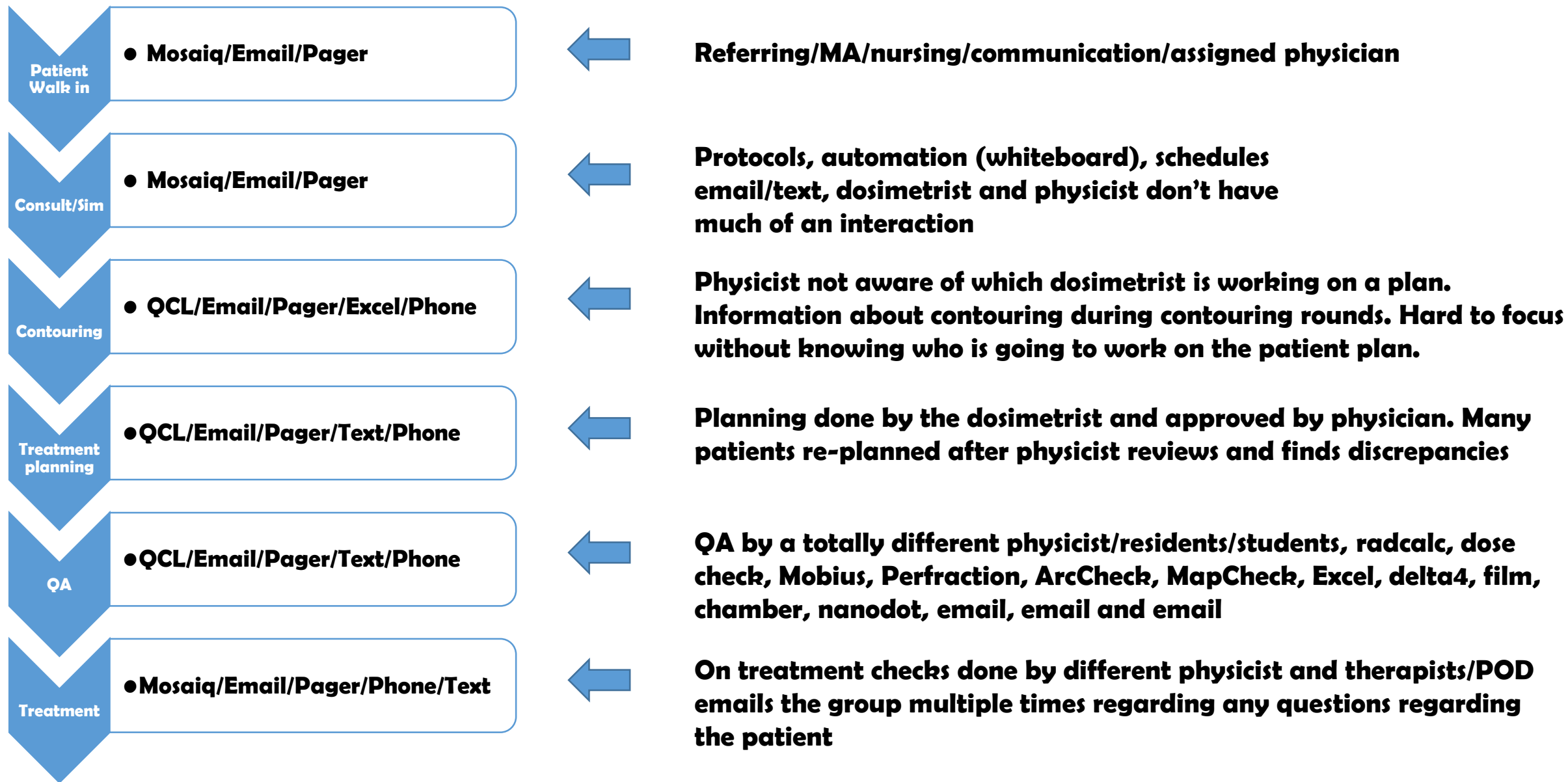
Plan Check/Verification

1..Y Radiation Treatments

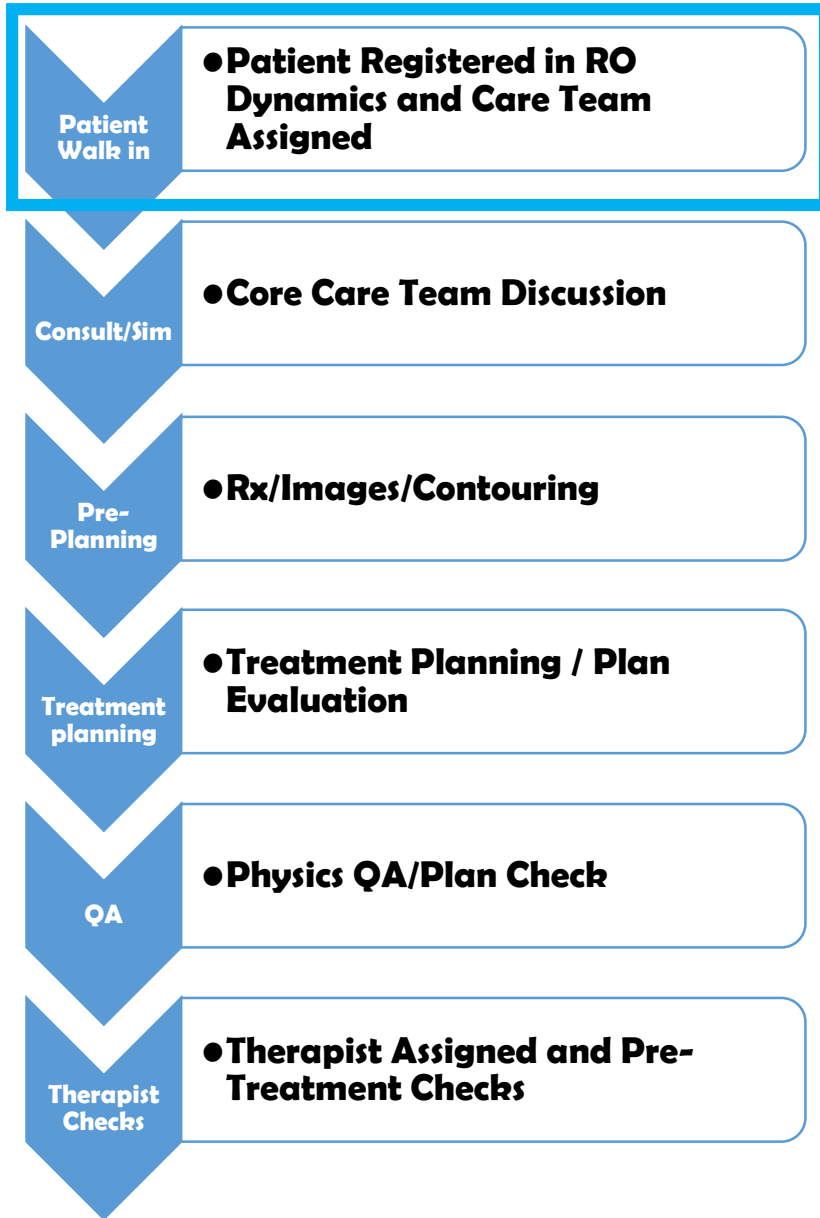
**Care Team: Radiation Oncologists, Nurses,
Medical Physicists, Medical Dosimetrists,
Radiation Therapists, Managers, IT**

Highly Complex, Technical Treatment with Diverse Care T

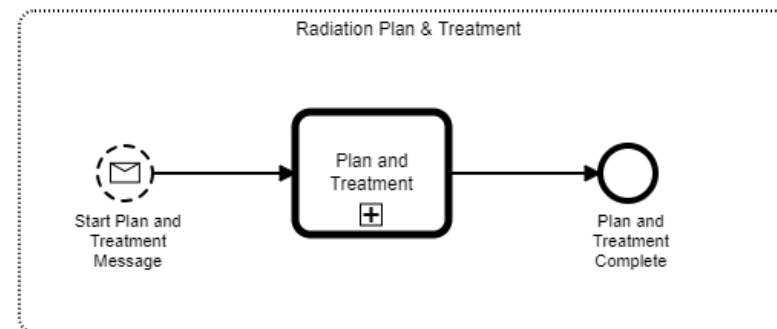
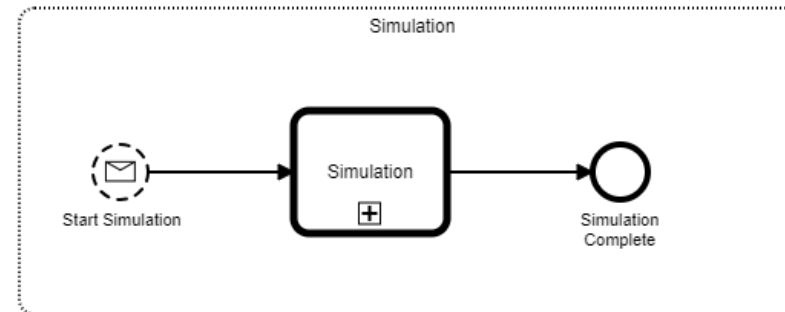
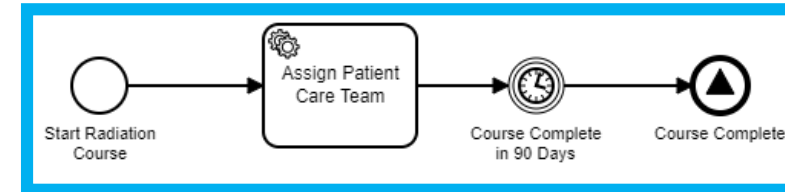
OHSU Current Workflow in Clinic



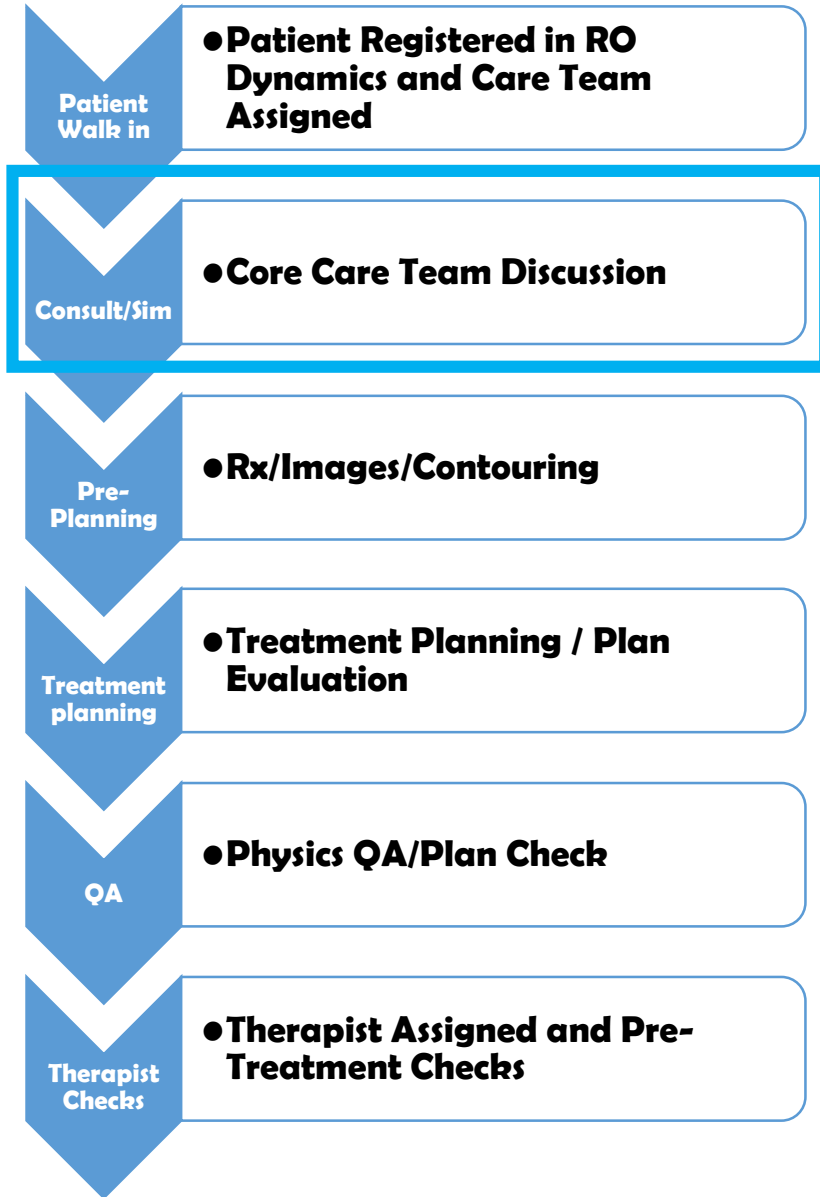
OHSU Proposed Workflow



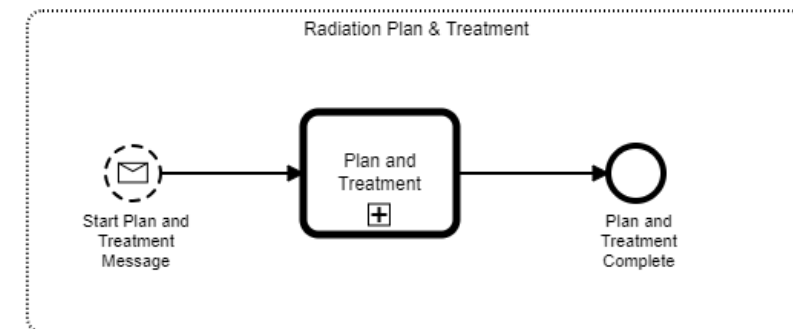
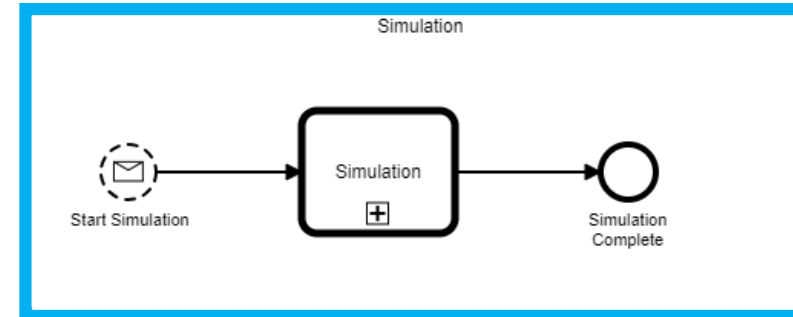
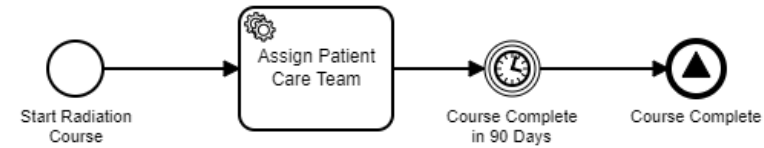
BPMN Workflows



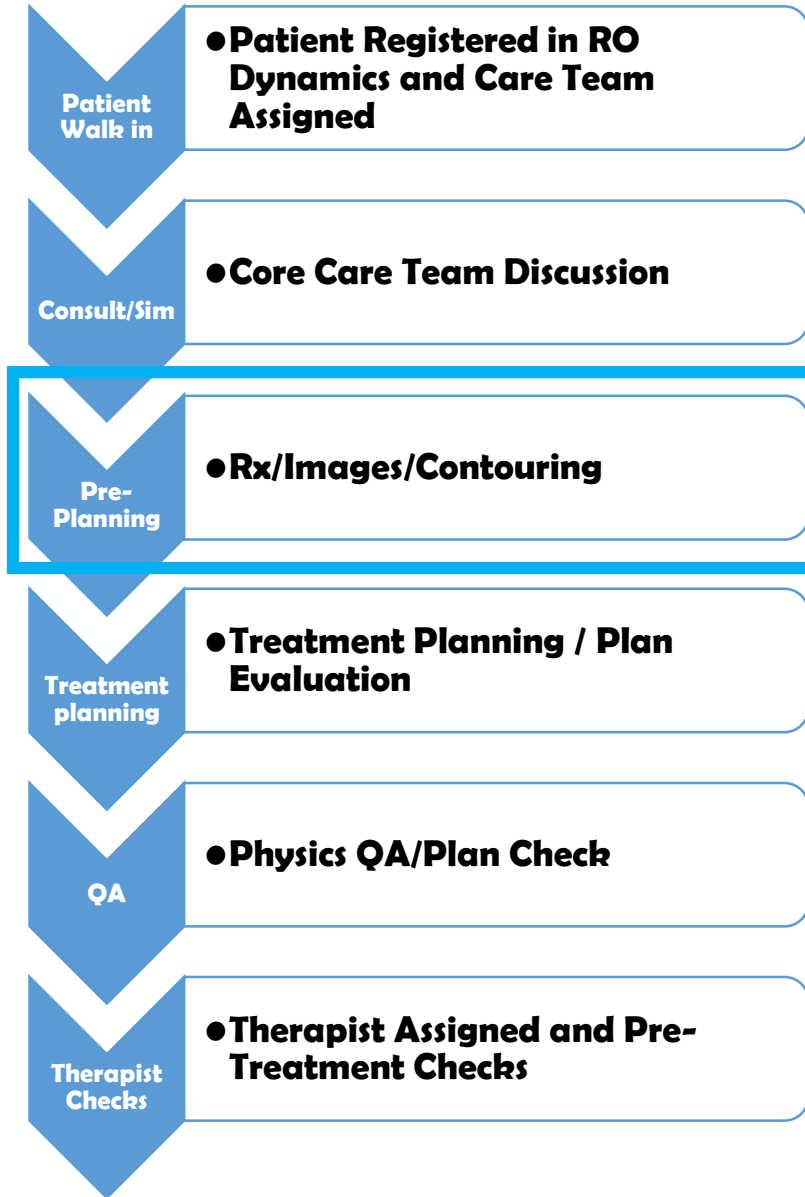
OHSU Proposed Workflow



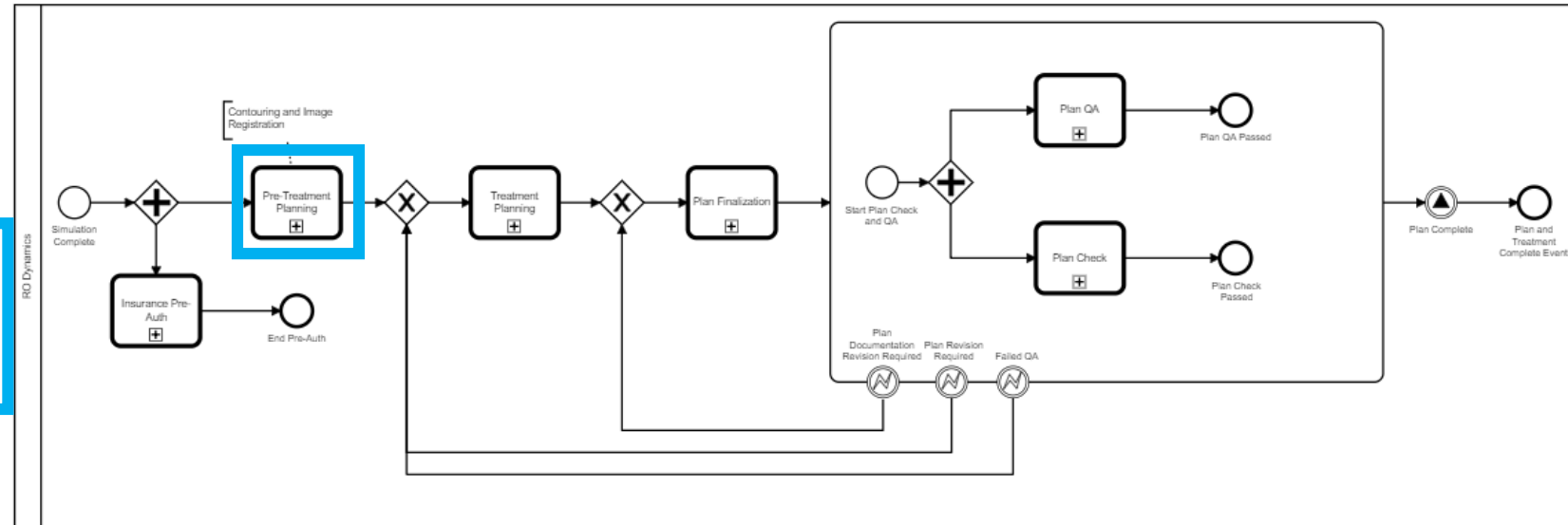
BPMN Workflows



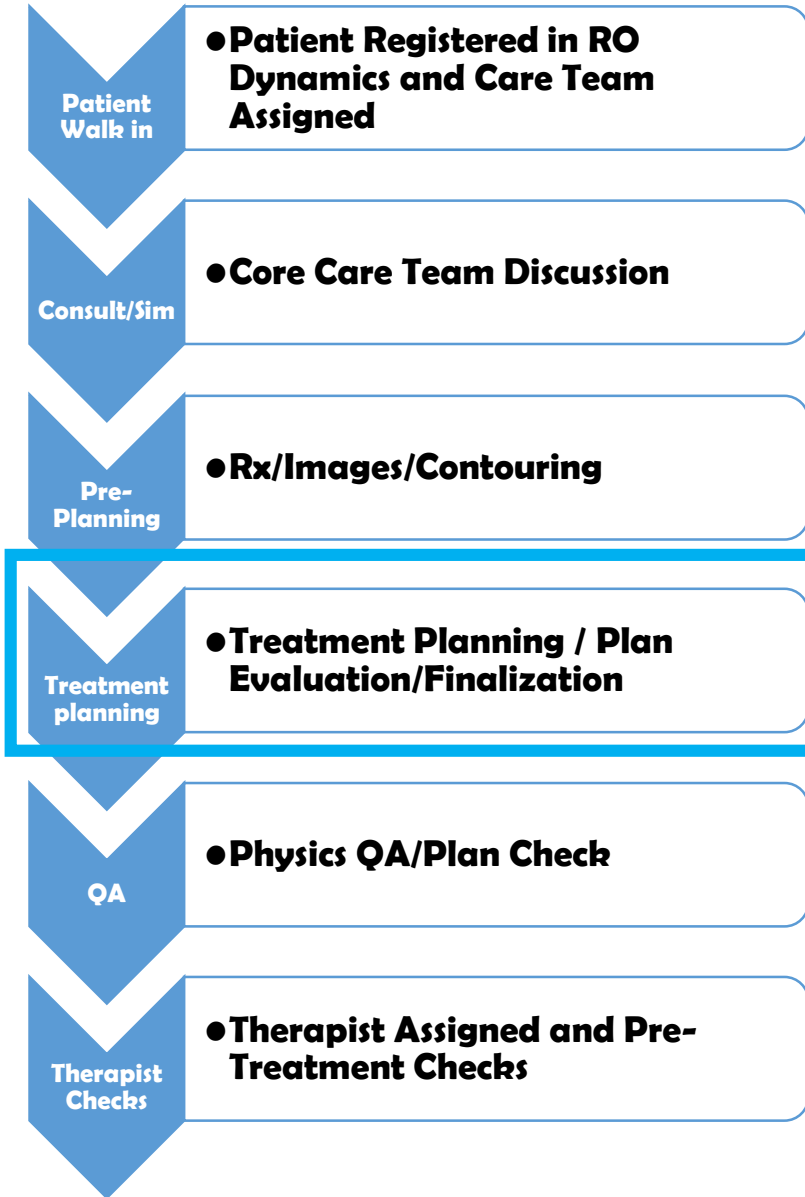
OHSU Proposed Workflow



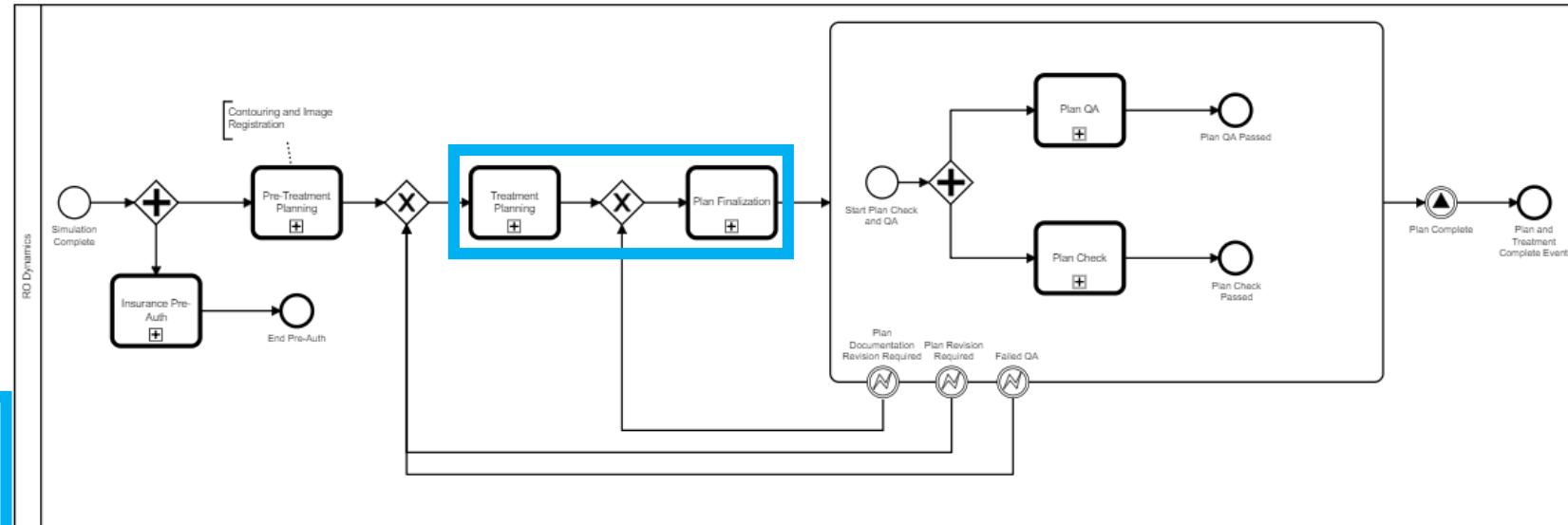
BPMN Workflows



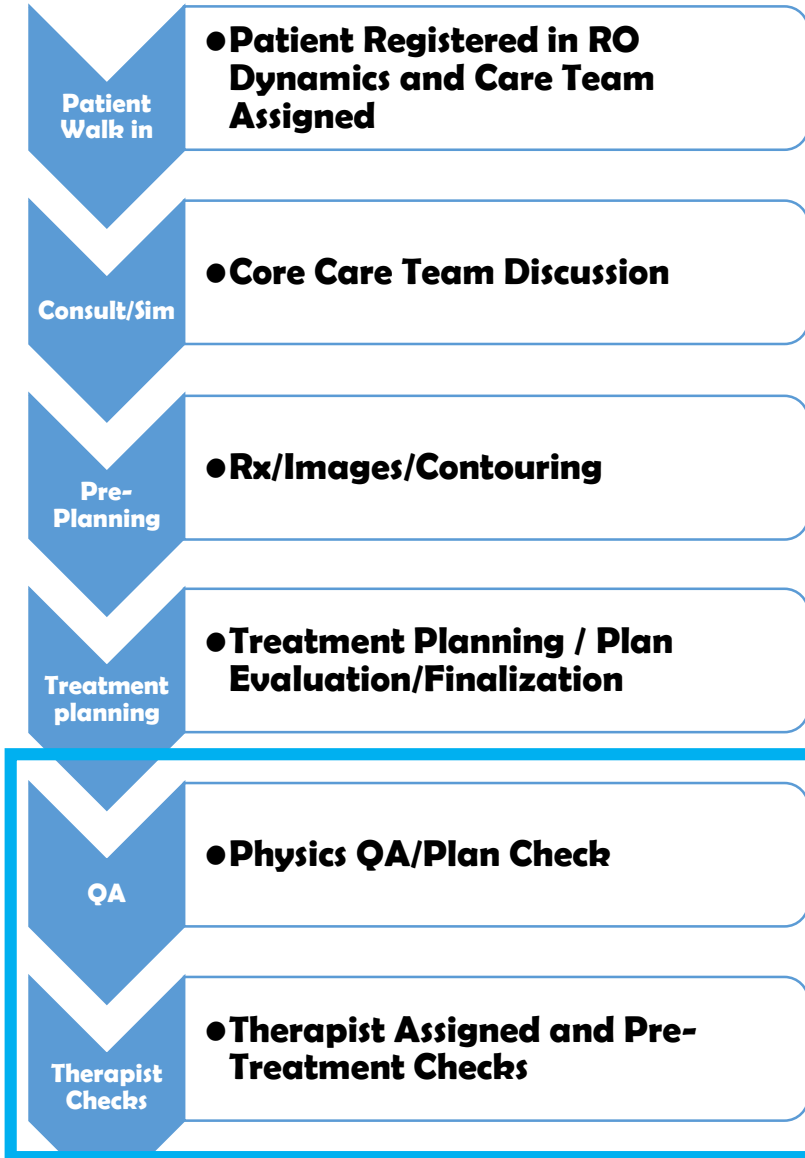
OHSU Proposed Workflow



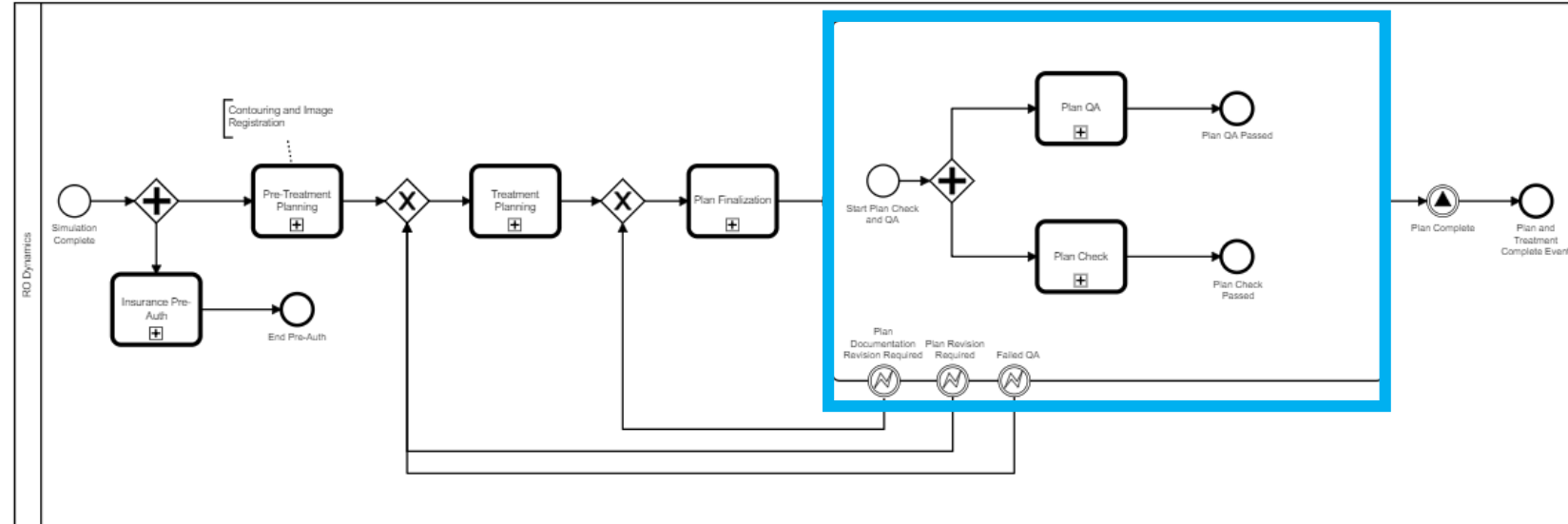
BPMN Workflows



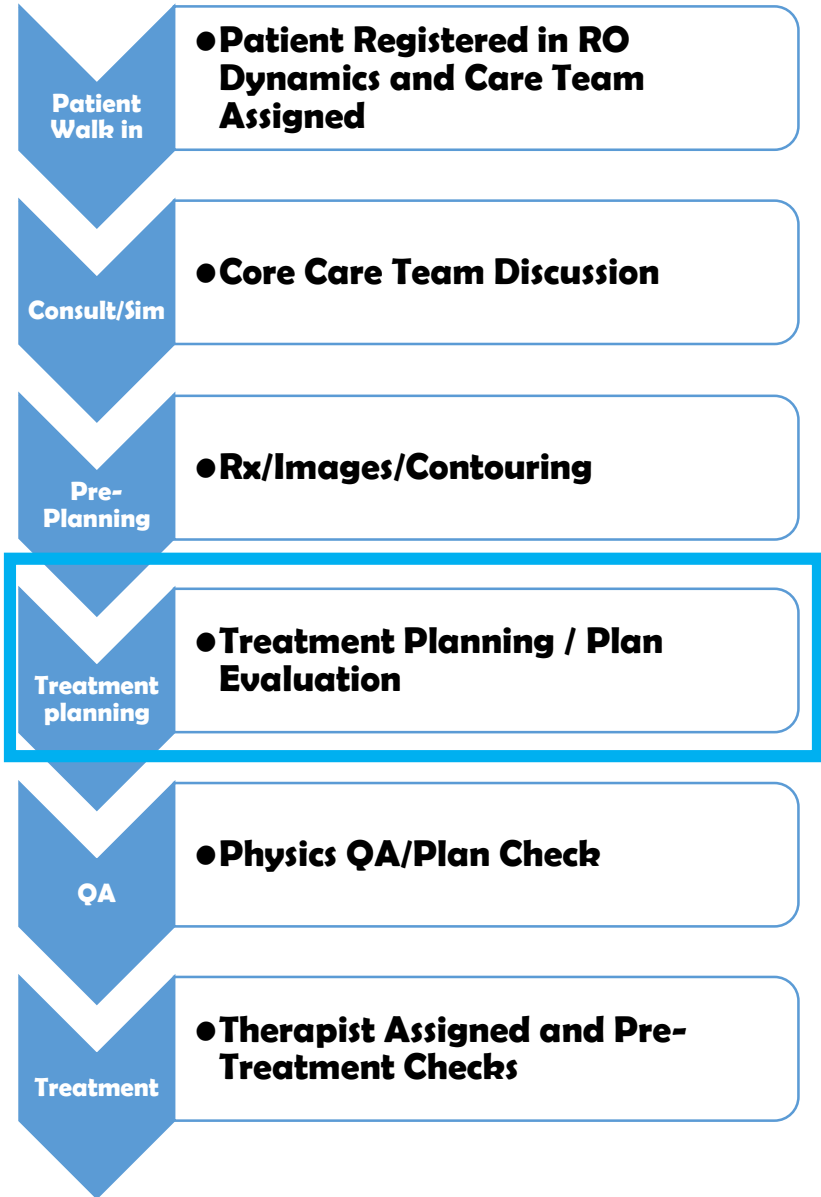
OHSU Proposed Workflow



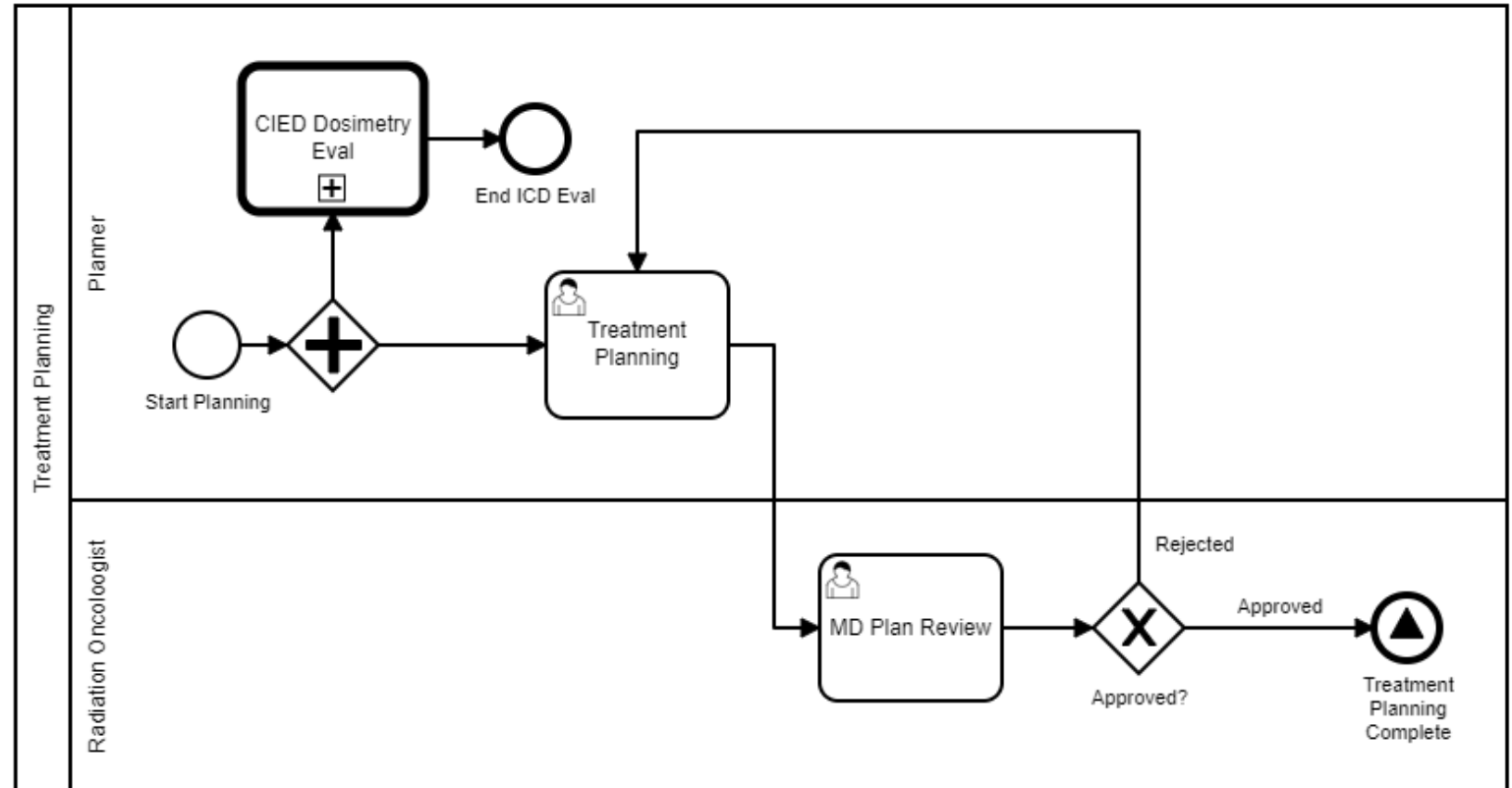
BPMN Workflows



OHSU Proposed Workflow



Treatment Planning Call Activity Example



Cardiac Implantable Electronic Device

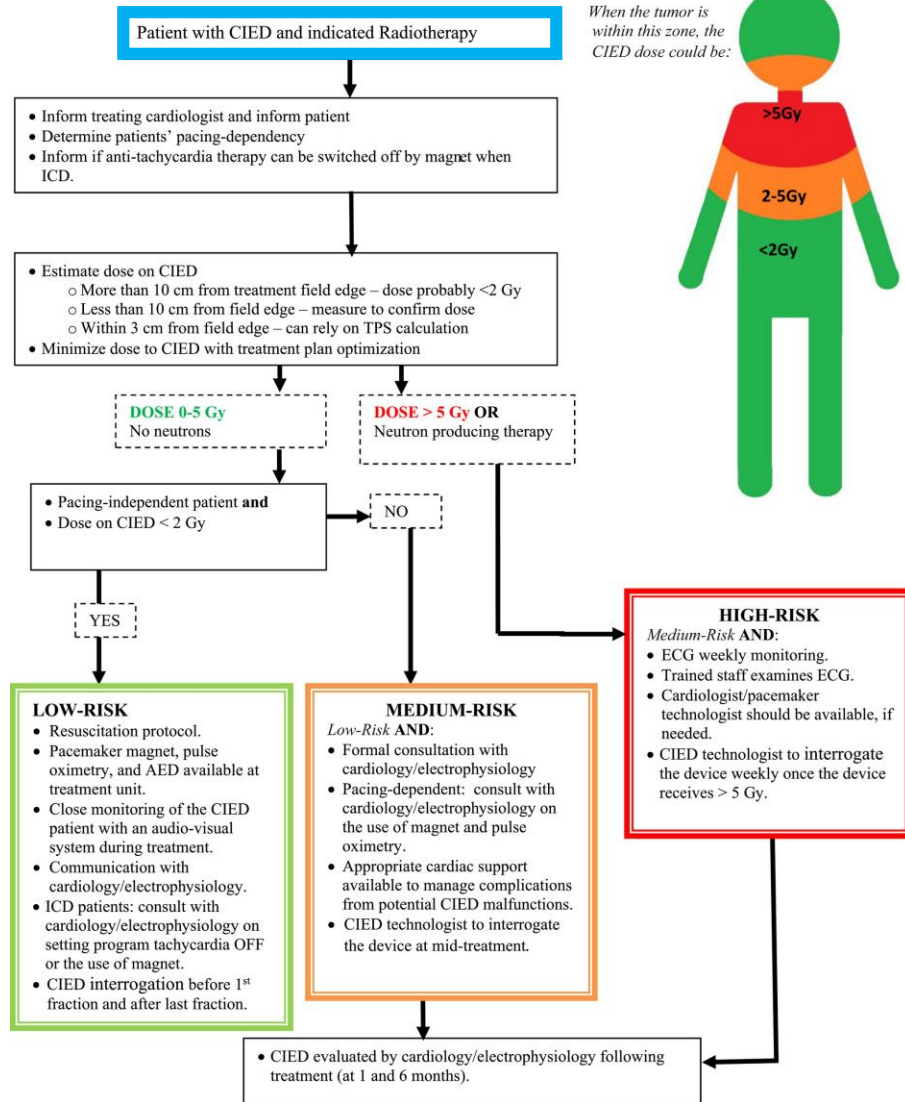
AAPM TG-203 Report: Management of radiotherapy patients with implanted cardiac pacemakers and defibrillators

“Managing radiotherapy patients with implanted cardiac devices (implantable cardiac pacemakers and implantable cardioverter-defibrillators) has been a great practical and procedural challenge in radiation oncology practice.”

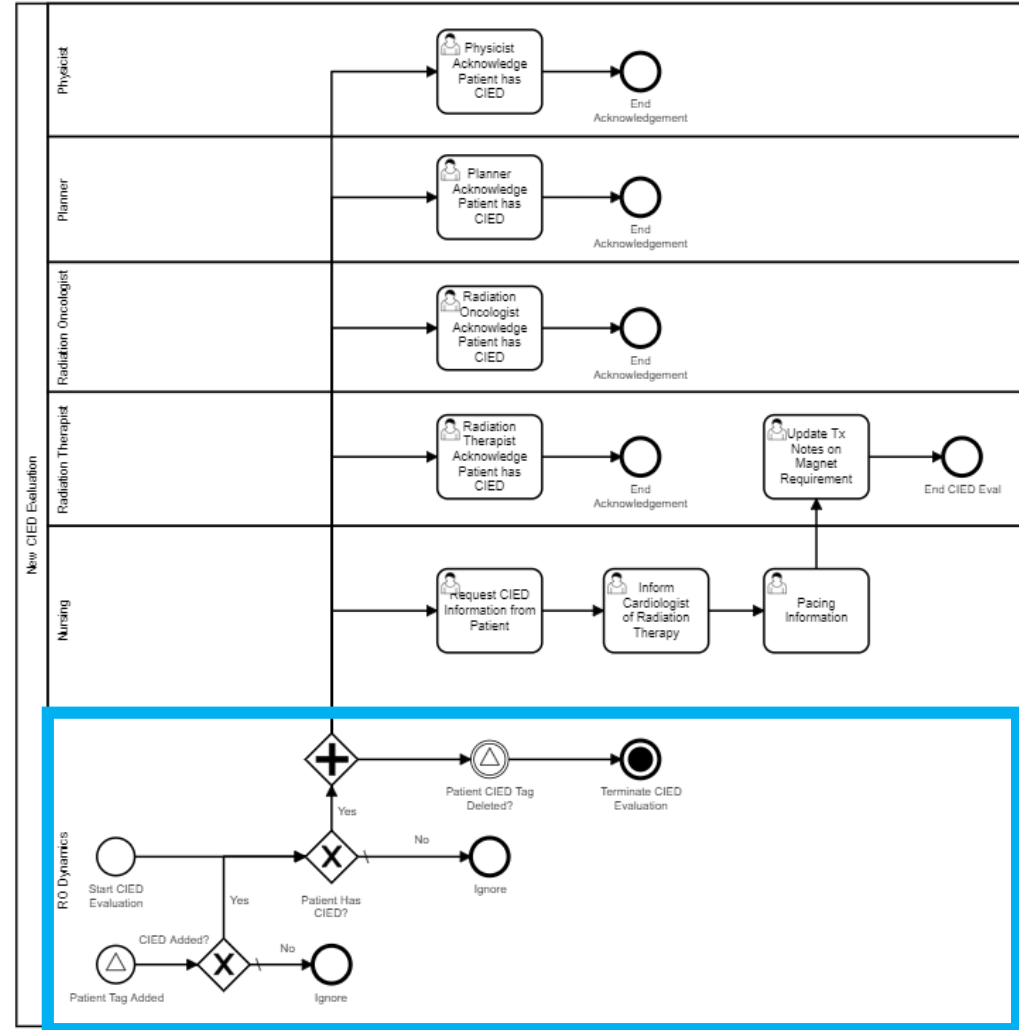
Patient	Dose region and risk category			
	<2 Gy	2-5 Gy	>5 Gy	Neutrons present
Pacing independent	Low risk	Medium risk	High risk	High risk
Pacing dependent	Medium risk	Medium risk	High risk	High risk

<https://aapm.onlinelibrary.wiley.com/doi/full/10.1002/mp.13838>

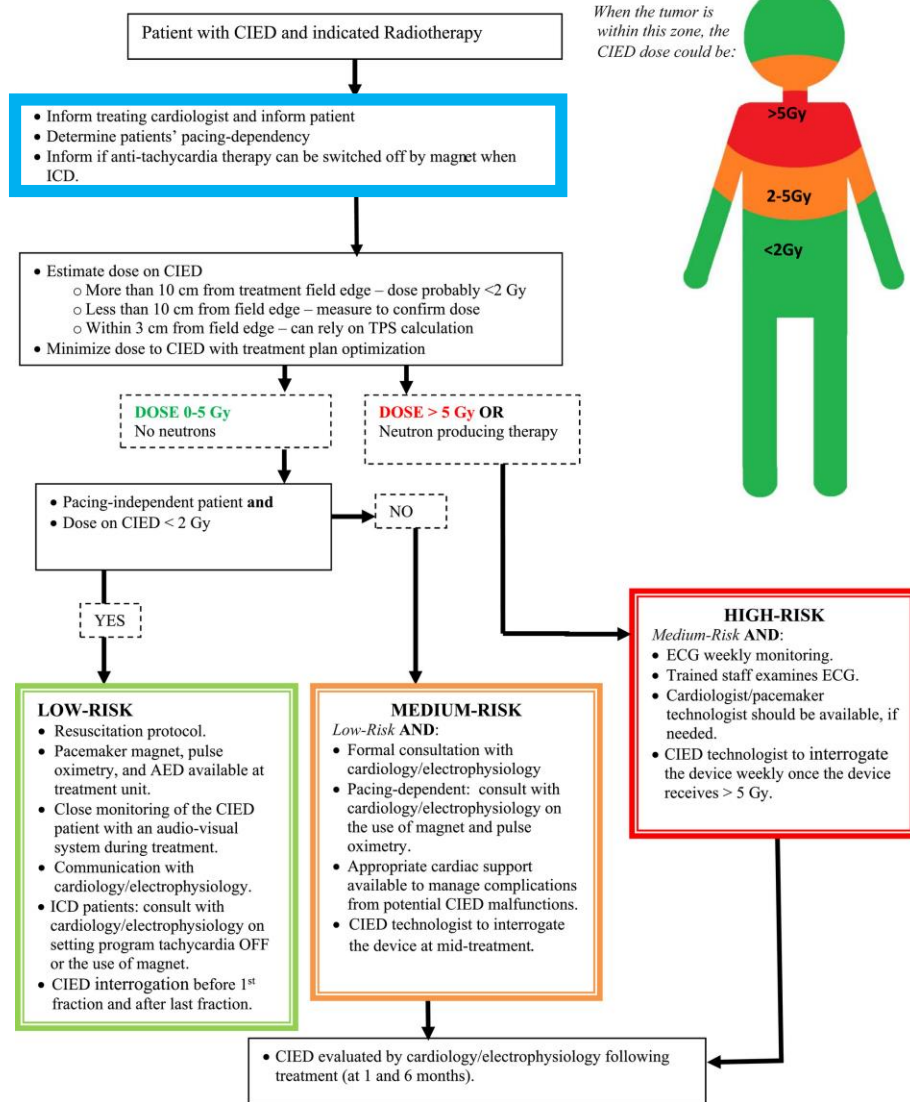
CIED Workflow in BPMN/DMN



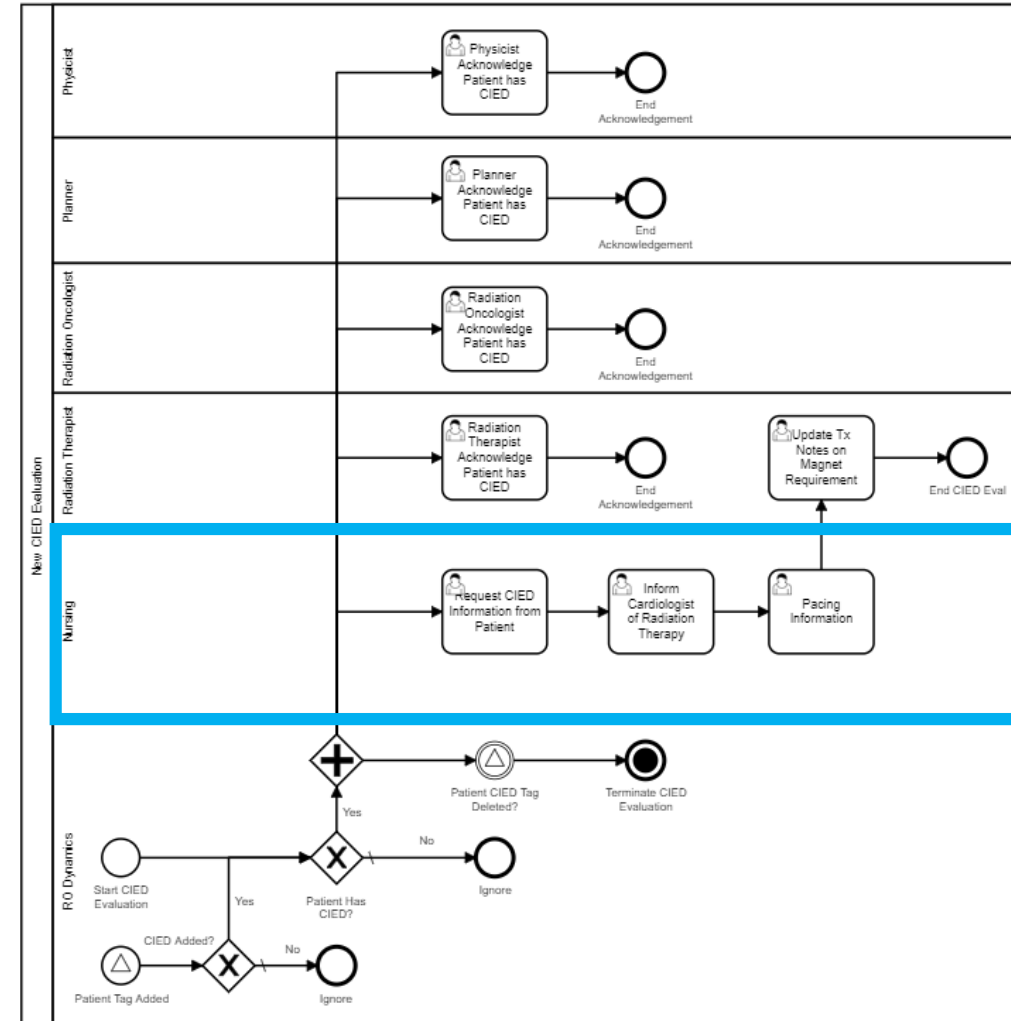
New CIED Evaluation



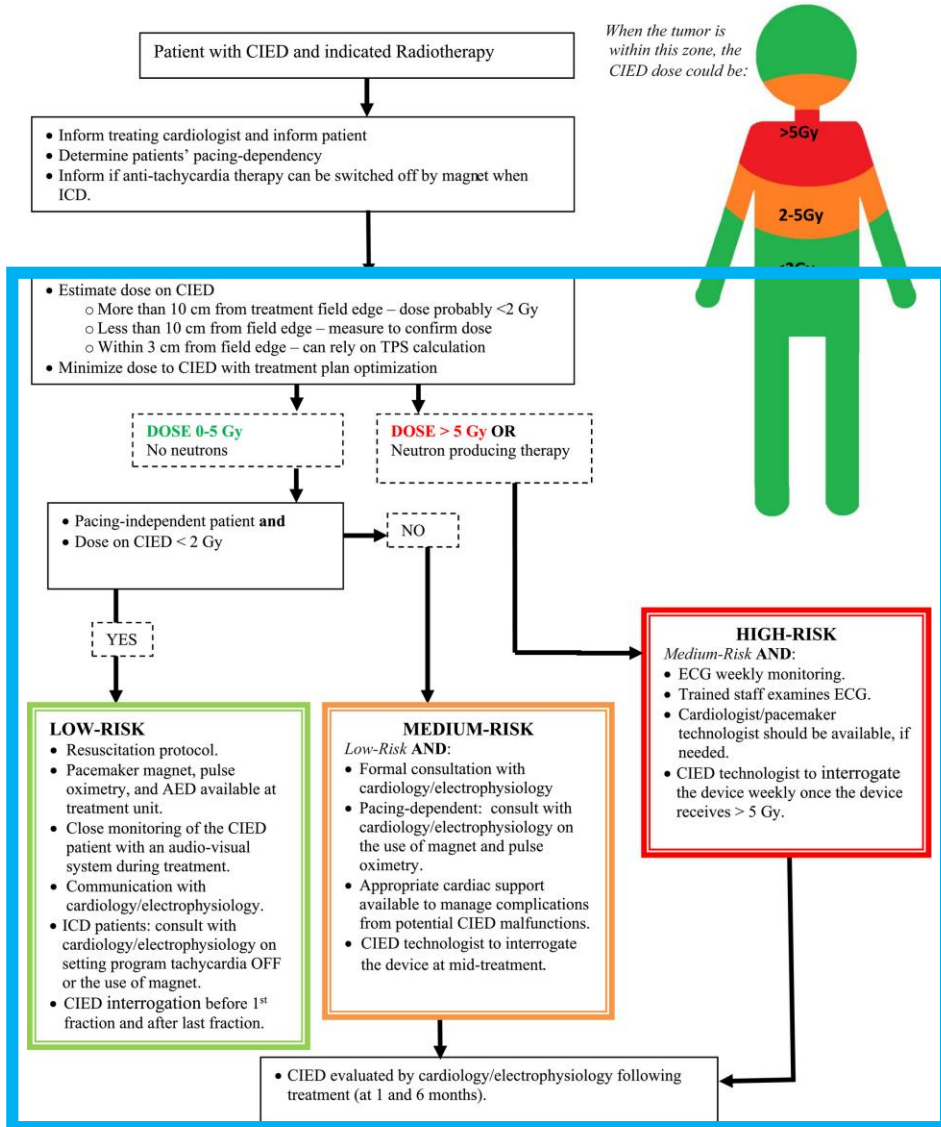
CIED Workflow in BPMN/DMN



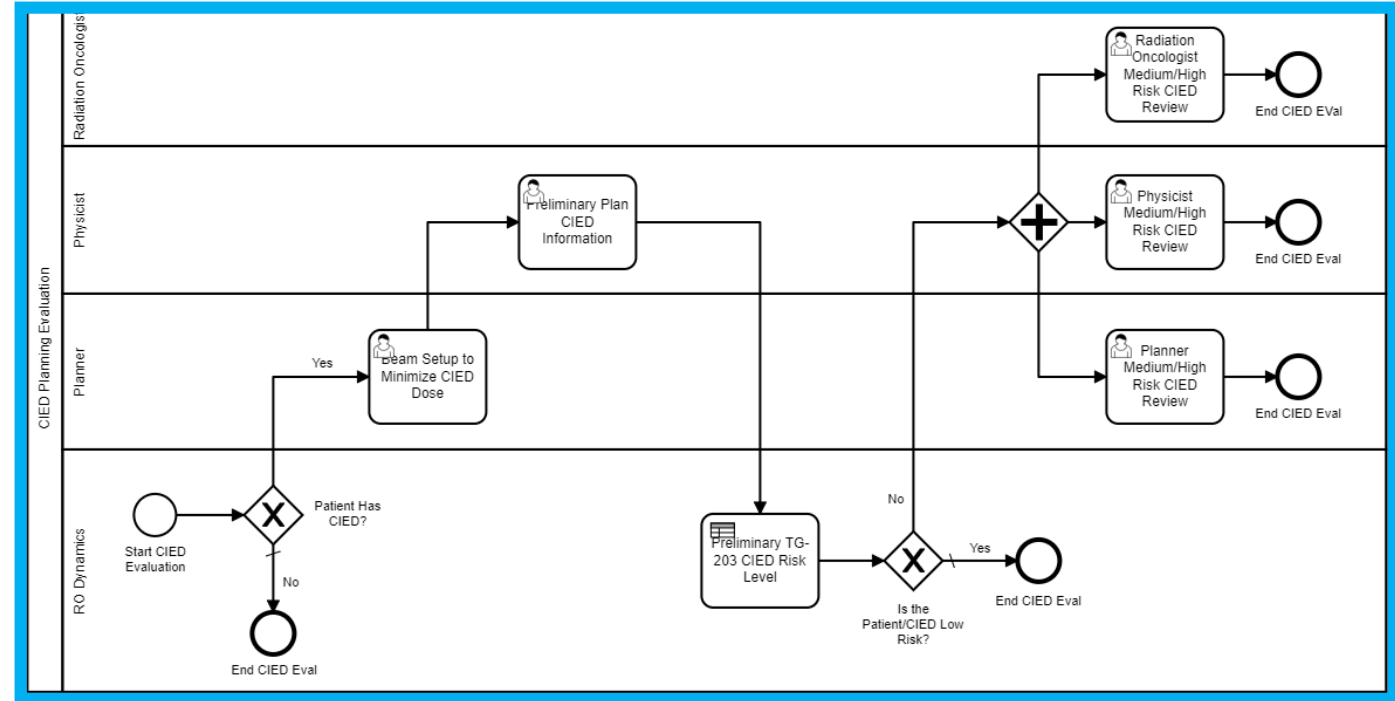
New CIED Evaluation



CIED Workflow in BPMN/DMN

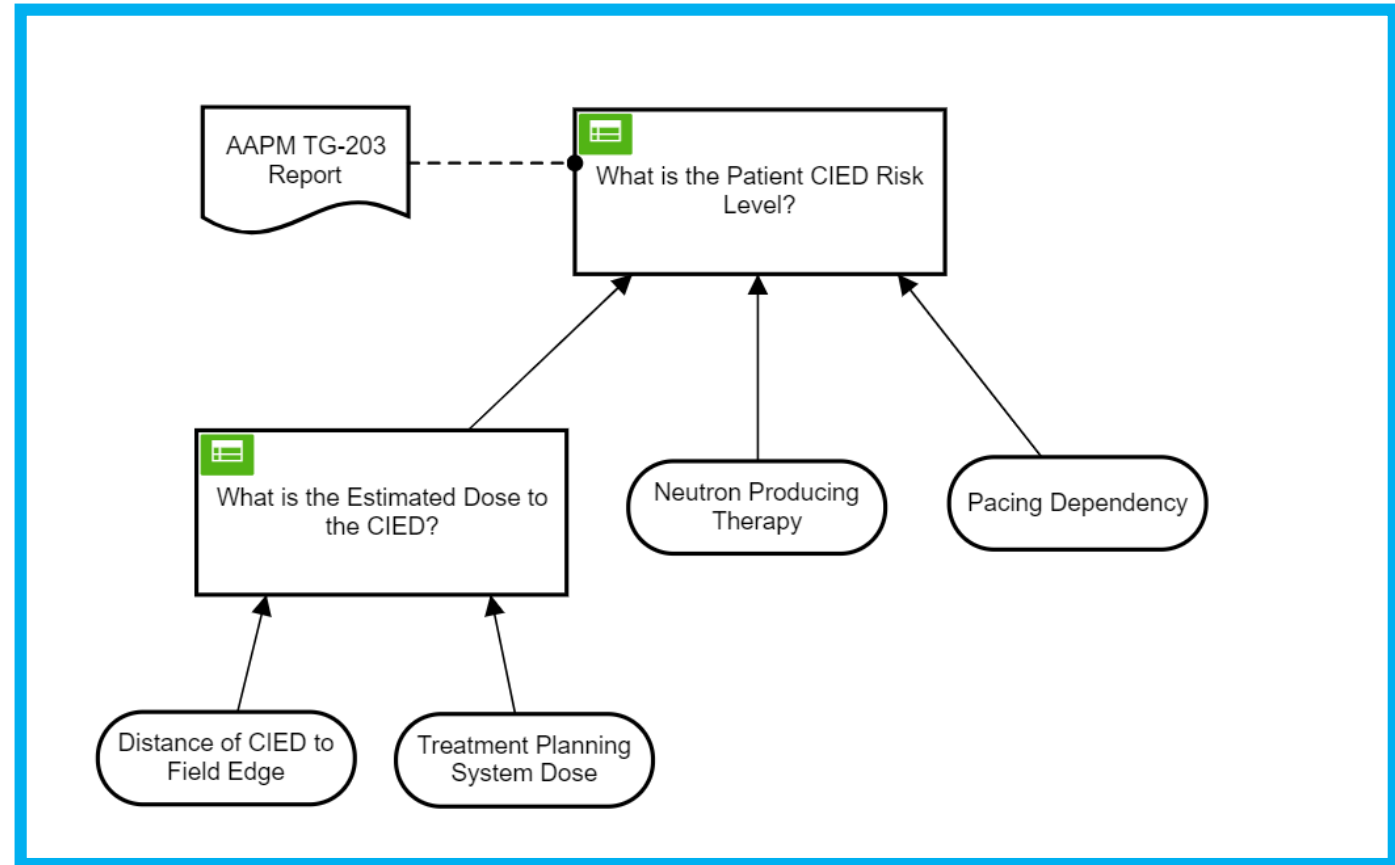
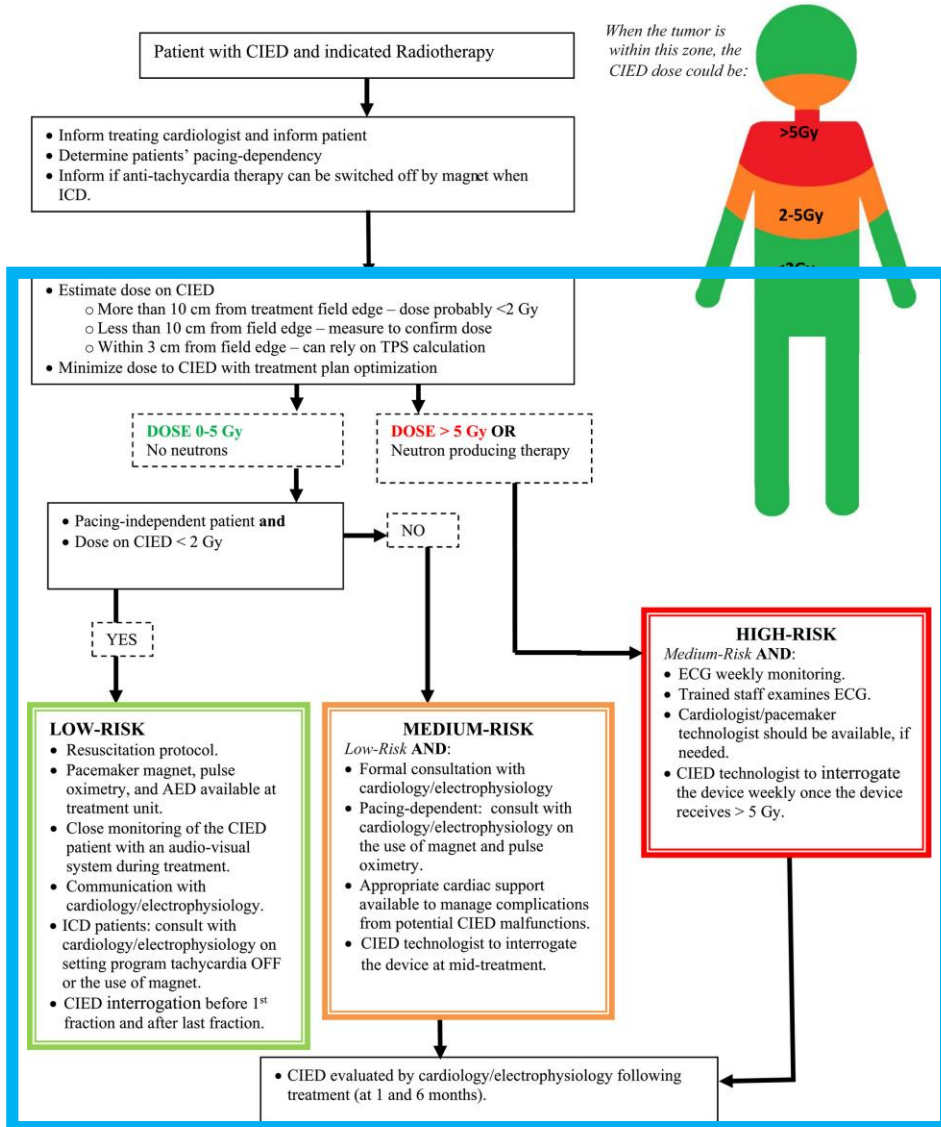


CIED Planning Evaluation



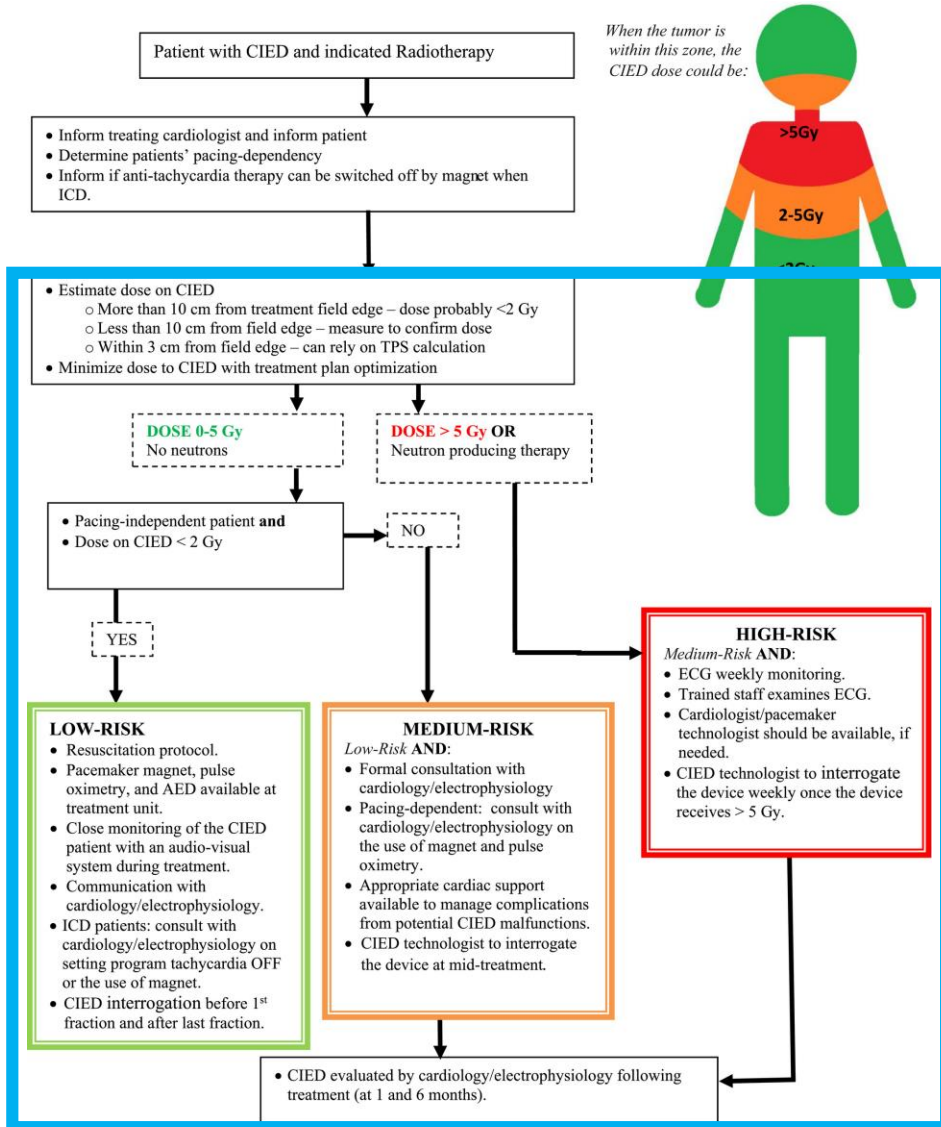
CIED Workflow in BPMN/DMN

CIED Planning Evaluation



CIED Workflow in BPMN/DMN

CIED Planning Evaluation



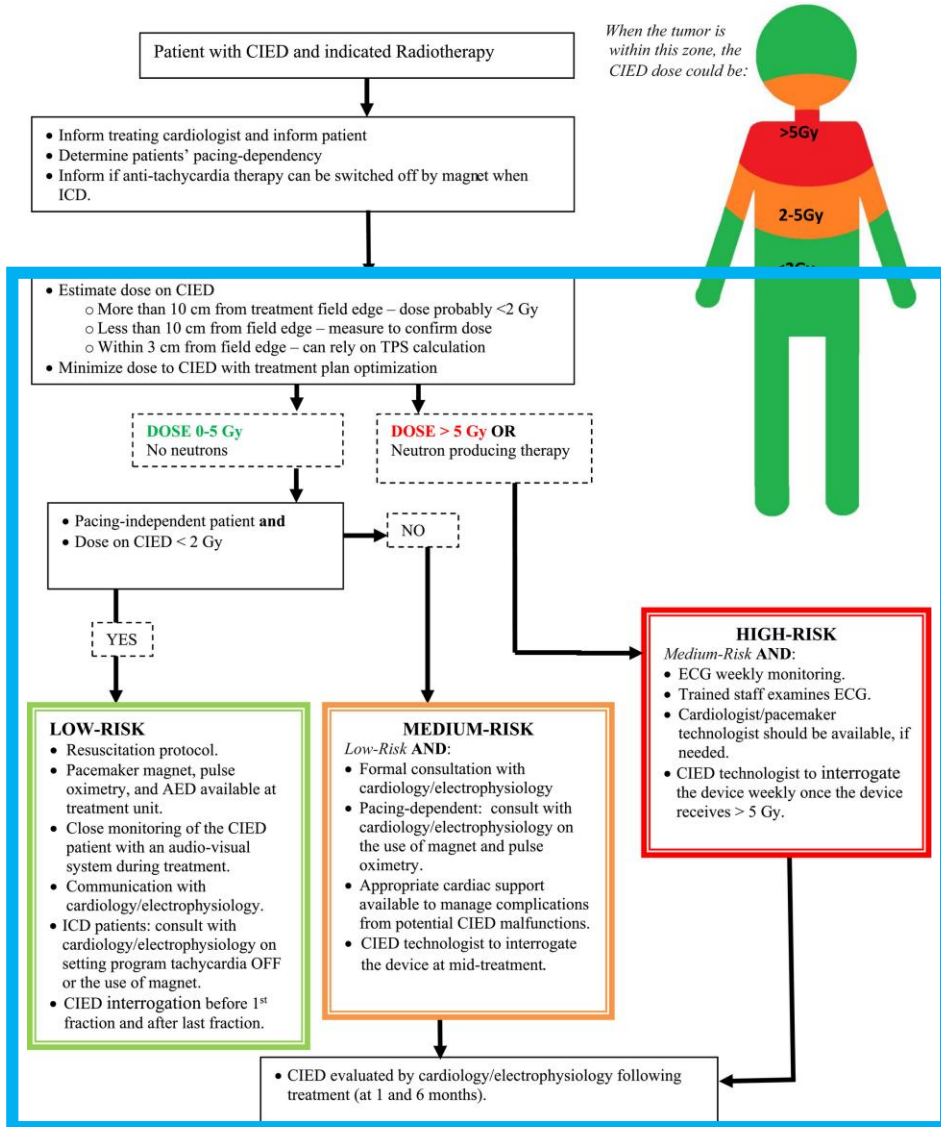
What is the Estimated Dose to the CIED?

CIEDEstimatedDose				
U	Input +		Output +	
	CIED Distance to Field Edge (cm) CIEDDistance	TPS Estimated Dose (cGy) CIEDTPSDose	CIED Estimated Dose (cGy)	CIED Measurement Required
	integer	integer	integer	boolean
1	>=10	-	199	false
2	(3..10)	-	CIEDTPSDose	true
3	<=3	-	CIEDTPSDose	false

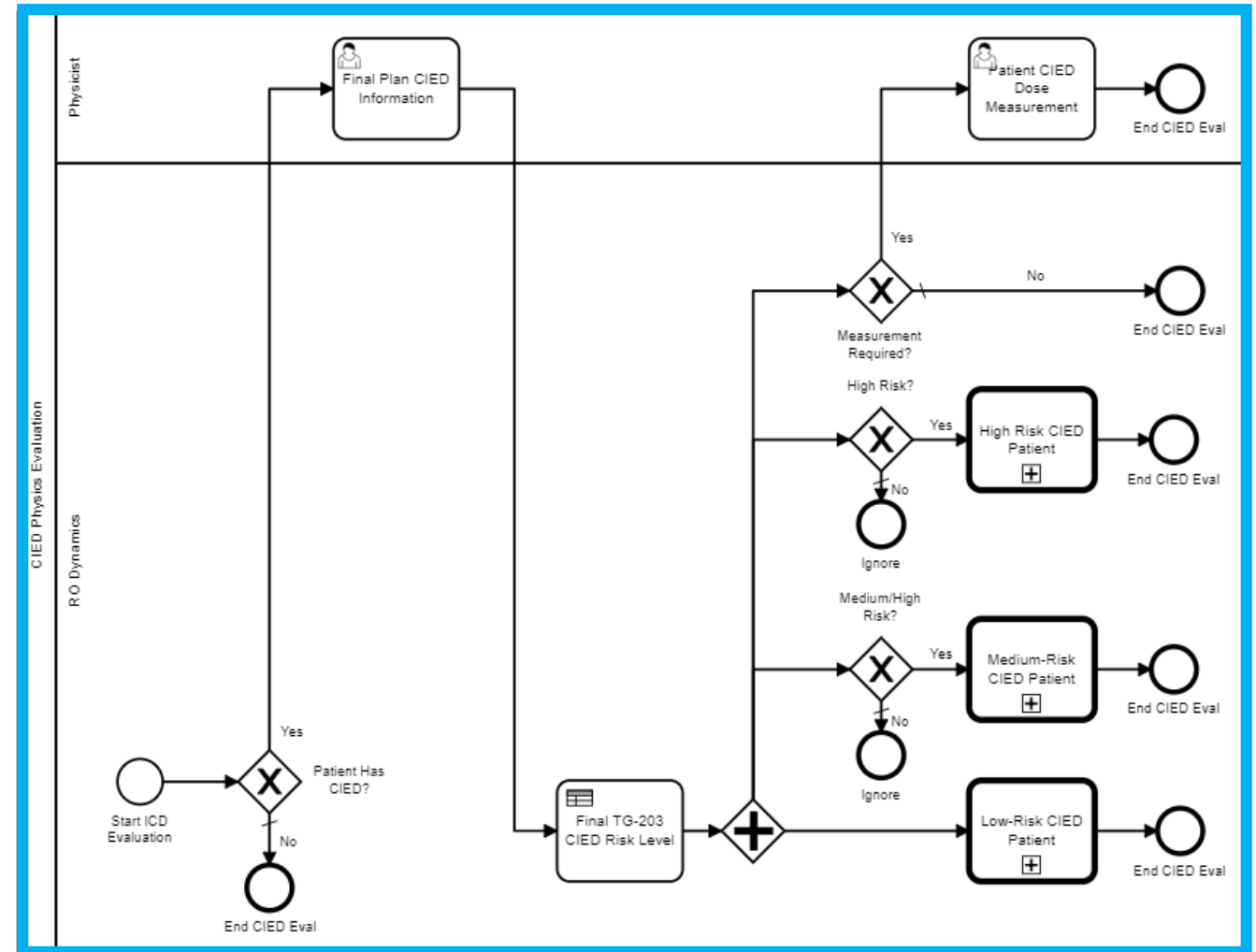
What is the Patient CIED Risk Level?

PatientCIEDRisk				
F	Input +			Output +
	CIED Estimated Dose (cGy)	Neutron Producing Therapy	Pacing Independent	Risk
	long	boolean	boolean	string
1	<200	false	true	"LOW"
2	(200..500)	false	-	"MEDIUM"
3	>500	-	-	"HIGH"
4	-	true	-	"HIGH"

CIED Workflow in BPMN/DMN



CIED Planning Evaluation



Live Demo

Customizable, Shareable Clinical Pathways with BPMN/DMN Now Possible in Radiation Oncology

Questions?

Contact

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