Project Eleven (Intensity-Modulated Radiation Therapy Project)

Checkpoint Presentation

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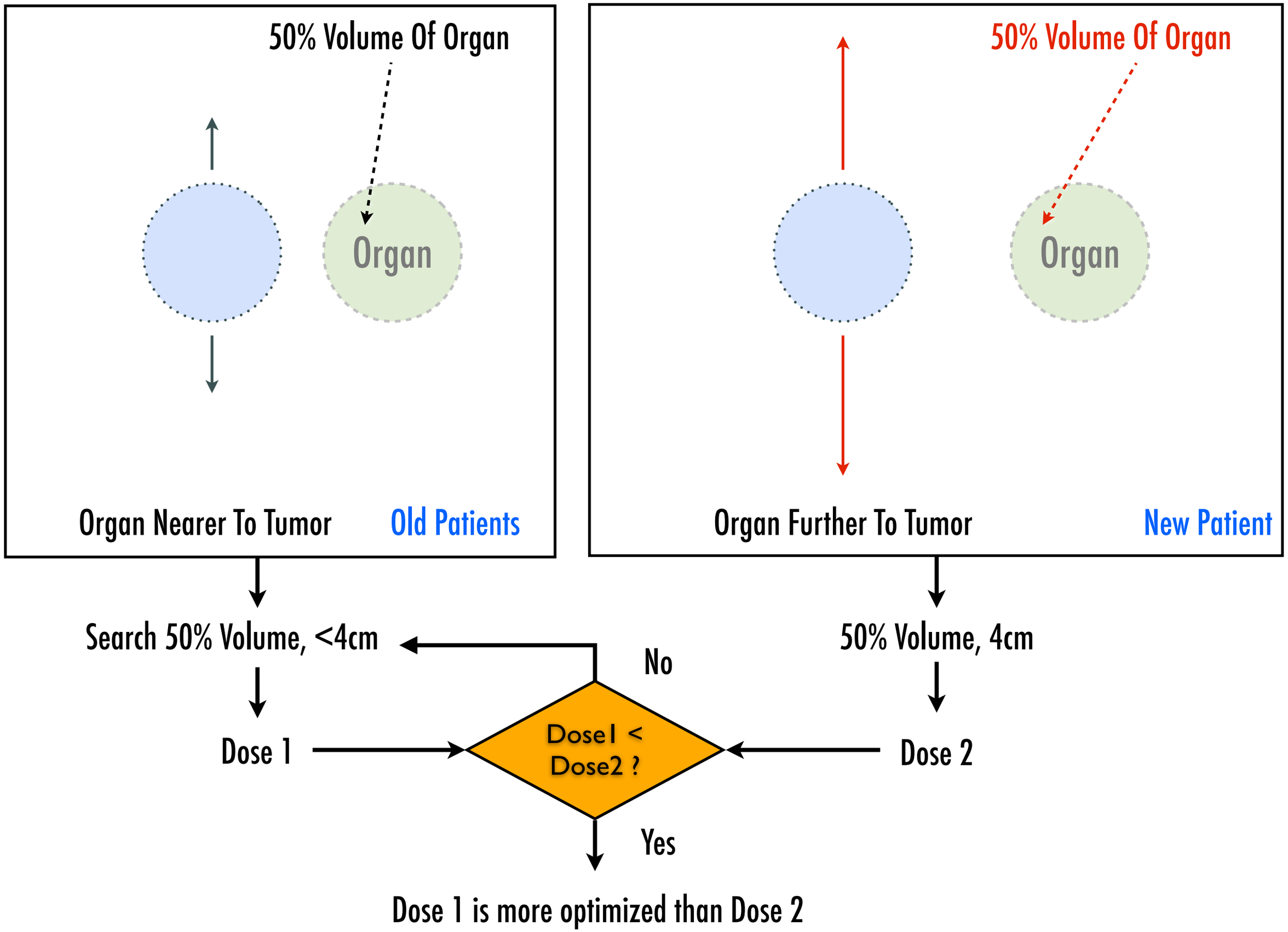
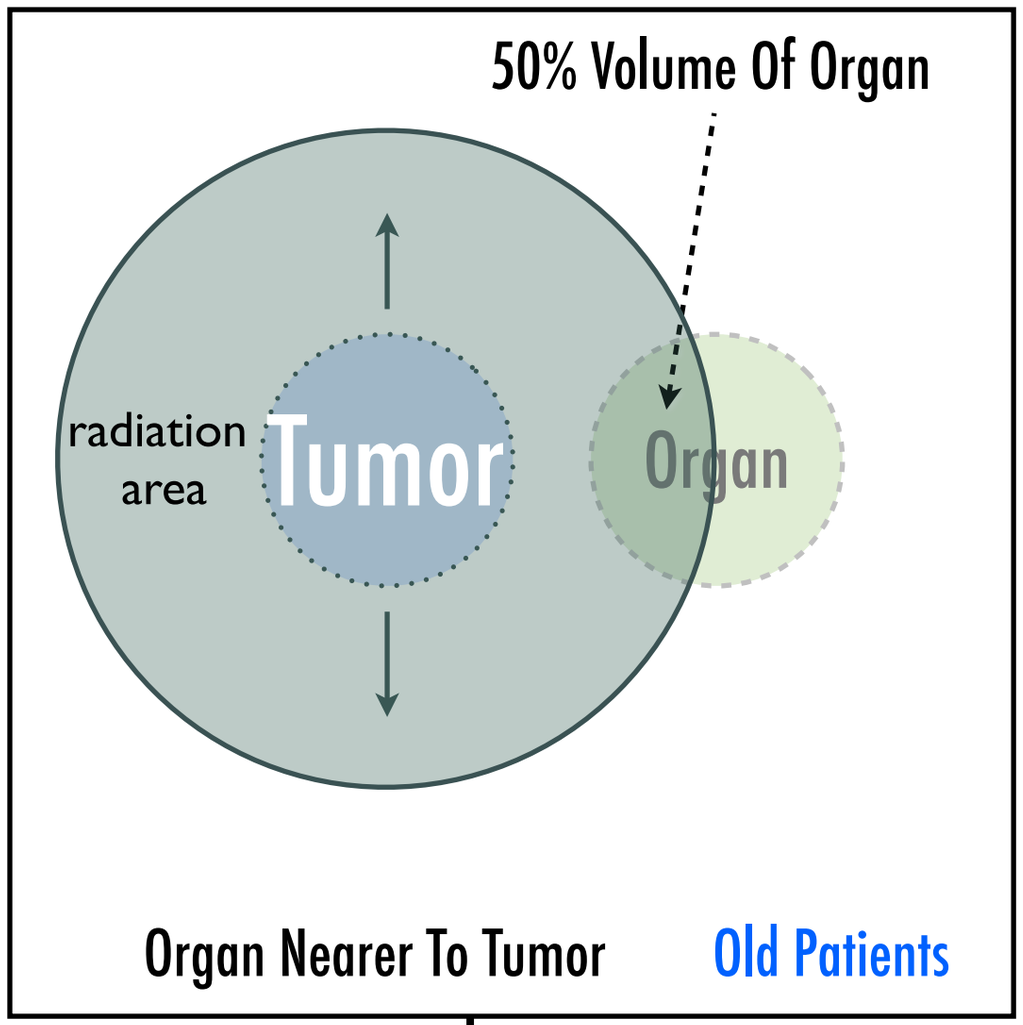
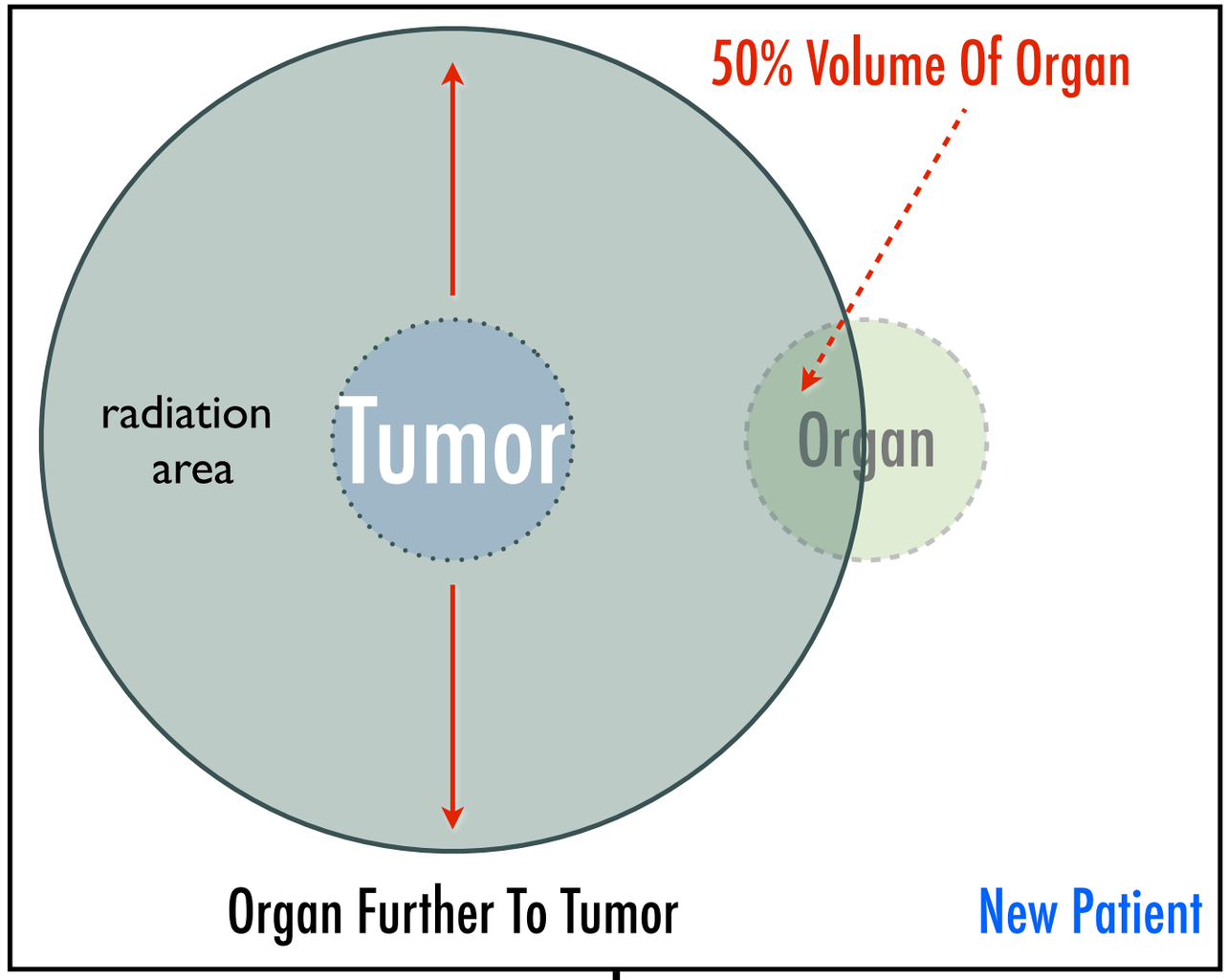
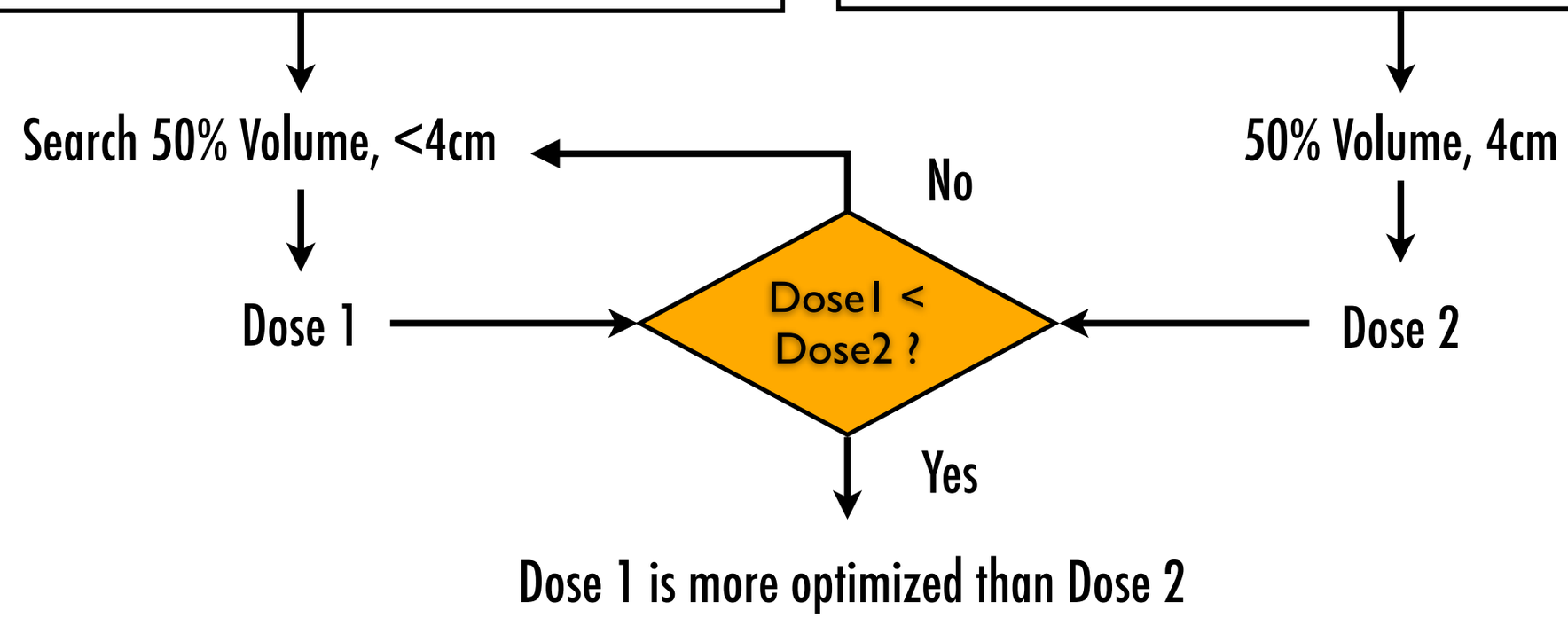

50% Volume Of Organ
Organ
Organ Nearer To Tumor
Old Patients
50% Volume Of Organ
Organ
Organ Further To Tumor
New Patient
Search 50% Volume, <4cm
50% Volume, 4cm
No
Dose 1
Dose1 < Dose2 ?
Dose 2
Yes
Dose 1 is more optimized than Dose 2


50% Volume Of Organ
radiation area
Tumor
Organ
Organ Nearer To Tumor
Old Patients


50% Volume Of Organ
radiation area
Tumor
Organ
Organ Further To Tumor
New Patient


Search 50% Volume, <4cm
50% Volume, 4cm
No
Dose 1
Dose1 < Dose2 ?
Dose 2
Yes
Dose 1 is more optimized than Dose 2

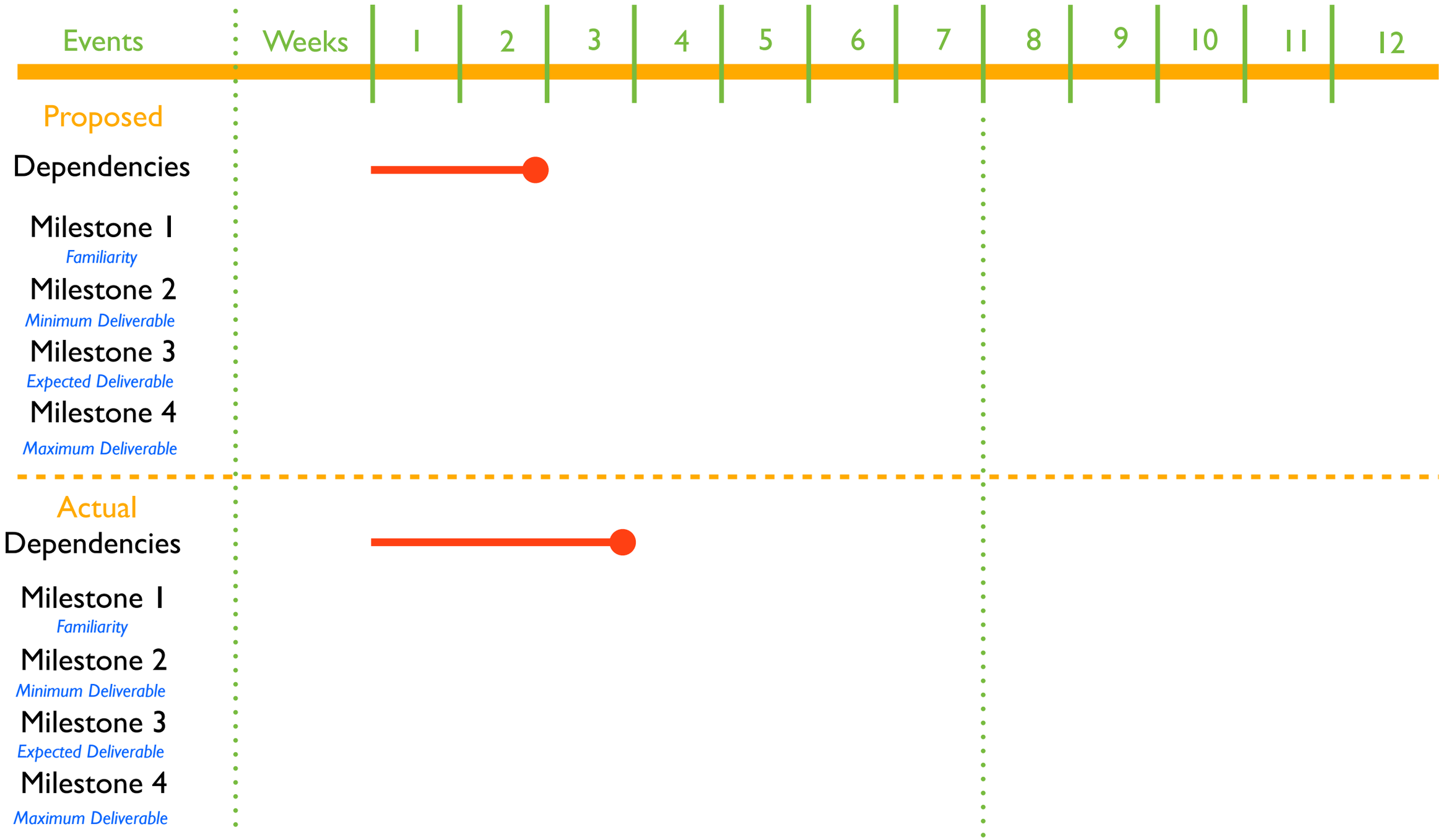
Deliverable(Goal) Updates

	Original	New
Minimum	Python Package That Can Pull Correct Optimized Plan From Database	Didn't Change
Expected	Integrated SQL Search Method For Minimum Achievable Dose Into The Package Instead Of Using Linear Search	Update: Enhance other functions using SQL as well (r function for calculating distance and d function for calculating dose)
Maximum	Direct Clinical Use Features (Pinnacle 3 scripts generating; Effectiveness measures evaluated)	Update: Pinnacle 3 script generating, hot and cold spot killing; possible in developing GUI; not feasible for full effectiveness measures evaluation, efficiency can be measured, effectiveness needs followup of clinicians and patients.

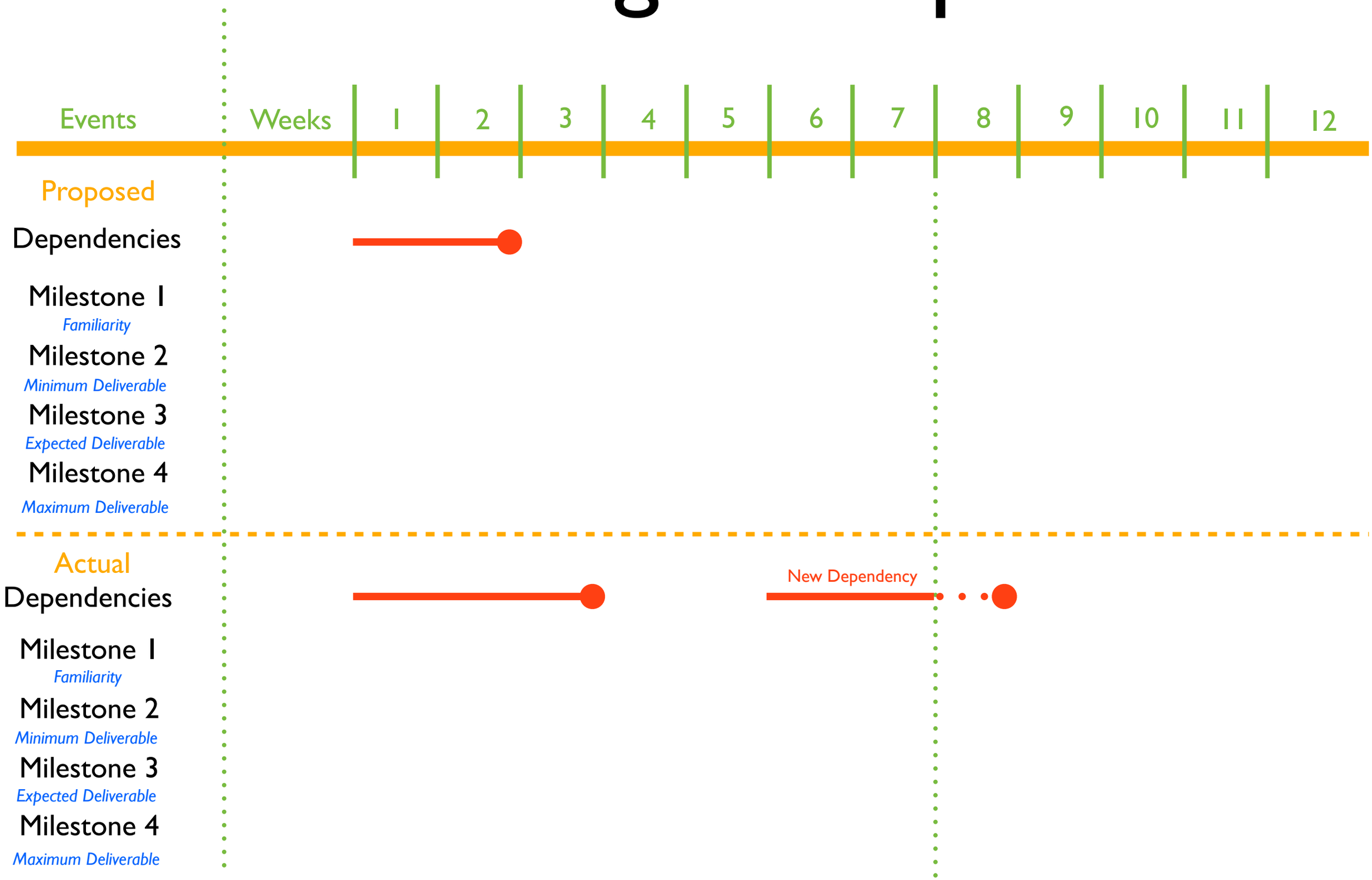
Work Progress Updates

Events	Weeks	1	2	3	4	5	6	7	8	9	10	11	12
Proposed													
Dependencies													
Milestone 1 *Familiarity*													
Milestone 2 *Minimum Deliverable*													
Milestone 3 *Expected Deliverable*													
Milestone 4 *Maximum Deliverable*													
Actual													
Dependencies													
Milestone 1 *Familiarity*													
Milestone 2 *Minimum Deliverable*													
Milestone 3 *Expected Deliverable*													
Milestone 4 *Maximum Deliverable*													

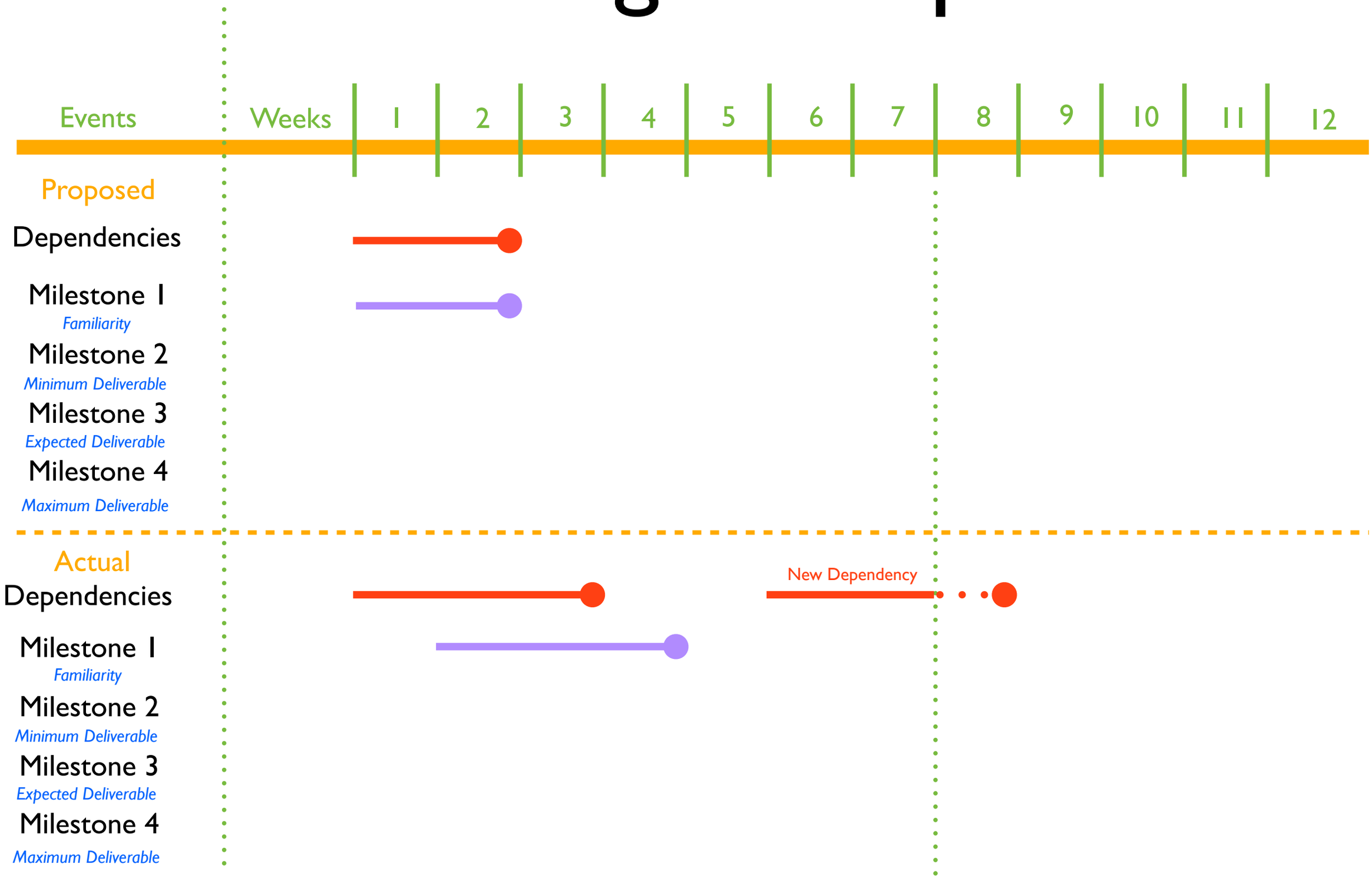
Work Progress Updates



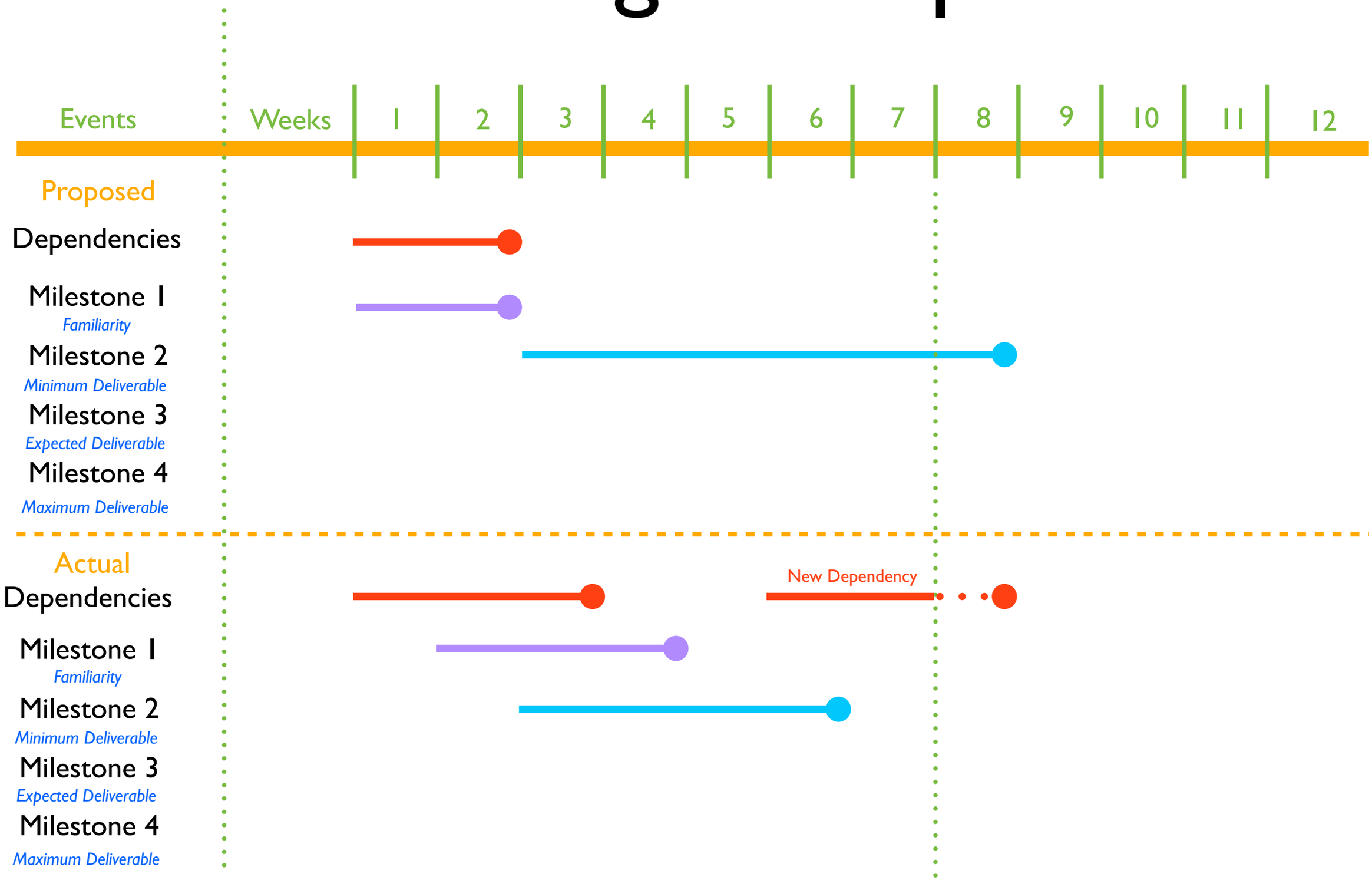
Work Progress Updates



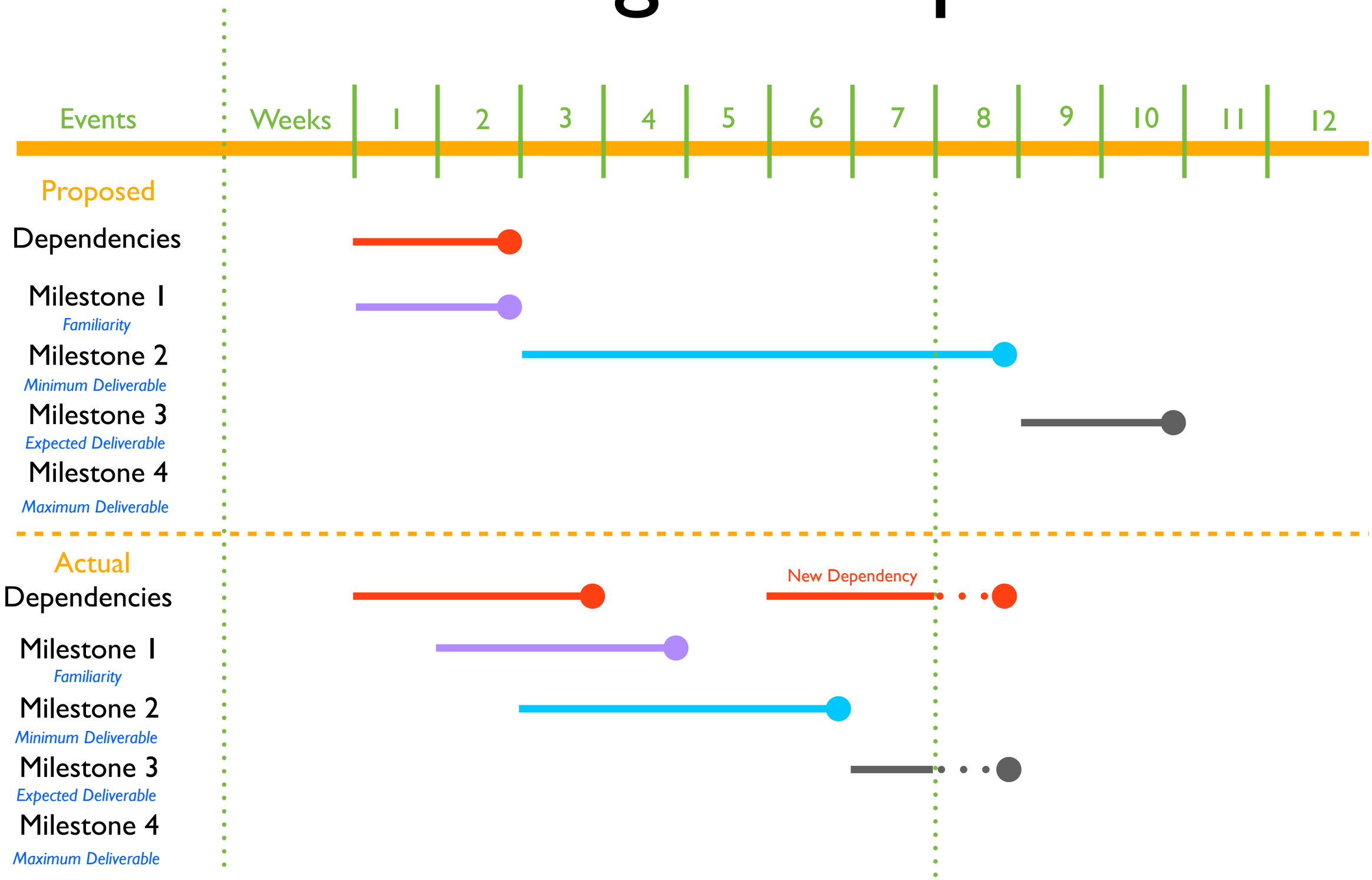
Work Progress Updates



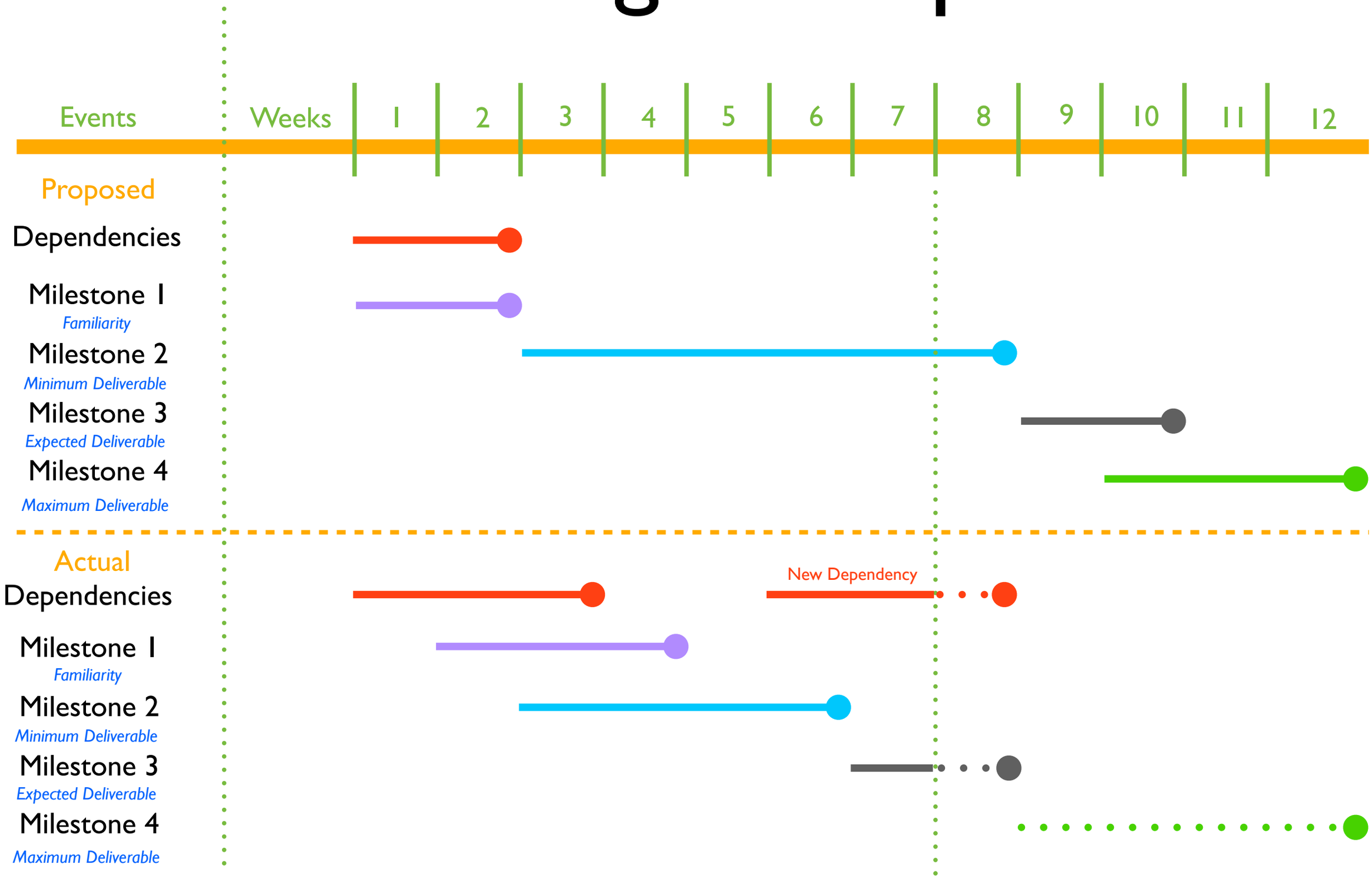
Work Progress Updates



Work Progress Updates



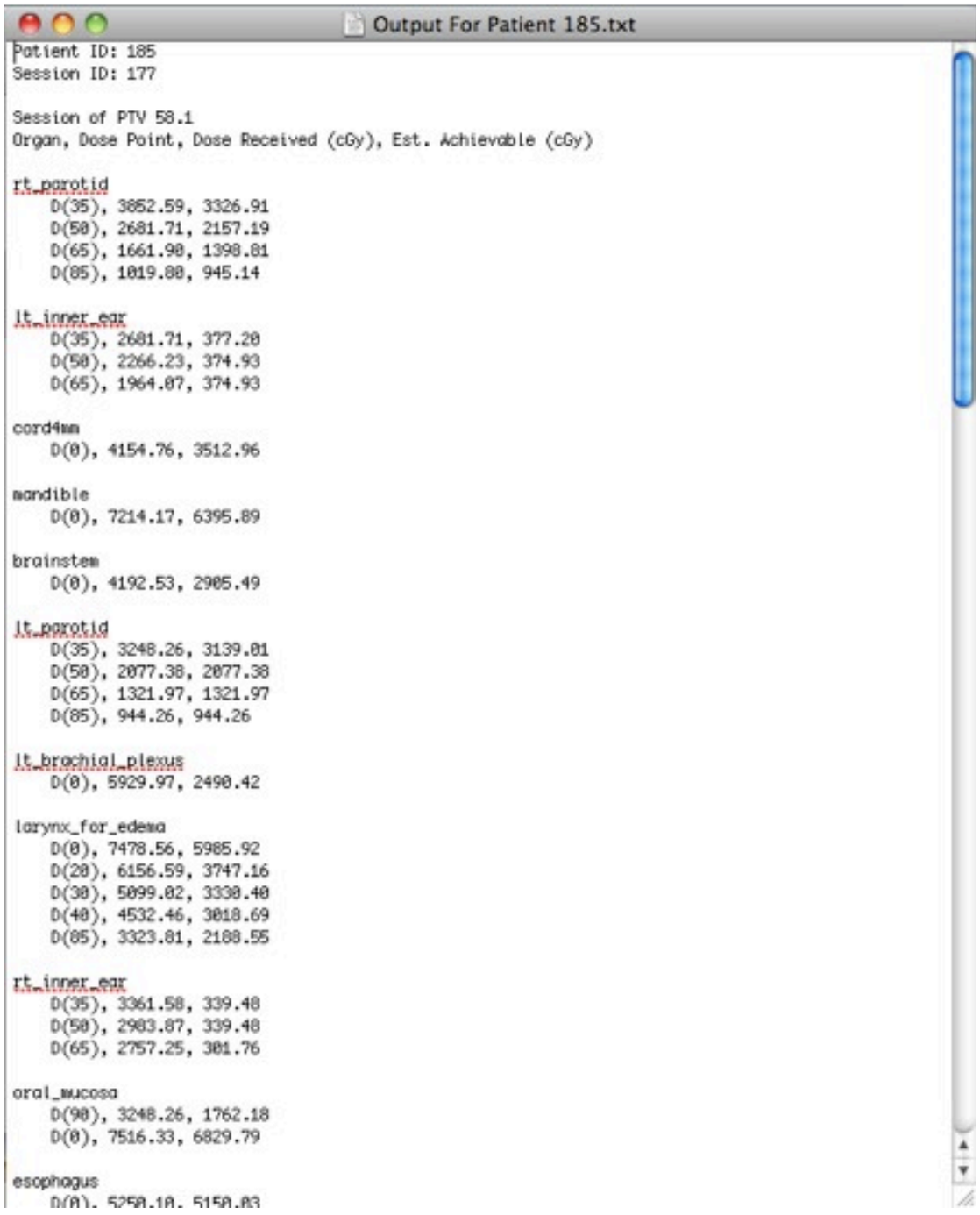
Work Progress Updates



What Has Been Done

- Python Package that will correctly pull out data from head and neck database based on linear search methods (takes an hour to run) in test database
- SQL implementation for minimum achievable dose calculation, works well in test database (takes 5-8 minutes to run)

Results View



Results(2)

Session of PTV 58.1

Organ, Dose Point, Dose Received (cGy), Est. Achievable (cGy)

rt_parotid

D(35), 3852.59, 3326.91

D(50), 2681.71, 2157.19

D(65), 1661.90, 1398.81

D(85), 1019.80, 945.14

Means for right parotid, the dose can be at least 3326.91 instead of 3852.59 for 35% of the volume of organ at risk in this radiotherapy session, dose decreased 500cGy

Minimum Deliverable-- Takes An Hour To Calculate All 13 Organs

Results(3)

Session of PTV 70

Organ, Dose Point, Dose Received (cGy), Est. Achievable (cGy)

rt_parotid

D(35), 4388.48, 3859.43

D(50), 2875.21, 2875.21

D(65), 2421.23, 1992.51

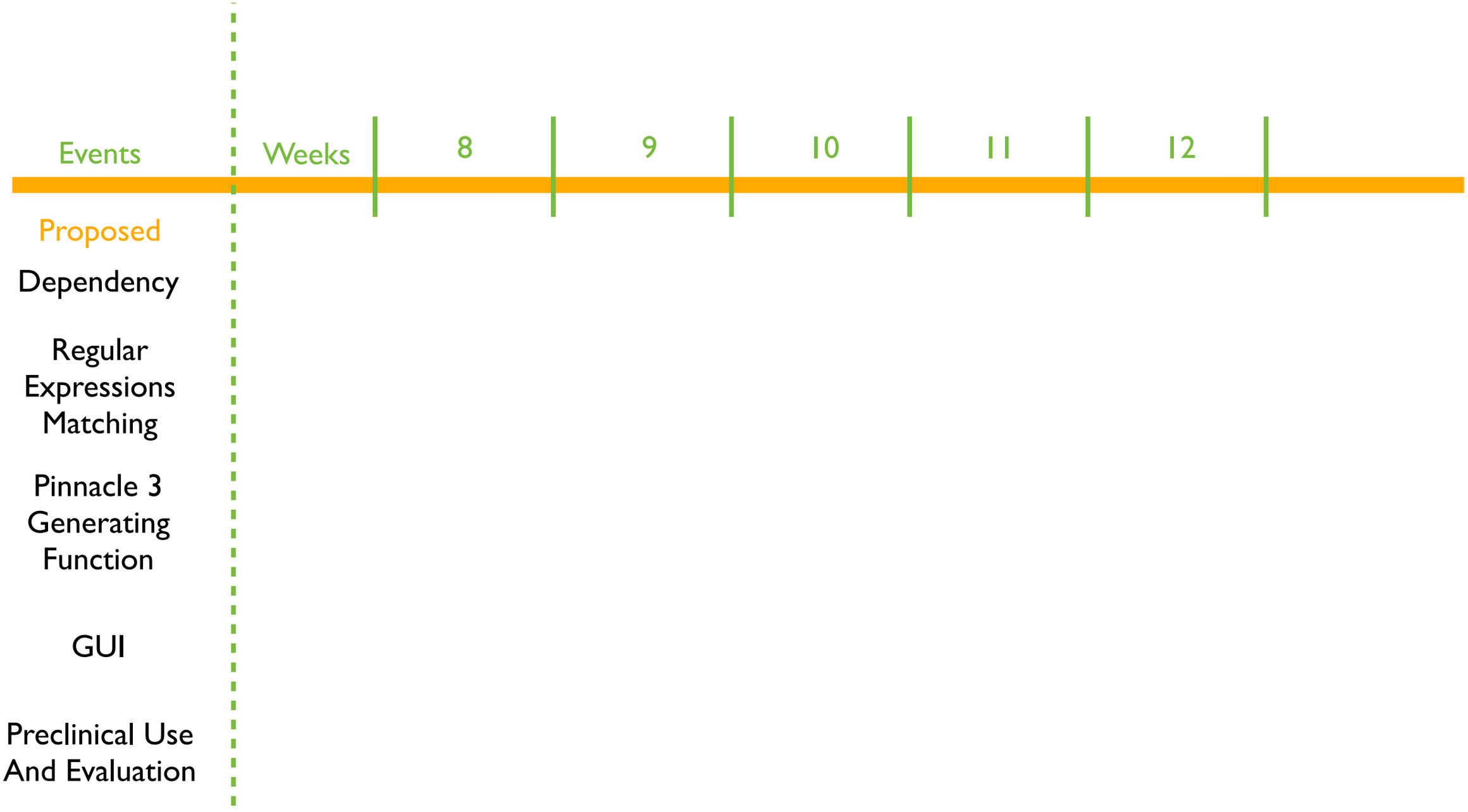
D(85), 2042.91, 1315.05

Expect Deliverable-- Takes 5-8 minutes To Calculate All Organs

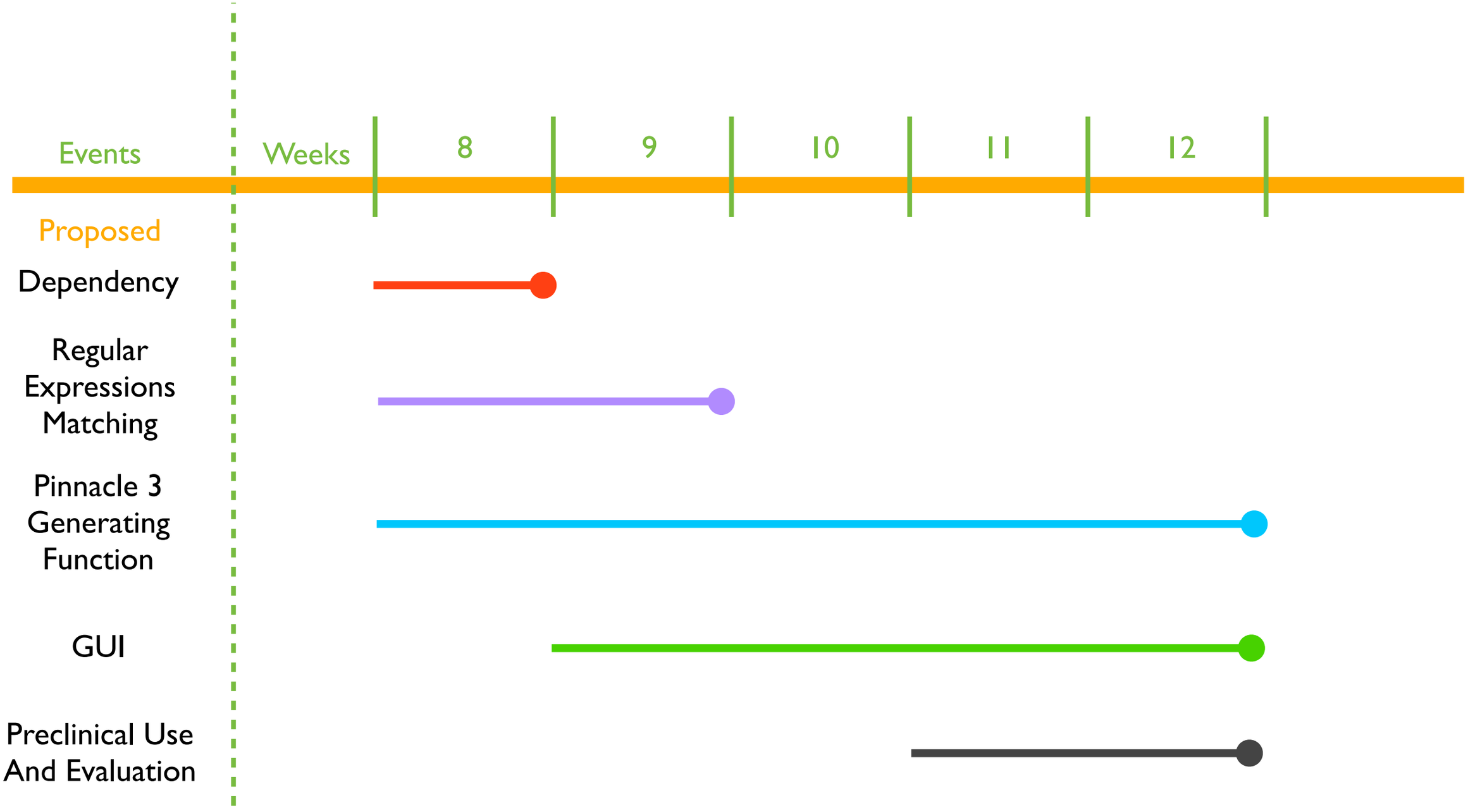
What Will Be Done

- Actual database target and organ at risk identification(a lot of target and organ naming variability, needs large amount of name matching)
- Pinnacle 3 script generating code implemented
- Wrap up (GUI development) and put into pre-clinical use

Remaining Work Timeline



Remaining Work Timeline



Thank You !

Questions?