

## Motivation

- Effective intra-fractional motion management via real-time MLC and Couch tracking
- Ensure high dosimetric accuracy while minimizing patient discomfort

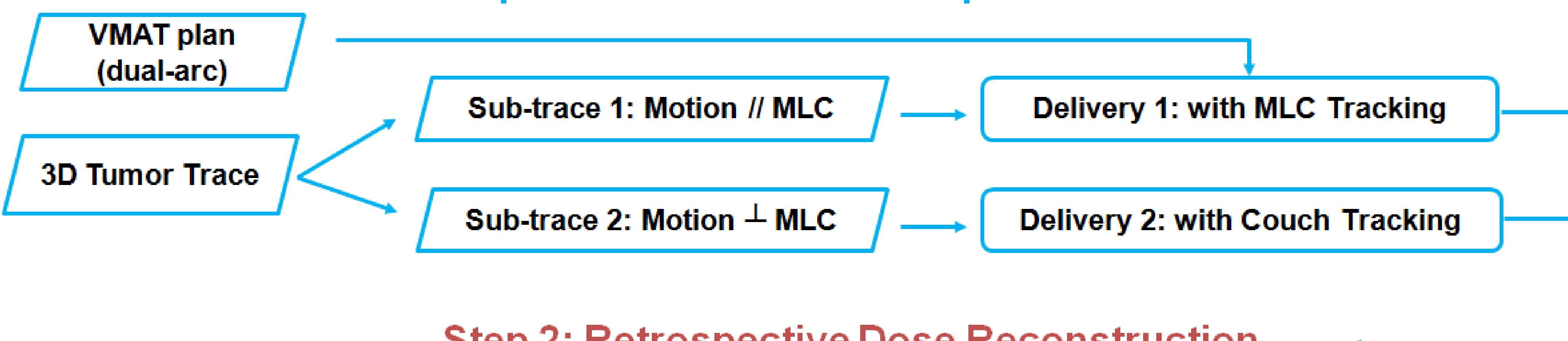
## Proposed Method

- Complimentary MLC and couch tracking during the same delivery

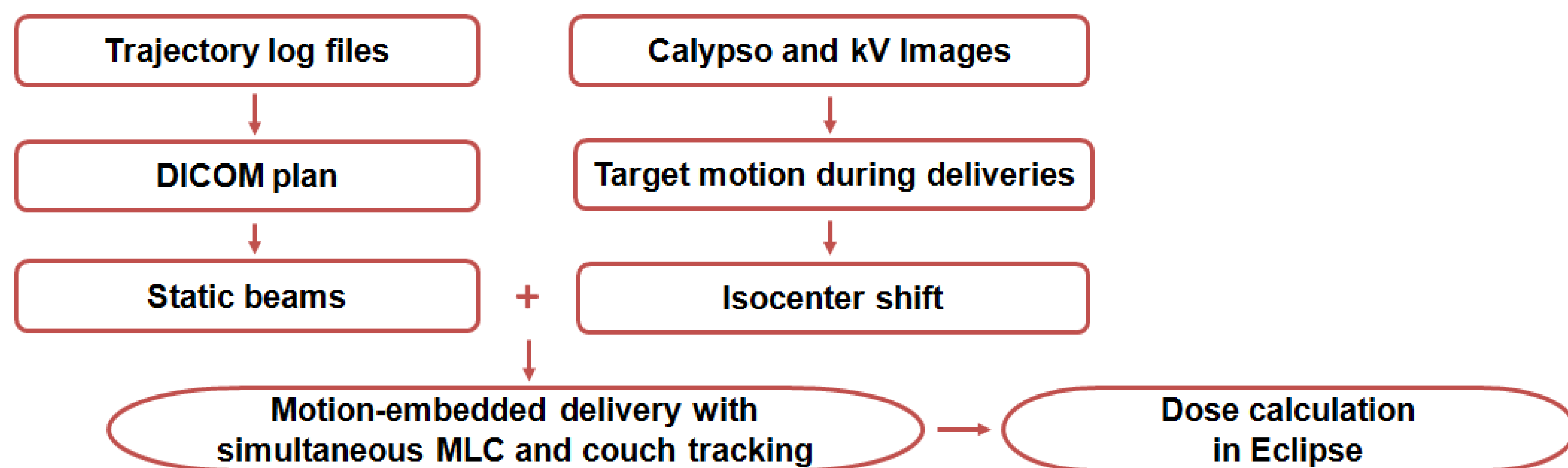
## Method

- Varian *iTools Tracking* prototype system in TrueBeam Developer Mode

### Step 1: Measurements – Sequential Deliveries

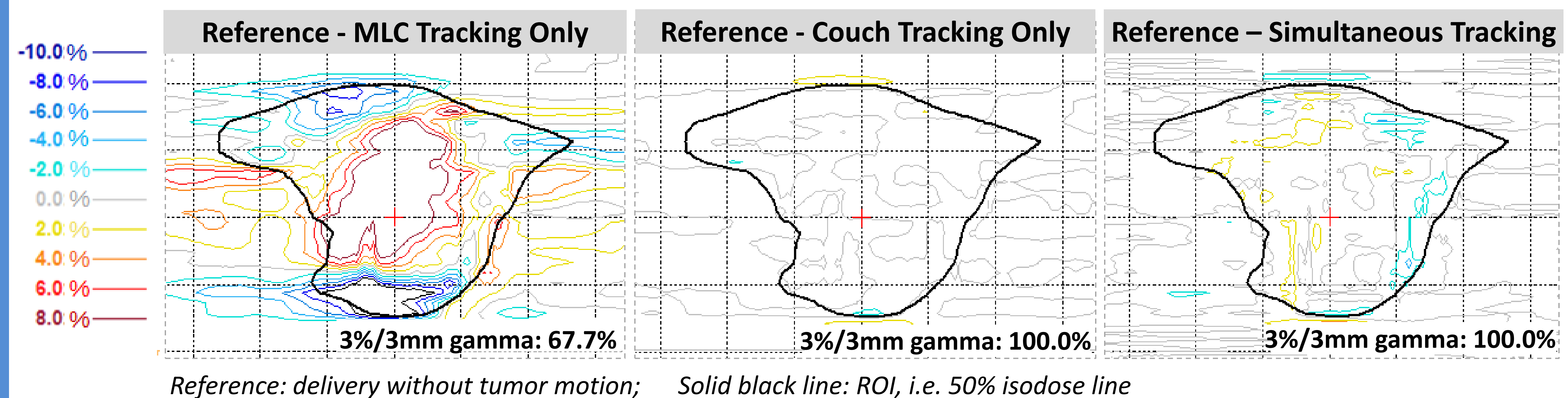


### Step 2: Retrospective Dose Reconstruction



## Key Findings

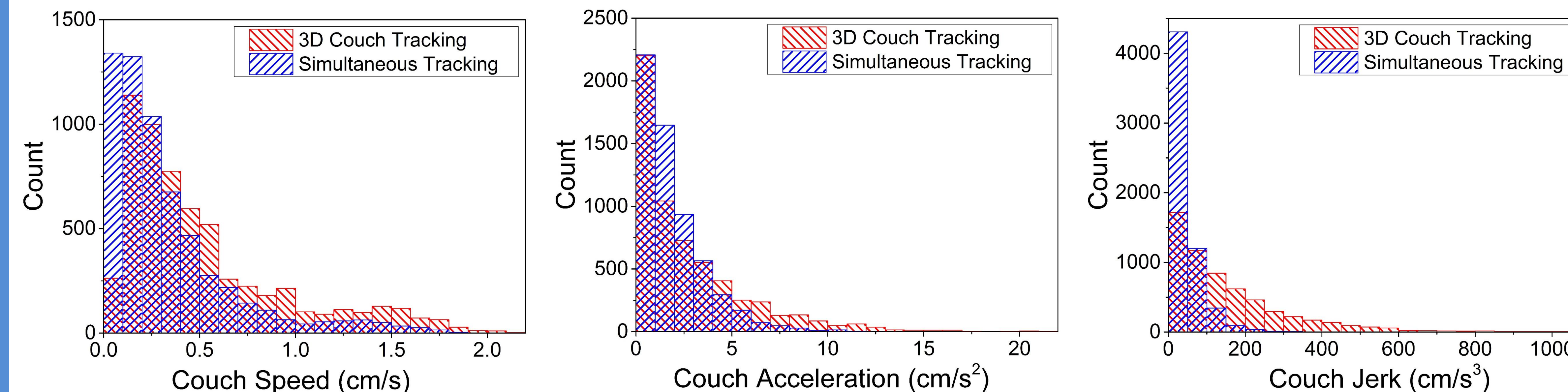
### 1. Significant improvement in dosimetric accuracy compared to MLC tracking only



Result summary: Gamma passing rate (mean ± SD) based on comparison to reference

Criteria	No Tracking	MLC Tracking Only	Couch Tracking Only	Simultaneous Tracking
3%/3mm	65.4% ± 10.8%	76.7% ± 12.8%	100.0% ± 0%	100.0% ± 0%
2%/2mm	45.0% ± 10.2%	62.3% ± 11.3%	100.0% ± 0%	98.5% ± 0.2%

### 2. Major reduction in couch oscillation and patient discomfort compared to couch tracking only



## Disclosure

This work was partially funded by Varian Medical Systems (Palo Alto, CA) and NIH/NCI Cancer Center Support Grant P30 CA008748

## Clinical Perspectives:

- Feasible for compensating highly oscillating target with large motion magnitude
- Potential treatment sites: lung and GI tumors