



# Motion Management Questionnaire

Quality Assurance Review Center  
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This questionnaire addresses your institution's ability to participate in clinical trials that require accounting for intra-fraction lesion motion. Please complete the following questionnaire in sufficient detail so that the methodology you are using for managing respiratory motion is clear. The questionnaire is not protocol specific; it will suffice for all protocols requiring management of lesion motion due to respiration.

Institution: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip Code: \_\_\_\_\_ Country: \_\_\_\_\_

Person completing this questionnaire: \_\_\_\_\_

\_\_\_\_Physicist      \_\_\_\_Radiation Oncologist      \_\_\_\_Dosimetrist

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

## I. Experience:

What is the general category of technique that you use to manage the effects of respiratory motion? (e.g., gated to spirometer readings)

How many patients have you treated using techniques for managing respiratory motion?

\_\_\_\_\_

For which target volume sites have you employed respiratory motion management?

\_\_\_\_Lung      \_\_\_\_Liver      \_\_\_\_Pancreas      Other: Please list: \_\_\_\_\_

What criteria do you use to select patients for respiratory motion management?

What immobilization do you use?

How do you verify accurate setup positioning of the patient?

What accelerator do you use for these treatments?

What is the beam energy \_\_\_\_\_MeV?

If using a MLC, what is the leaf width? \_\_\_\_\_

What treatment planning system is used for planning these treatments? \_\_\_\_\_

## II. Overall Technique

A. What is your method of assessing motion of the lesion with respiration?

- \_\_\_\_\_ Fluoroscopy  
For 2D motion (one fluoro angle) \_\_\_\_\_  
Or 3D motion (two or more fluoro angles) \_\_\_\_\_
- \_\_\_\_\_ 4D CT
- \_\_\_\_\_ Inspiration/expiration fast-CT scan
- \_\_\_\_\_ Other: Please describe:

B. What type of CT scan is used for treatment planning?

- \_\_\_\_\_ Standard CT scan
- \_\_\_\_\_ 4D CT
- \_\_\_\_\_ Inspiration/expiration fast-CT scan
- \_\_\_\_\_ Slow-CT scan (multiple respiration cycles per slice)
- \_\_\_\_\_ Other: Please describe:

C. What is your method of managing motion of the lesion with respiration?

- Nothing other than increased margins for PTV definition
- Forced shallow breathing using abdominal compression
- Gating of treatment with breathing cycle
  - Active breathing control (ABC)
  - Self-held breath-hold with respiratory monitoring (e.g., RPM)
  - Gating during free breathing using external monitors or implanted fiducials
  - Other: Please describe:

- Tracking motion by:
  - Moving the beam (e.g. Cyberknife)
  - Moving the MLC's
  - Moving the patient to follow the target

### III. Specifics of the Assessment of Motion due to Respiratory Motion

Is assessment performed for every patient?  Yes  No

How frequently is assessment performed?

- Only prior to treatment planning
- Other: Please specify:

What is used to assess the motion?

- Lesion itself
- Anatomic correlates
  - Diaphragm
  - Chest wall
  - Other please specify:

- Implanted fiducial markers
  - How many? \_\_\_\_\_ What size \_\_\_\_\_ mm
  - What material? \_\_\_\_\_
  - Other. Please specify:

Who analyzes and assesses the amount of motion?

- Radiation Therapist (or simulator technologist)
- Radiation Oncologist
- Radiation Oncology nurse
- Physicist/dosimetrist
- Other: Please specify: \_\_\_\_\_

What, if any, patient training is provided before the assessment?

Who provides the training?

- Radiation Therapist (or simulator technologist)
- Radiation Oncologist
- Radiation Oncology nurse
- Physicist/dosimetrist
- Other: Please specify: \_\_\_\_\_

#### **IV. Specifics of the Management of Motion due to Respiratory Motion**

***Please answer the section(s) below that are applicable to your institution***

- A. If after measuring the motion you do nothing other than increase margins for PTV definition

Who determines the margin to be added to account for the motion? \_\_\_\_\_

Are these margins assessed in 3 dimensions?

Yes     Usually     No

Are the margins the same in all directions?

Yes     Usually     No

- B. If you use forced shallow breathing using abdominal compression

Describe the system you use for abdominal compression:

What pressure do you usually apply? \_\_\_\_\_ lbs/sq inch

What is the sensor used to monitor the pressure? \_\_\_\_\_

Please attach your written procedures for the use and quality assurance of this device.

**C. If you use active breathing control (ABC):**

Do you use a commercially available system? \_\_\_\_\_ Yes \_\_\_\_\_ No

If yes, which one? \_\_\_\_\_

For your device, how is a breathing trace acquired?

\_\_\_\_\_ Mechanical spirometer

\_\_\_\_\_ Temperature sensor

\_\_\_\_\_ Other. Please specify: \_\_\_\_\_

How frequently is the calibration of airflow performed?

How frequently is the calibration of volume performed?

How frequently are emergency procedures reviewed?

Please attach your written procedures for the use and quality assurance of this device.

**D. If you use self-held breath-hold with respiratory monitoring:**

(e.g., Varian RPM system)

Prior to simulation, how are patients evaluated for their ability to comply?

What aids do you use to help compliance?

(e.g. audio commands (from tapes), visual guides)

Are the thresholds used for beam off the same for all patients?

\_\_\_\_\_ Yes \_\_\_\_\_ No

Please attach your written procedures for the use and quality assurance of this device.

E. If you use gating during free breathing with external monitors or implanted fiducials

If you use a commercial system, which one is it?

Do you use

\_\_\_\_\_ External monitors (eg, Varian RPM system)?

\_\_\_\_\_ Implanted fiducials?

How is the planning CT acquired?

\_\_\_\_\_ Gated CT scan

\_\_\_\_\_ 4D CT scan

Is the gating

\_\_\_\_\_ Amplitude based?

\_\_\_\_\_ Phase based?

*Please attach your written procedures for the use and quality assurance of this device.*

F. If you track the motion of the target during treatment

What commercial system do you use?

What do you track?

\_\_\_\_\_ Fiducial markers?

\_\_\_\_\_ Anatomic correlates (e.g. diaphragm, chest wall)

\_\_\_\_\_ Other. Please describe:

*Please attach your written procedures for the use and quality assurance of this device.*

**V: Data to be submitted with completed questionnaire:**

- A. Copy of your written procedures for assessing the target motion due to respiratory motion for individual patients, including quality assurance procedures for all equipment.
  
- B. Copy of your written procedures for each motion management technique used for treating patients, including quality assurance procedures for all equipment.