



## Motion Management Questionnaire

IROC Rhode Island QA Center  
Quality Assurance Review Center  
Building B, Suite 201  
640 George Washington Highway  
Lincoln, RI 02865-4207  
Phone (401) 753-7600  
Fax: (401) 753-7601  
[www.irocqi.qarc.org](http://www.irocqi.qarc.org)

IROC Houston QA Center  
M.D. Anderson Cancer Center  
8060 EL Rio Street  
Houston, TX 77054  
Phone (713) 745-8989  
Fax: (713) 794-1364  
[irochouston.mdanderson.org](http://irochouston.mdanderson.org)

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: \_\_\_\_\_

RTF# \_\_\_\_\_

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

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

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

Email: \_\_\_\_\_

### 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? \_\_\_\_\_MV

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? \_\_\_\_\_

**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?

\_\_\_\_\_

**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

**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?

**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 save and submit to IROC RI QA Center via sFTP.**

**Or**