

Data Collection Worksheet

Please Note: The Data Collection Worksheet (DCW) is a tool to aid investigators to integrate the collection of PhenX measures in your study. The PhenX measures that you selected and added to your Cart are presented in the DCW in alphabetical order. The DCW includes worksheets for data collection. Variables derived from the collected data are shown in the Data Dictionary (DD) with variable names and unique PhenX variable identifiers. The collection of DCWs produced by the Toolkit is not designed as a data collection instrument. Each investigator will decide how to integrate PhenX measures into data collection for their study.

A. Subject Preparation for CT Scan

1. Prior to the study, the subject's identity will be confirmed according to institutional policy.
2. The subject will remove all metallic devices from the chest area.
3. The subject will be informed of the importance of compliance with the breathing instructions. Ability to comply with instructions should be assessed, and conditions that might impair compliance such as deafness, breathlessness, or mental impairment should be noted.
4. At least one rehearsal of the end-inspiratory breath-hold should be performed.

B. CT Acquisition

All CT scans will be obtained using the protocol and breathing instructions as indicated. Scans must be reconstructed using two algorithms, edge enhancing and smooth. Contiguous end-expiratory CT images will also be obtained where possible.

Instructions for CT Scan Acquisition

GENERAL: This study consists of two scouts (topograms) and two scans. All scans use the same parameter grid.

CONTRAST: Oral/IV. None.

SUPINE INSPIRATION: Start at bottom of lungs, end at top of lungs. Instruct the patient to breathe as follows:

"For the first part of this study you will be asked to hold your breath for about 20 seconds. If you cannot hold your breath that long, try the best you can and then take very shallow, slow breaths if you need to."

"For now, take several easy, deep breaths and relax while we prepare to take a CT scan of your lungs."

Allow patient to breathe and relax for at least 15 seconds.

"I am now going to give you specific breathing instructions. Try to follow as best you can."

"Take in a deep breath....and let it out."

"Take in another deep breath....and let it out."

"Take in another deep breath, and hold your breath in. Keep holding your breath!"

Scan the patient in one breath-hold at full-inspiration.

When the scan is completed, tell the study participant to "Breathe and relax!"

SUPINE EXPIRATION: Same protocol as SUPINE INSPIRATION. Start at bottom of lungs, end at top of lungs. Instruct the patient to breathe as follows:

"For the second part of this study you will be asked to blow out your breath and hold it out for about 20 seconds. This is usually more difficult than holding your breath in, but do the best that you can. If you cannot hold your breath out that long, take a very slow shallow breath in if you need to."

"For now, take several easy, deep breaths and relax while we prepare to take the last CT scan of your lungs."

Allow patient to breathe and relax for at least 15 seconds.

"I am now going to give you more specific breathing instructions. Try to follow as best you can."

"

"Take in a deep breath....and let it out."

"Take in another deep breath....and let it out."

"Take in another deep breath, let it out, and hold your breath out! Do not breathe!"

Scan the patient in one breath-hold at expiration as quickly as possible.

When the scan is completed, tell the study participant to "Breathe and relax!"

(b) Inspiratory CT

| Scanner make | GE | GE | SIEMENS | SIEMENS | PHILIPS | PHILIPS | PHILIPS |
|-----------------------|-------------|------------|--------------------|--------------------|-------------|-------------|-------------|
| Scanner model | LS 35 | VCT-64 | Sensation-35 | Sensation-64 | 36 slice | 40 slice | 64 slice |
| Scan Type | Radial | VCT Radial | Spiral | Spiral | Axial Helix | Axial Helix | Axial Helix |
| Rotation Time (s) | See msk | See msk | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Def. Configuration | 36x0.625 | 64x0.625 | 36x0.75 | 64x0.6 | 36x0.75 | 40x0.625 | 64x0.625 |
| Pitch | 1.375 | 1.375 mm | 1.1 | 1.1 | 1.388 | 0.929 | 0.929 |
| Speed (mm/rot) | 13.75 | 13.75 | 13.2 | 21.1 | 0.5 | 0.5 | 0.5 |
| XFO | 130 | 130 | 130 | 130 | 130 | 130 | 130 |
| mA | 400 @ 0.5s | 400 @ 0.5s | Effective mAs: 400 | Effective mAs: 400 | mAs 200 | mAs 200 | mAs 200 |
| Door modulation | Auto-mk off | Off | CAIR | CAIR | Off | Off | Off |
| | | | Door 40 off | Door 40 off | | | |
| Reconstruction | | | | | | | |
| RECON1 | | | | | | | |
| Algorithm | BONE | BONE | B4f | B4f | Detail (3) | Detail (3) | Detail (2) |
| Thickness (mm) | 0.625 | 0.625 | 0.75 | 0.75 | 0.9 | 0.9 | 0.9 |
| Interval (mm) | 0.625 | 0.625 | 0.5 | 0.5 | 0.45 | 0.45 | 0.45 |
| DRVV (cm) | Lung* | Lung* | Lung* | Lung* | Lung* | Lung* | Lung* |
| RECON 2 | | | | | | | |
| Algorithm | Standard | Standard | B3f | B3f | 8 | 8 | 8 |
| Thickness (mm) | 0.625 | 0.625 | 0.75 | 0.75 | 0.9 | 0.9 | 0.9 |
| Interval (mm) | 0.625 | 0.625 | 0.5 | 0.5 | 0.45 | 0.45 | 0.45 |
| DRVV (cm) | Lung* | Lung* | Lung* | Lung* | Lung* | Lung* | Lung* |

*reconstruction field of view should encompass the widest diameter of the lung.

Inspiratory CT

(c) Expiratory CT

| Scanner make | GE | GE | SIEMENS | SIEMENS | PHILIPS | PHILIPS | PHILIPS |
|-----------------------|-------------|------------|--------------------|--------------------|-------------|-------------|-------------|
| Scanner model | LS 35 | VCT-64 | Sensation-35 | Sensation-64 | 36 slice | 40 slice | 64 slice |
| Scan Type | Radial | VCT Radial | Spiral | Spiral | Axial Helix | Axial Helix | Axial Helix |
| Rotation Time (s) | See msk | See msk | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Def. Configuration | 36x0.625 | 64x0.625 | 36x0.75 | 64x0.6 | 36x0.75 | 40x0.625 | 64x0.625 |
| Pitch | 1.375 | 1.375 mm | 1.1 | 1.1 | 1.388 | 0.929 | 0.929 |
| Speed (mm/rot) | 13.75 | 13.75 | 13.2 | 21.1 | 0.5 | 0.5 | 0.5 |
| XFO | 130 | 130 | 130 | 130 | 130 | 130 | 130 |
| MA | 300 @ 0.5s | 300 @ 0.5s | Effective mAs: 300 | Effective mAs: 300 | 50 mAs | 50 mAs | 50 mAs |
| Door modulation | Auto-mk off | Off | CAIR | CAIR | Off | Off | Off |
| | | | Door 40 off | Door 40 off | | | |
| Reconstruction | | | | | | | |
| RECON1 | | | | | | | |
| Algorithm | BONE | BONE | B4f | B4f | Detail (3) | Detail (3) | Detail (2) |
| Thickness (mm) | 0.625 | 0.625 | 0.75 | 0.75 | 0.9 | 0.9 | 0.9 |
| Interval (mm) | 0.625 | 0.625 | 0.5 | 0.5 | 0.45 | 0.45 | 0.45 |
| DRVV (cm) | Lung* | Lung* | Lung* | Lung* | Lung* | Lung* | Lung* |
| RECON 2 | | | | | | | |
| Algorithm | Standard | Standard | B3f | B3f | 8 | 8 | 8 |
| Thickness (mm) | 0.625 | 0.625 | 0.75 | 0.75 | 0.9 | 0.9 | 0.9 |
| Interval (mm) | 0.625 | 0.625 | 0.5 | 0.5 | 0.45 | 0.45 | 0.45 |
| DRVV (cm) | Lung* | Lung* | Lung* | Lung* | Lung* | Lung* | Lung* |

*reconstruction field of view should encompass the widest diameter of the lung.

Expiratory CT

Conditions that might affect ability to comply with breathing instructions _____

Supine Inspiratory CT Image ID _____

Supine Expiratory CT Image ID _____

Protocol source: <https://www.phenxtoolkit.org/protocols/view/90401#Source>