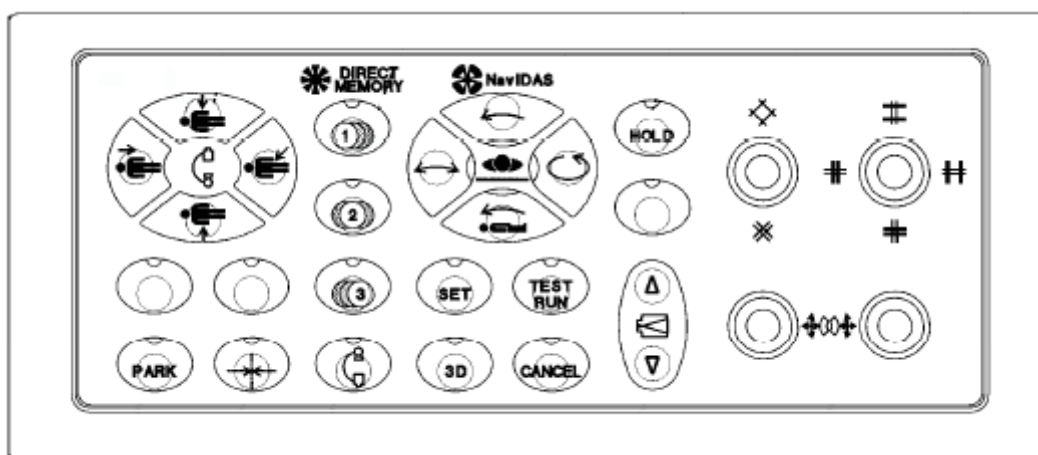


SCORE 3D Operation Guide [Head]

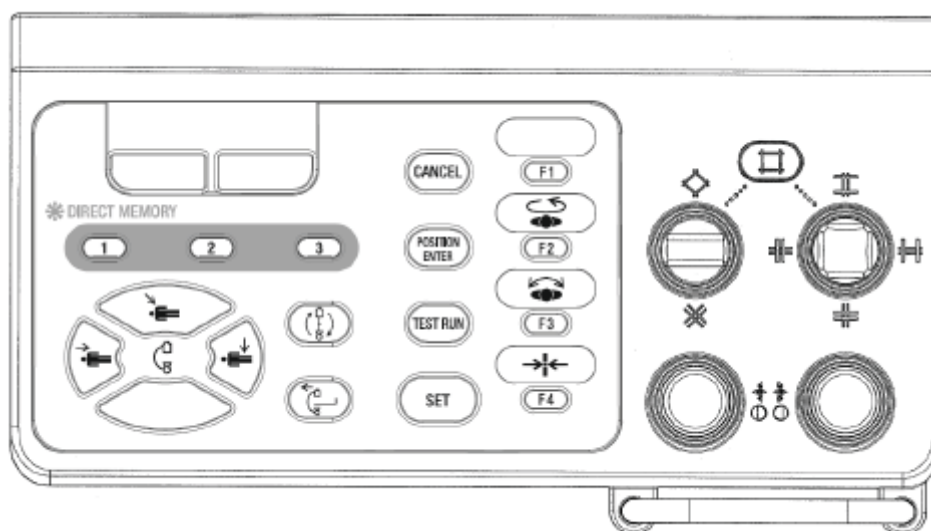
Attention:

Please use a paper properly by a console type. (Type A / Type B)

Console Type A:



Console Type B:



SCORE 3D Operation Guide [Head]

Target System: Trinias (Console Type A)

1 Select DUP as “SCORE-3D-DSA” on Ref monitor.

*If you select “SCORE-3D-DA”, skip 9 and 10.

2 Set the C-arm to **HEAD** position and return it to **CENTER** position pressing switch.

*If it is the floor mounted type (MH-300), correct image may not be acquired if move the C-arm in body axis direction (tabletop in longitudinal direction). In this case, rotate the C-arm to Park position once and press Center position switch to return it to correct position.



3 Fasten patient's head tightly.

If the patient's body moves during 3D angiography, the reconstructed image suffers artifact and does not show the region with the required clarity. Body movement should be suppressed during the acquisition process.



4 Open all the leaves of the collimator **fully**.

*You can only use C-leaves to reduce direct X-ray.

5 Position the head to the center of FOV using table top floating. (**Minimize direct X-ray**)

6 Use the DIRECT MEMORY to set the C-arm to Lateral position and adjust table height only.

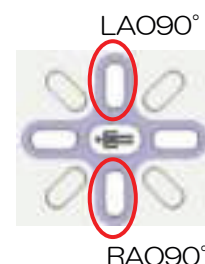
(Set LAO 90 degree for MH-200s, RAO 90 degree for MH-300)

***Be sure to keep patient's safety during acquisition.**

Frontal



Lateral



- 7 Press "3D" switch and "SET" switch will blink.
Set the C-arm to start position pressing "SET" switch.**

We recommend you to check fluoroscopy image to confirm the targeted region is still in the field of view during C-arm movement.



After positioning the C-arm, the following message will be displayed in the upper part on ACQ-monitor.

"Start Acquisition"

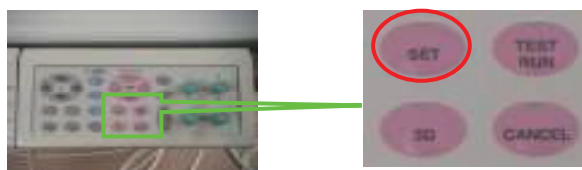
- 8 Set up the injector with the contrast medium is filled up to the front edge of catheter.**
Injector won't work during MASK acquisition usually.

- 9 Acquire MASK image**

Direct the patient not to move during MASK Acquisition.

In case of 3D-DSA, explain that there are **two acquisitions**, please tell him or her **not to move the head during the meantime**.

- 10 SET the C-arm to start position again pressing "SET" switch.**



After positioning the C-arm, the following message will be displayed in the upper part on ACQ monitor. **"Start Acquisition"**

- 11 Acquire LIVE image**

Set up proper Inj-ACQ delay time according conditions of patient or targeted region using side menu of Ref-monitor.

The acquisition is completed.

Injector Conditions

*Please find I-A delay from a DSA image.
The time is until a target blood vessel is full of contrast media.

Vessel	C-arm speed (deg/sec)	Rad Time (sec)	Inj-Acq Delay (sec)	Injector Configuration				
				Delay (sec)	Rate (ml/sec)	Injection time (sec)	Total (ml)	Rise Fall (sec)
Internal carotid a.(ICA) Anterior cerebral a.(ACA) Middle cerebral a.(MCA) In case the edge of catheter is located to ICA	60	3.3	2.5	0	3~5	5.0	12~20	0.4
Internal carotid a.(ICA) Anterior cerebral a.(ACA) Middle cerebral a.(MCA) In case the edge of catheter is located to CC	60	3.3	3	0	4~6	5.5	16~24	0.4
Vertebral a.(VA) Basilar a.(BA)	60	3.3	2.5	0	3~5	5.0	12~20	0.4
Cervical Carotid a. (Origin of ICA) In case the edge of catheter is located to CC	60	3.3	0.5	0	4~6	3.5	18~27	0.4

- We recommend using undiluted contrast medium.
- On SCORE 3D, the cerebral artery needs to be filled with the contrast medium. Before the acquisition, fill the contrast medium to the catheter front edge.
- Make fine adjustment of contrast medium according to region or/and condition of the disease.

Injection Time: Inj-Acq Delay + Rad Time / Rate: setting same as DSA

Acquisition Conditions

DUP	SCORE-3D-DA	SCORE-3D-DSA
Acq. rate	30fps (Fixed)	
Exposure time	3.3sec (Fixed)	
Injector control	ON (Fixed)	
Inj-Acq delay	2.5sec	
Mask-Acq delay	0sec	

Make fine adjustment of Inj-Acq delay according to region or/and condition of the disease.

SCORE 3D Operation Guide [Head]

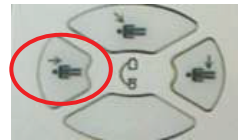
Target System: Trinias (Console Type B)

1 Select DUP as “SCORE-3D-DSA” on Ref monitor.

*If you select “SCORE-3D-DA”, skip 9 and 10.

2 Set the C-arm to **HEAD** position and return it to **CENTER** position pressing switch.

*If it is the floor mounted type t (MH-300), correct image may not be acquired if move the C-arm in body axis direction (tabletop in longitudinal direction). In this case, move the C-arm to Park position once and press Center position switch to return it to correct position.



3 Fasten patient's head tightly.

If the patient's body moves during 3D angiography, the reconstructed image suffers artifact and does not show the region with the required clarity. Body movement should be suppressed during the acquisition process.



4 Open all the leaves of the collimator **fully**.

*You can only use C-leaves to reduce direct X-ray.

5 Position the head to the center of FOV using table top floating. (**Minimize direct X-ray**)

6 Use the DIRECT MEMORY to set the C-arm to Lateral position and adjust table height only.

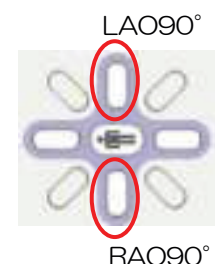
(Set LAO 90 degree for MH-200s, RAO 90 degree for MH-300)

***Be sure to keep patient's safety during acquisition.**

Frontal

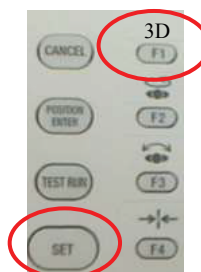
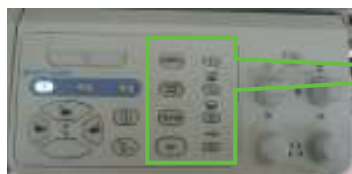


Lateral



- 7 Press "3D" switch and "SET" switch will blink.
Set C-arm to start position pressing "SET" switch.**

We recommend you to check fluoroscopy image to confirm the targeted region is still in the field of view during C-arm movement.



After positioning the C-arm, the following message will be displayed in the upper part on ACQ-monitor.

"Start Acquisition"

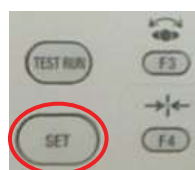
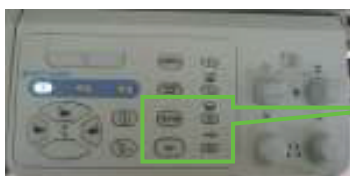
- 8 Set up the injector with the contrast medium is filled up to the front edge of catheter.**
Injector won't work during MASK acquisition usually.

- 9 Acquire MASK image**

Direct the patient not to move during MASK Acquisition.

In case of 3D-DSA, explain that there are **two acquisitions**, please tell him or her **not to move the head during the meantime**.

- 10 SET the C-arm to start position again pressing "SET" switch.**



After positioning the C-arm, the following message will be displayed in the upper part on ACQ monitor. **"Start Acquisition"**

- 11 Acquire LIVE image**

Set up proper Inj-ACQ delay time according conditions of patient or targeted region using side menu of Ref-monitor.

The acquisition is completed.

Injector Conditions

*Please find I-A delay from a DSA image.
The time is until a target blood vessel is full of contrast media.

Vessel	C-arm speed (deg/sec)	Rad Time (sec)	Inj-Acq Delay (sec)	Injector Configuration				
				Delay (sec)	Rate (ml/sec)	Injection time (sec)	Total (ml)	Rise Fall (sec)
Internal carotid a.(ICA) Anterior cerebral a.(ACA) Middle cerebral a.(MCA) In case the edge of catheter is located to ICA	60	3.3	2.5	0	3~5	5.0	12~20	0.4
Internal carotid a.(ICA) Anterior cerebral a.(ACA) Middle cerebral a.(MCA) In case the edge of catheter is located to CC	60	3.3	3	0	4~6	5.5	16~24	0.4
Vertebral a.(VA) Basilar a.(BA)	60	3.3	2.5	0	3~5	5.0	12~20	0.4
Cervical Carotid a. (Origin of ICA) In case the edge of catheter is located to CC	60	3.3	0.5	0	4~6	3.5	18~27	0.4

- We recommend using undiluted contrast medium.
- On SCORE 3D, the cerebral artery needs to be filled with the contrast medium. Before the acquisition, fill the contrast medium to the catheter front edge.
- Make fine adjustment of contrast medium according to region or/and condition of the disease.

Injection Time: Inj-Acq Delay + Rad Time / Rate: setting same as DSA

Acquisition Conditions


DUP	SCORE-3D-DA	SCORE-3D-DSA
Acq. rate	30fps (Fixed)	
Exposure time	3.3sec (Fixed)	
Injector control	ON (Fixed)	
Inj-Acq delay	2.5sec	
Mask-Acq delay	0sec	

Make fine adjustment of Inj-Acq delay according to region or/and condition of the disease.

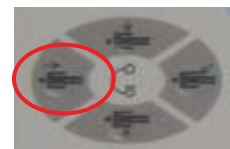
SCORE 3D Operation Guide [Abdomen]

Target System: Trinias (Console Type A)

1 Select DUP as “SCORE-3D-DA” on Ref monitor.

2 Set the C-arm to **HEAD** position and return it to **CENTER** position pressing  switch.

*If it is the floor mounted type (MH-300), correct image may not be acquired if move the C-arm in body axis direction (tabletop in longitudinal direction). In this case, move the C-arm to Park position once and press Center position switch to return it to correct position.



3 Open all the leaves of the collimator **fully**.

4 Position the abdomen to the center of FOV using table top floating.

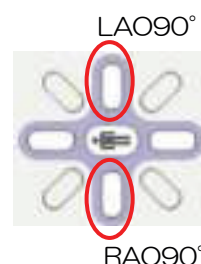
*It is important to set the target region on the iso-center, however, in the abdomen, it is not always possible to position as you want because C-arm and patients might have contact each other. For SCORE 3D, set ROI to the center of the FPD field of view is more important than setting the region of interest to the iso-center.

*Make the patient to elevate the arms or cross his/her arms in front of the chest to prevent to captured a the arms.

5 Use the **DIRECT MEMORY** to set the C-arm to Lateral position and adjust table height only.

(Set LAO 90 degree for MH-200s, RAO 90 degree for MH-300)

*Be sure to keep patient's safety during acquisition.



- 6 Press "3D" switch and "SET" switch will blink.
Set the C-arm to start position pressing "SET" switch.**

We recommend you to check fluoroscopy image to confirm the targeted region is still in the field of view during C-arm movement.



After positioning the C-arm, the following message will be displayed in the upper part on ACQ-monitor.
"Start Acquisition"

- 7 Set up the injector with the contrast medium is filled up to the front edge of catheter.**

- 8 Make the patient to hold his/her breath and acquire LIVE image.**

The acquisition is completed.

*Just Turn: This function controls the starting timing of C-arm rotation while confirming the flow of contrast medium by the Breath-Holding MAP.

Injector Conditions

*Please find I-A delay from a DSA image.
The time is until a target blood vessel is full of contrast media.

Vessel	C-arm speed (deg/sec)	Rad Time (sec)	Inj-Acq Delay (sec)	Injector Configuration				
				Delay (sec)	Rate (ml/sec)	Injection time (sec)	Total (ml)	Rise Fall (sec)
Common hepatic a.	60	3.3	2	0	3~4	5.0	12~16	0.4
Portal vein	60	3.3	15	0	8	6.0	48	0.4
Renal a.	60	3.3	0.5	0	4	3.5	16	0.4

- We recommend using undiluted contrast medium.
- On 3D-ANGIO system, the targetl artery needs to be filled with the contrast medium. Before the acquisition, fill the contrast medium to the catheter front edge.
- Make fine adjustment of contrast medium according to region or/and condition of the disease.
- We recommend selective injection depends on targeted vessel.

Injection Time: Inj-Acq Delay + Rad Time (Excluding Portal)

Rate: setting same as DSA

Acquisition Conditions

DUP	SCORE 3D-DA
Acq. rate	30fps (Fixed)
Exposure time	3.3sec (Fixed)
Injector control	ON (Fixed)
Inj-Acq delay	0sec
Mask-Acq delay	0sec


Make fine adjustment of Inj-Acq delay according to region or/and condition of the disease.

Inj-Acq delay of "3D-DSA-Portal" is based using "Just Turn" function.

SCORE 3D Operation Guide [Abdomen]

Target System: Trinias (Console Type B)

1 Select DUP as “SCORE-3D-DA” on Ref monitor.

2 Set the C-arm to **HEAD position and return it to **CENTER** position pressing  switch.**

*If it is the floor mounted type (MH-300), correct image may not be acquired if move the C-arm in body axis direction (tabletop in longitudinal direction). In this case, move the C-arm to Park position once and press Center position switch to return it to correct position.



3 Open all the leaves of the collimator **fully.**

4 Position the abdomen to the center of FOV using table top floating.

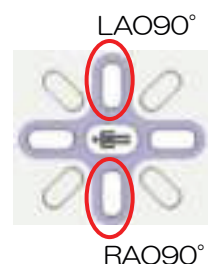
*It is important to set the target region on the iso-center, however, in the abdomen, it is not always possible to position as you want because C-arm and patients might have contact each other. For SCORE 3D, set ROI to the center of the FPD field of view is more important than setting the region of interest to the iso-center.

*Make the patient to elevate the arms or cross his/her arms in front of the chest to prevent to captured a the arms.

5 Use the DIRECT MEMORY to set the C-arm to Lateral position and adjust table height only.

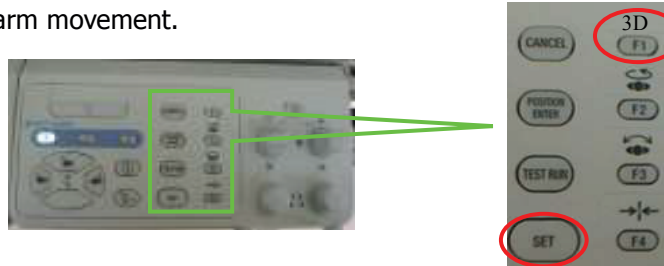
(Set LAO 90 degree for MH-200s, RAO 90 degree for MH-300)

*Be sure to keep patient's safety during acquisition.



- 6 Press "3D" switch and "SET" switch will blink.
Set the C-arm to start position pressing "SET" switch.**

We recommend you to check fluoroscopy image to confirm the targeted region is still in the field of view during C-arm movement.



After positioning the C-arm, the following message will be displayed in the upper part on ACQ-monitor.
"Start Acquisition"

- 7 Set up the injector with the contrast medium is filled up to the front edge of catheter.**

- 8 Make the patient to hold his/her breath and acquire LIVE image.**

The acquisition is completed.

*Just Turn: This function controls the starting timing of C-arm rotation while confirming the flow of contrast medium by the Breath-Holding MAP.

Injector Conditions

*Please find I-A delay from a DSA image.
The time is until a target blood vessel is full of contrast media.

Vessel	C-arm speed (deg/sec)	Rad Time (sec)	Inj-Acq Delay (sec)	Injector Configuration				
				Delay (sec)	Rate (ml/sec)	Injection time (sec)	Total (ml)	Rise Fall (sec)
Common hepatic a.	60	3.3	2	0	3~4	5.0	12~16	0.4
Portal vein	60	3.3	15	0	8	6.0	48	0.4
Renal a.	60	3.3	0.5	0	4	3.5	16	0.4

- We recommend using undiluted contrast medium.
- On 3D-ANGIO system, the target artery needs to be filled with the contrast medium. Before the acquisition, fill the contrast medium to the catheter front edge.
- Make fine adjustment of contrast medium according to region or/and condition of the disease.
- We recommend selective injection depends on targeted vessel.

Injection Time: Inj-Acq Delay + Rad Time (Excluding Portal)

Rate: setting same as DSA

Acquisition Conditions

DUP	SCORE 3D-DA
Acq. rate	30fps (Fixed)
Exposure time	3.3sec (Fixed)
Injector control	ON (Fixed)
Inj-Acq delay	0sec
Mask-Acq delay	0sec

Make fine adjustment of Inj-Acq delay according to region or/and condition of the disease.

Inj-Acq delay of "3D-DSA-Portal" is based using "Just Turn" function.

SCORE CT Imaging (Option)

Purpose

To provide real time 3D clinical data, that helps diagnosis or treatment, without moving patients during IVR.

Features

Compared with SCORE 3D which is mainly used for angiography, SCORE CT imaging, that has an advantage on low contrast resolution, can visualize light tumor stain.

Application

1. Identify the feeding artery to the tumor
2. Assess the effect of treatment

SCORE CT vs CT

<Advantage>

- High contrast resolution
- Isotropic 3D image with high spatial resolution
Remarks : Depends on acquisition modes
- No need to move patient to another room during IVR

<Disadvantages>

- Relatively poor in low contrast resolution
It is because of dynamic range, number of acquisition, or scatters
- Not very accurate CT number
Scatter can not be removed properly

Acquisition procedure

Rotate C-arm and acquire injecting contrast media from the catheter in the artery. C-arm rotates at 20 deg/sec. Axial image or coronal image are displayed on 3D-WS monitor. Lesion can be observed from various sections.

Half or one-third amount of contrast media used for DSA is recommended for SCORE CT.

SCORE CT Imaging Operation Guide

Target System: Trinias (Console Type A)

1 Select DUP as “SCORE CT” on Ref monitor

2 Set the C-arm to **HEAD** position and return it to **CENTER** position pressing switch.

3 Open all the leaves of the collimator **fully**.

You can only use V-leaf to reduce X-ray dose.

4 Position the abdomen to the center of FOV using table top floating

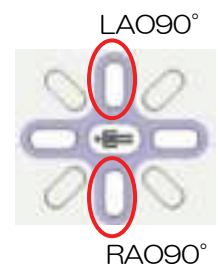
*It is important to set the target region on the iso-center, however, in the abdomen, it is not always possible to position as you want because C-arm and patients might have contact each other. For SCORE CT, set ROI th the center of the FPD field of view is more important than setting the region of interest to the iso-center.

*Make the patient to elevate to arms of cross his/her arms in front of the chest to prevent to captured the arms.

5 Use the **DIRECT MEMORY** to set the C-arm to **Lateral** position and adjust table height only.

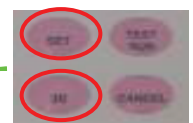
(Set LAO 90 degree for MH-200s, RAO 90 degree for MH-300)

*Be sure to keep patient safety during acquisition.



6 Press “3D” switch and “SET” switch sill blink. Set the C-arm to start position pressing “SET” switch.

We recommend you to check fluoroscopy image to confirm the targeted region is still in the field of view during C-arm movement.



After positioning the C-arm, the following message will be displayed in the upper part on ACQ monitor.

“Start acquisition”

- 7** Set up the injector with the contrast medium is filled up to the front edge of catheter.

- 8** Make the patient to hold his/her breath and acquire image

*Set up proper Inj-ACQ delay time depends on conditions of patient or targeted region using side menu of Ref-monitor.

*Be sure to keep mind a safety of the patient.

The acquisition is completed.

Injector Conditions

*Please find I-A delay from a DSA image.
The time is until a target blood vessel is full of contrast media.

Vessel	C-arm speed (deg/sec)	Rad Time (sec)	Inj-Acq Delay (sec)	Injector Configuration				
				Delay (sec)	Rate (ml/sec)	Injection time (sec)	Total (ml)	Rise Fall (sec)
CTAP (CT during Arterial Portography)	20	10	25.0	0	5.0	15	75	0.8
CTA/CTHA (CT during Hepatic Arteriography)	20	10	8.0	0	2.0	18	36	0.8

- On SCORE CT imaging, the artery needs to be filled with the contrast medium. Before the acquisition, fill the contrast medium to the catheter front edge.
- The injection quantity is a standard measure. Select an appropriate injection quantity depends on injected parts or cased.
- On SCORE CT imaging, using the undiluted contrast medium causes the artifact. Make sure to dilute it by twice or triple when using.

Acquisition Conditions

DUP	SCORE CT
Acq. rate	30fps (Fixed)
Acq. mode	SCORE CT (Fixed)
Exposure time	10sec (Fixed)
Injector control	ON (Fixed)
Inj-Acq Delay	0sec
Mask-Acq Delay	0sec

Make fine adjustment of Inj-Acq delay depends on region or/and condition of the disease.

SCORE CT Imaging (Option)

Purpose

To provide real time 3D clinical data, that helps diagnosis or treatment, without moving patients during IVR.

Features

Compared with SCORE 3D which is mainly used for angiography, SCORE CT imaging, that has an advantage on low contrast resolution, can visualize light tumor stain.

Application

1. Identify the feeding artery to the tumor
2. Assess the effect of treatment

SCORE CT vs CT

<Advantage>

- High contrast resolution
- Isotropic 3D image with high spatial resolution
Remarks : Depends on acquisition modes
- No need to move patient to another room during IVR

<Disadvantages>

- Relatively poor in low contrast resolution
It is because of dynamic range, number of acquisition, or scatters
- Not very accurate CT number
Scatter can not be removed properly

Acquisition procedure

Rotate C-arm and acquire injecting contrast media from the catheter in the artery. C-arm rotates at 20 deg/sec. Axial image or coronal image are displayed on 3D-WS monitor. Lesion can be observed from various sections.

Half or one-third amount of contrast media used for DSA is recommended for SCORE CT.

SCORE CT Imaging Operation Guide

Target System: Trinias (Console Type B)

1 Select DUP as “SCORE CT” on Ref monitor

2 Set the C-arm to **HEAD** position and return it to **CENTER** position pressing switch.

3 Open all the leaves of the collimator **fully**.

You can only use V-leaf to reduce X-ray dose.

4 Position the abdomen to the center of FOV using table top floating

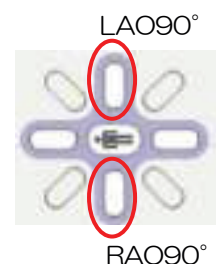
*It is important to set the target region on the iso-center, however, in the abdomen, it is not always possible to position as you want because C-arm and patients might have contact each other. For SCORE CT, set ROI th the center of the FPD field of view is more important than setting the region of interest to the iso-center.

*Make the patient to elevate to arms of cross his/her arms in front of the chest to prevent to captured the arms.

5 Use the **DIRECT MEMORY** to set the C-arm to Lateral position and adjust table height only.

(Set LAO 90 degree for MH-200s, RAO 90 degree for MH-300)

*Be sure to keep patient safety during acquisition.

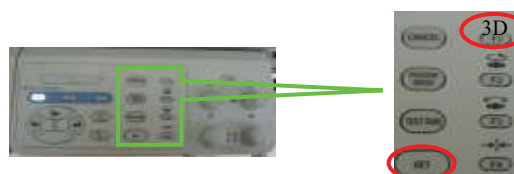


6 Press “3D” switch and “SET” switch sill blink. Set the C-arm to start position pressing “SET” switch.

We recommend you to check fluoroscopy image to confirm the targeted region is still in the field of view during C-arm movement.

After positioning the C-arm, the following message will be displayed in the upper part on ACQ monitor.

“Start acquisition”



7 Set up the injector with the contrast medium is filled up to the front edge of catheter.

8 Make the patient to hold his/her breath and acquire image

*Set up proper Inj-ACQ delay time depends on conditions of patient or targeted region using side menu of Ref-monitor.

*Be sure to keep mind a safety of the patient.

The acquisition is completed.

Injector Conditions

*Please find I-A delay from a DSA image.
The time is until a target blood vessel is full of contrast media.

Vessel	C-arm speed (deg/sec)	Rad Time (sec)	Inj-Acq Delay (sec)	Injector Configuration				
				Delay (sec)	Rate (ml/sec)	Injection time (sec)	Total (ml)	Rise Fall (sec)
CTAP (CT during Arterial Portography)	20	10	25.0	0	5.0	15	75	0.8
CTA/CTHA (CT during Hepatic Arteriography)	20	10	8.0	0	2.0	18	36	0.8

- On SCORE CT imaging, the artery needs to be filled with the contrast medium. Before the acquisition, fill the contrast medium to the catheter front edge.
- The injection quantity is a standard measure. Select an appropriate injection quantity depends on injected parts or cased.
- On SCORE CT imaging, using the undiluted contrast medium causes the artifact. Make sure to dilute it by twice or triple when using.

Acquisition Conditions

DUP	SCORE CT
Acq. rate	30fps (Fixed)
Acq. mode	SCORE CT (Fixed)
Exposure time	10sec (Fixed)
Injector control	ON (Fixed)
Inj-Acq Delay	0sec
Mask-Acq Delay	0sec

Make fine adjustment of Inj-Acq delay depends on region or/and condition of the disease.