Functional versus Culprit-only Revascularization in Elderly Patients with Myocardial Infarction and Multivessel Disease: the FIRE Trial

Quantitative Flow Ratio (QFR)
Angiographic Projections
Tips and Tricks

➢ **Two standard projections at 15 fps with at least 25 degree angulation**

➢ Inject I.C. nitro-glycerine as early as possible

➢ Make sure that the catheter is filled with contrast before the injection (i.e. after administration of nitro-glycerine)

➢ Use brisk, continuous and fast contrast injections. Aim for full 3 cardiac cycles

➢ **Minimize overlap of target segments**

➢ **Avoid foreshortening of the vessel**

➢ Avoid zooming

➢ Avoid moving the table early after injection

➢ Make sure that the entire vessel is visible in both projections.
## Angiographic Projections

Suggested projection angles for specific lesion segments

<table>
<thead>
<tr>
<th>Vessel/Bifurcation</th>
<th>1° view</th>
<th>2° view</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM + LAD/LCX</td>
<td>RAO 20, CAU 45</td>
<td>AP, CAU 10</td>
</tr>
<tr>
<td>LAD/Diag</td>
<td>AP, CRA 45</td>
<td>RAO 30, CRA 20</td>
</tr>
<tr>
<td>LCX/OM</td>
<td>LAO 10, CAU 25</td>
<td>RAO 25, CAU 35</td>
</tr>
<tr>
<td>RCA</td>
<td>LAO 45, CAU 10</td>
<td>LAO 20, CRA 20</td>
</tr>
</tbody>
</table>
QFR Computation (1)

- Choose the first projection of the target vessel
- Click the right button
- Select QAngio XA 3D
- Select the second projection of the target vessel (yellow line should be orthogonal to the lesion)
- Stop both runs at the end-diastolic frame (when the vessel is filled with contrast)
QFR Computation (3)

Select this item to proceed with analysis
QFR Computation (5)

Indicate two checkpoints on target vessel (usually where a sidebranch originates) ...
Indicate two checkpoints on target vessel (usually where a sidebranch originates) ... and then click the Next button
QFR Computation (6)

- Select a proximal and a distal landmark on target vessel ...
- Select a proximal and a distal landmark on target vessel ...
- Click “Lock pathlines” to make any necessary corrections of the contours ...
- Select a proximal and a distal landmark on target vessel ...
- Click “Lock pathlines” to make any necessary corrections of the contours ...
- Proceed with the Next button.
QFR Computation (7)

Check the result of the analysis based on the curves in the lower right box.

For a good result the blue and the yellow curve should be overlapped.
At this point you have to select the “Check Reference”.

**Usually it is correct to maintain what the software computes automatically (“Auto”).**

Sometimes it is necessary to select “Normals” to indicate the segments of the vessel which are healthy.

“Fixed prox” is necessary only when the disease involved also the ostial part of the vessel.
QFR Computation (9)

It is mandatory to select YES
QFR Computation (9)

Select the target vessel ...
QFR Computation (9)

Select the target vessel ...
and so you obtain the Vessel QFR “Fixed Flow”.

![QFR Computation Image]
For a more accurate result, you have to perform the frame counting.
QFR Computation (10)

1) Select “Frame counting”
1) Select “Frame counting”
2) Choose the projection (left or right) in which you want to perform the frame counting
QFR Computation (10)

1) Select “Frame counting”
2) Choose the projection (left or right) in which you want to perform the frame counting
3) Select the frame in which contrast arrives at the proximal landmark (“Start frame”) and the frame in which contrast reaches the distal landmark on target vessel (“End frame”)
QFR Computation (10)

1) Select “Frame counting”
2) Choose the projection (left or right) in which you want to perform the frame counting
3) Select the frame in which contrast arrives at the proximal landmark (“Start frame”) and the frame in which contrast reaches the distal landmark on target vessel (“End frame”)
4) Select “Contrast” to proceed.
If you are satisfied with the analysis select “Done” and proceed, otherwise select “Back” to return in the previous pages to make corrections.
The final value that you have to consider is "**Vessel QFR Contrast**"