SOFTWARE

Educational Training Guide

NMI ParaVision 360 – PET Reconstruction Selections

PET Reconstruction Decision Tree Counts & Target Object Size

1. **Decision Tree.** A decision tree is provided in the next slides. The optimal algorithm for PET reconstruction is based largely on the sample total counts & target object size. Small nuances in parameterization exist, but the decision tree provides safe parameters defined using phantoms and animals.

2. **Reconstruction Time.** The reconstruction time can vary widely. The same file may reconstruct in minutes or hours depending on the selections applied. This is considered in the decision tree.

3. **Examples of Data Reconstructions.** Some example data and reconstructions are provided to illustrate the decision tree results.

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PET Reconstruction Algorithm Decision Tree

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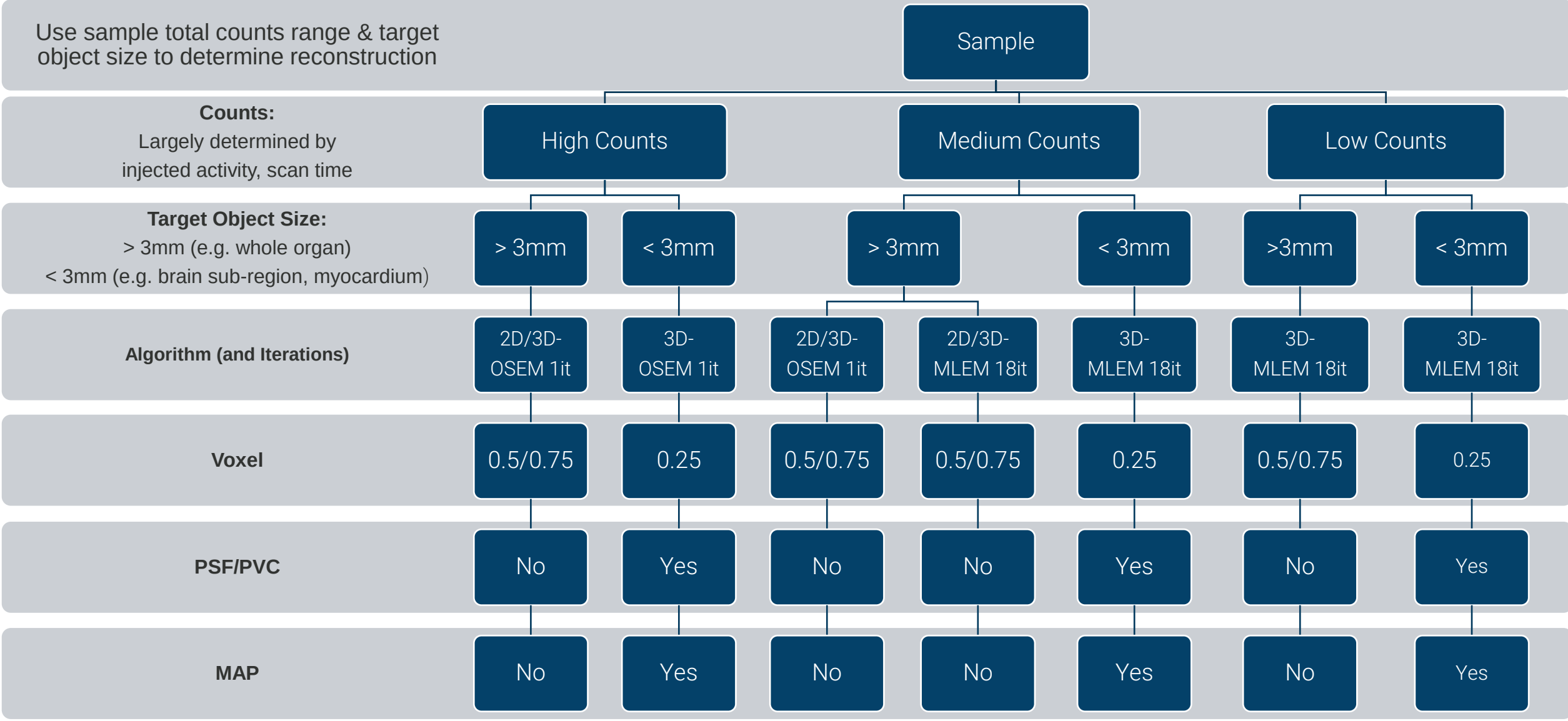
PET Reconstruction Decision Tree
Counts & Target Object Size

Use sample total counts range & target object size to determine reconstruction



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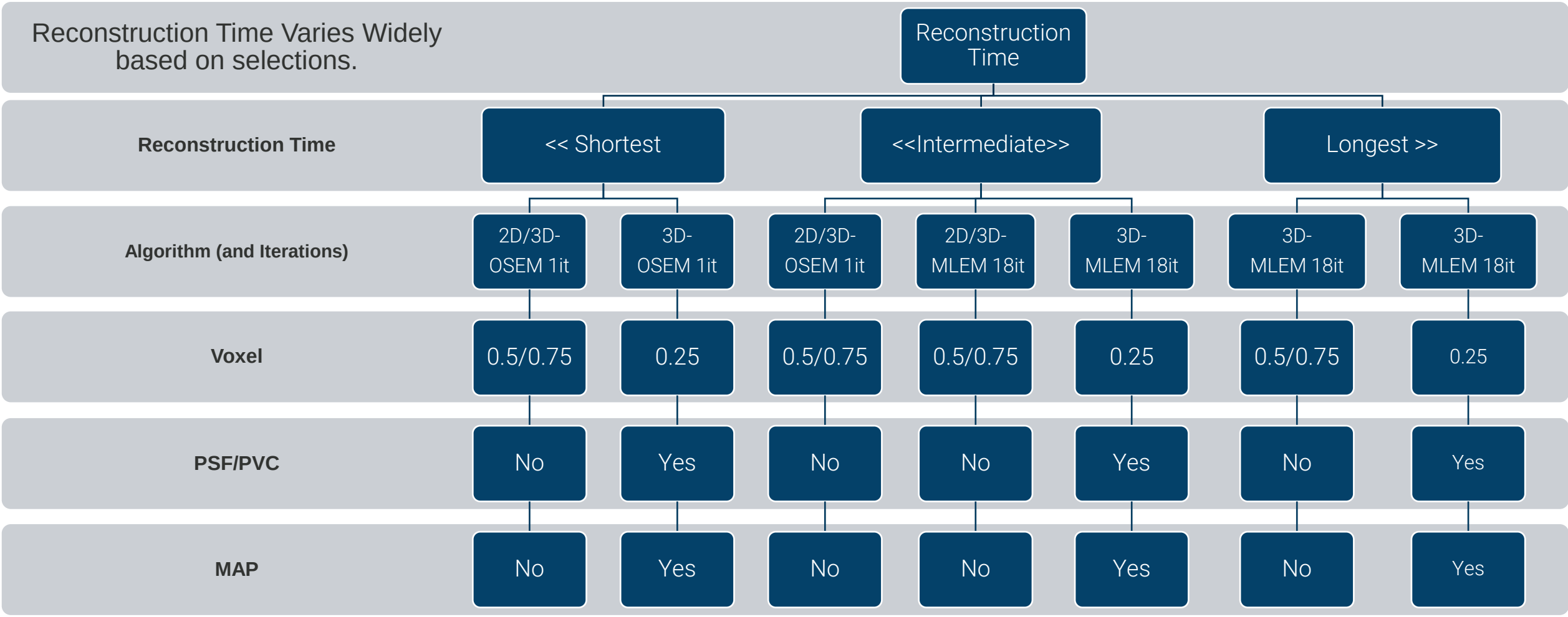
PET Reconstruction Algorithm Decision Tree & Relative Reconstruction Times

PET Reconstruction Selections
Relative Reconstruction Times

Reconstruction Time Varies Widely based on selections.



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PET Reconstruction Algorithm Decision Tree & Example Reconstructions

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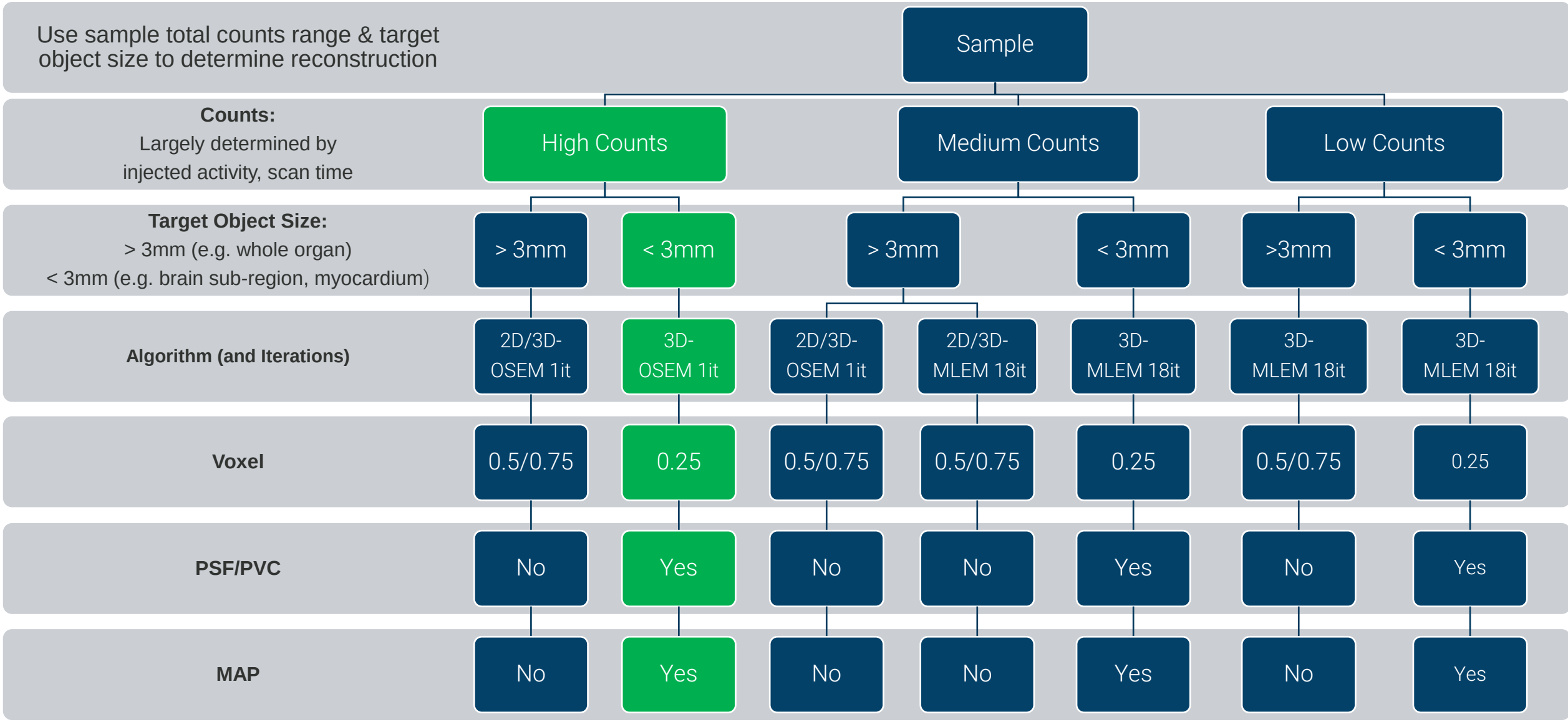
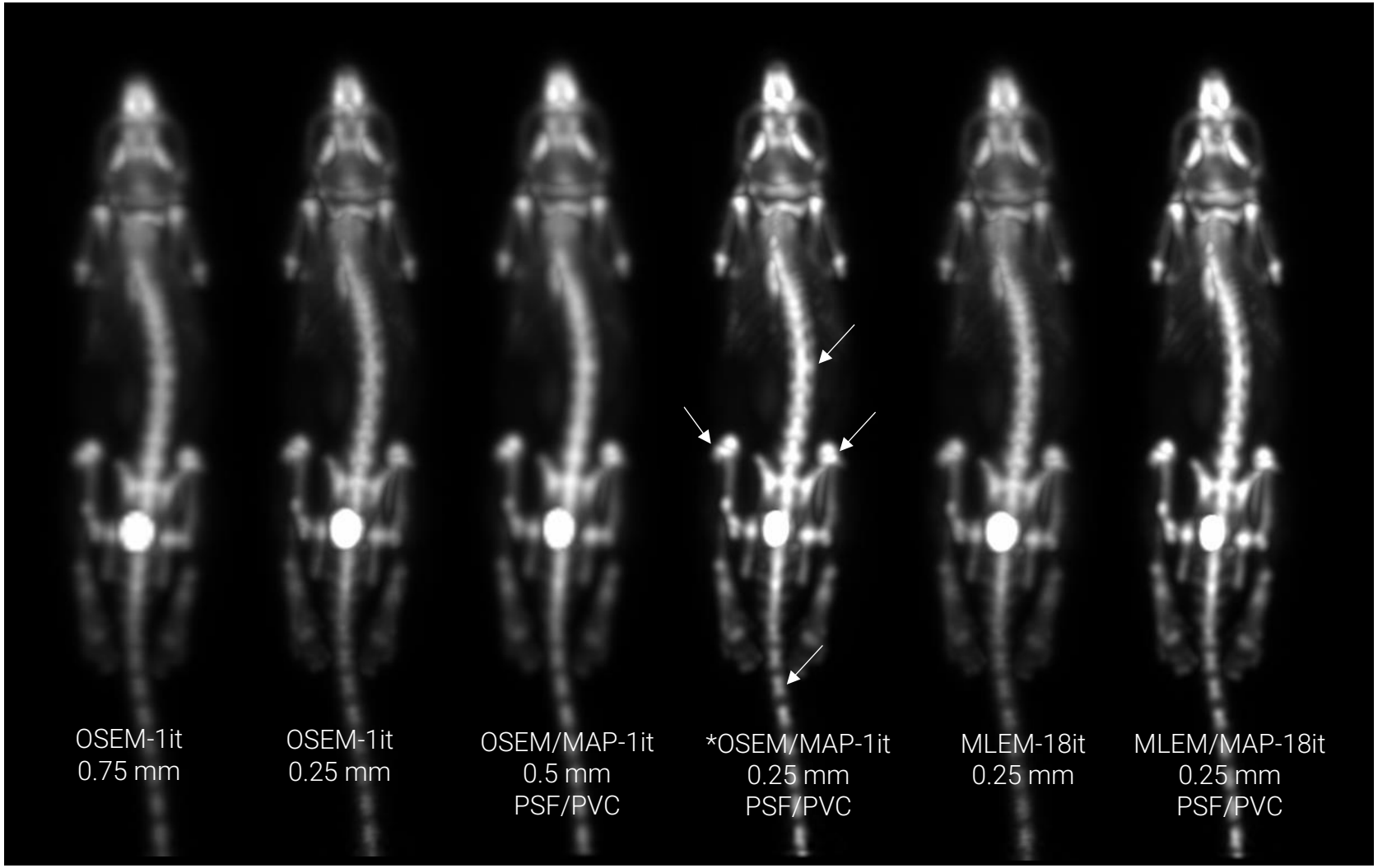
PET Reconstruction Selections
Example 1: Sample High Counts & Target Object < 3 mm



PET Reconstruction Selections
Example 1: Sample High Counts & Target Object < 3 mm

- **Sample:** Na18F mouse has small object features and high- counts.
- **Best Reconstruction:** *OSEM/MAP-1it 0.25 mm, PSF/PVC provides contrast and details for small features such as knee joints and is significantly faster than MLEM/MAP.



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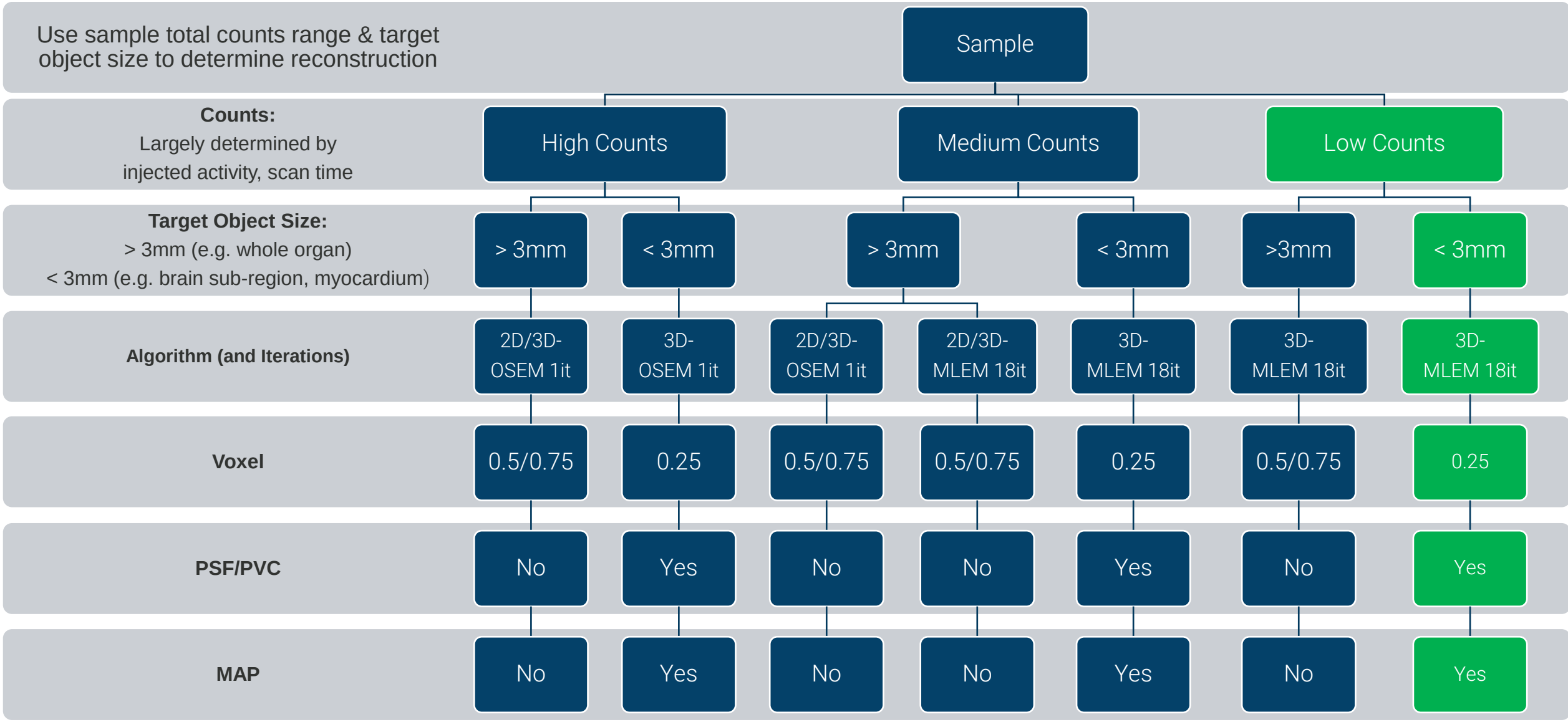
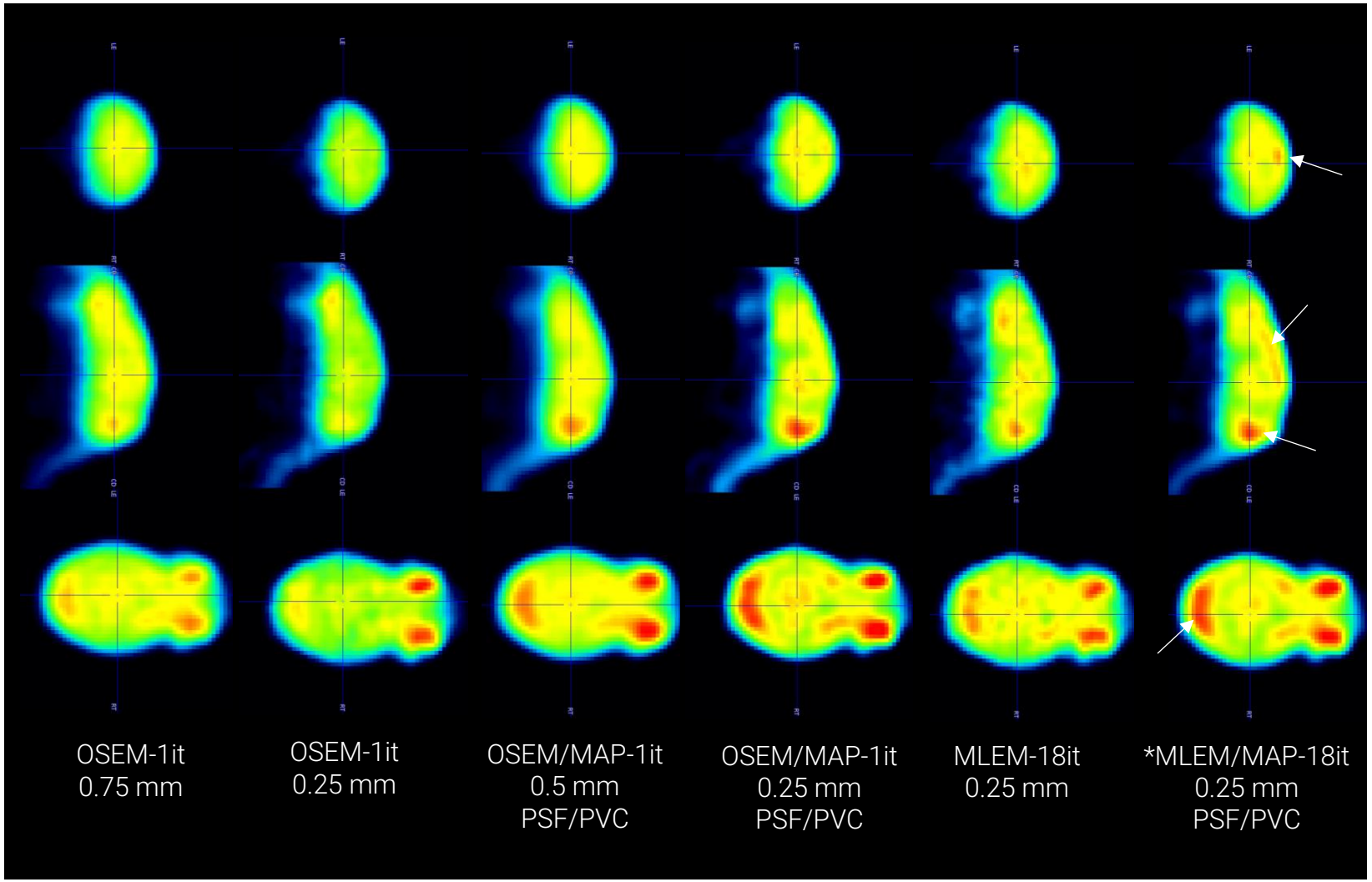
PET Reconstruction Selections
Example 2: Low Counts & Target Object < 3 mm



PET Reconstruction Selections
Example 2: Low Counts & Target Object < 3 mm

- **Sample:** 18FDG-PET mouse brain has small object features and low-counts.
- **Best Reconstruction:** *MLEM/MAP-18it 0.25 mm, PSF/PVC provides contrast and details for small features of brain, such as cortex. This is the longest reconstruction selection, but is required in this scenario to resolve finest details.



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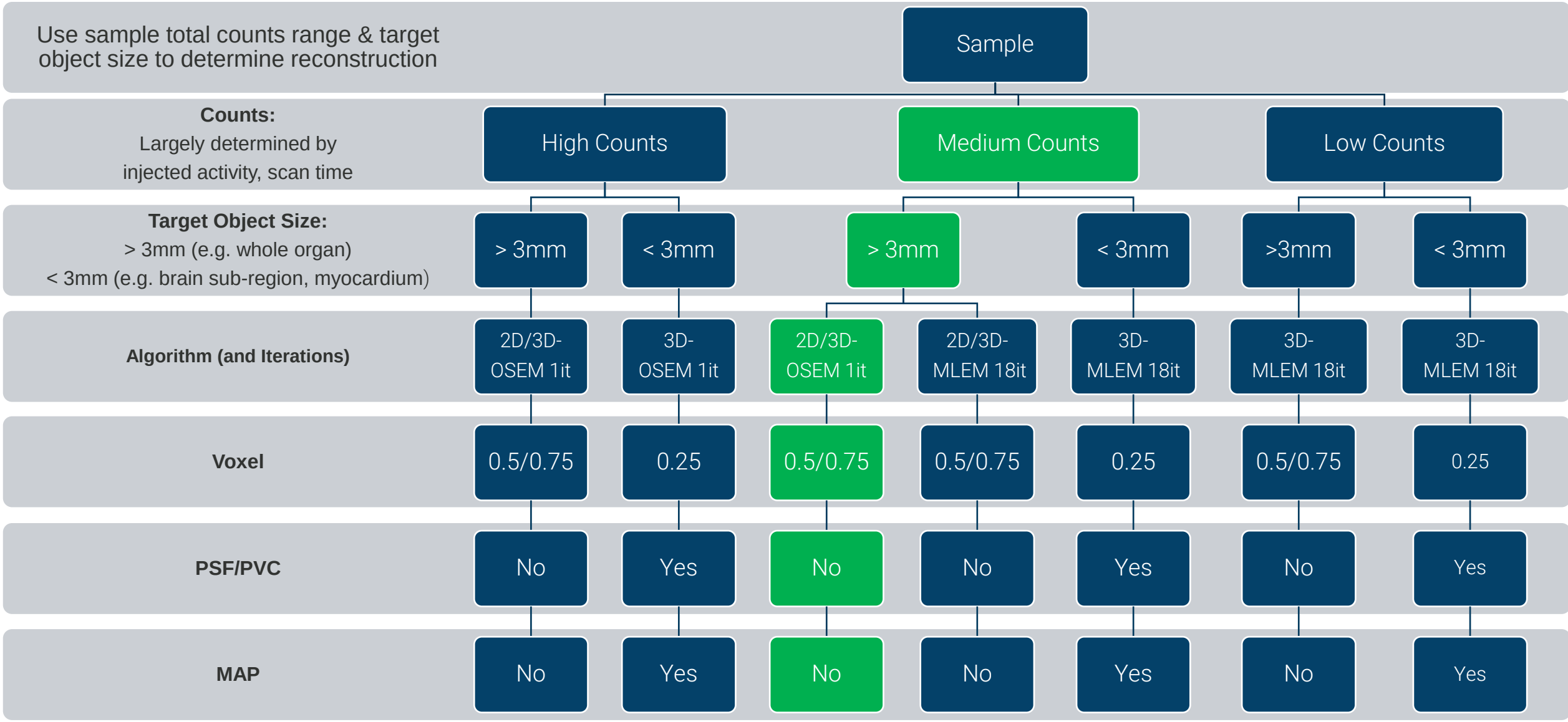
PET Reconstruction Selections
Example 3: Medium Counts & Target Object > 3 mm



PET Reconstruction Selections
Example 3: Medium Counts & Target Object > 3 mm

- **Sample:** 18FDG-PET mouse xenograft tumour with homogenous tracer distribution with features > 3mm.
- **Best Reconstruction: *OSEM-1it 0.75 mm,** provides contrast and details of the tumour with fastest reconstruction time.