

# NLST Acquisition Parameters

ACRIN/NLST CT Technique Comparison Chart: Scanner Specific Techniques Mandated by NLST Protocol

| Parameter  | GE QXi<br>4-slice/0.8 sec | GE LS Plus<br>4-slice/0.5 sec | GE Ultra<br>8-slice/0.5 sec | GE – LS 16<br>16-slice/0.5 sec | GE – VCT(64)<br>64-slice/0.5 sec |
|--|---------------------------|-------------------------------|-----------------------------|--------------------------------|----------------------------------|
| kV   | 120                       | 120                           | 120                         | 120                            | 120                              |
| Gantry Rotation Time   | 0.8 sec                   | 0.5 sec                       | 0.5 sec                     | 0.5 sec                        | 0.5 sec                          |
| mA (Regular patient-Large patient values)                    | 50-100                    | 80-160                        | 80-160                      | 80-160                         | 50-100                           |
| mAs (Regular-Large) <sup>1</sup>                             | 40-80                     | 40-80                         | 40-80                       | 40-80                          | 25-50                            |
| Scanner effective mAs <sup>2</sup> (Reg-Lg)                  | 26.7-53                   | 26.7-53                       | 29.6-59.2                   | 29.1-58.2                      | 27-53                            |
| Detector Collimation (mm)—T                                  | 2.5 mm                    | 2.5 mm                        | 1.25 mm                     | 1.25 mm                        | 0.625 mm                         |
| Number of active channels—N                                  | 4                         | 4                             | 8                           | 16                             | 64                               |
| Detector Configuration—N × T                                 | 4 × 2.5 mm                | 4 × 2.5 mm                    | 8 × 1.25 mm                 | 16 × 1.25 mm                   | 64 × 0.625 mm                    |
| MODE (Thick/Speed)   | 2.5/HS/15                 | 2.5/HS/15                     | 1.25/HS/13.5                | 1.25/1.375/27.5                | .625/.984/39.37                  |
| Table incrementation (mm/rotation)—I                         | 15 mm                     | 15 mm                         | 13.5 mm                     | 27.5 mm                        | 39.37 mm                         |
| Pitch ([mm/rotation]/beam collimation)—I/NT                  | 1.5                       | 1.5                           | 1.35                        | 1.375                          | 0.984                            |
| Table Speed (mm/second)                                      | 18.75 mm/sec              | 30 mm/sec                     | 22.5 mm/sec                 | 55 mm/sec                      | 78.74 mm/sec                     |
| Scan Time (40 cm thorax)                                     | 22 sec                    | 13 sec                        | 18 sec                      | 7.3 sec                        | 5.1 sec                          |
| Nominal Reconstructed Slice Width                            | 2.5 mm                    | 2.5 mm                        | 2.5 mm                      | 2.5 mm                         | 2.5 mm                           |
| Reconstruction Interval <sup>3</sup>                         | 2.0 mm                    | 2.0 mm                        | 2.0 mm                      | 2.0 mm                         | 2.0 mm                           |
| Reconstruction Algorithm <sup>3</sup>                        | STD                       | STD                           | STD                         | STD                            | STD                              |
| # Images/Data set (40 cm thorax)                             | 200                       | 200                           | 200                         | 200                            | 200                              |
| CTDI <sub>vol</sub> Dose in mGy <sup>4</sup> (Regular-Large) | 2.8-5.6 mGy               | 2.4-4.9 mGy                   | 3.1-6.2 mGy                 | 2.7-5.4 mGy                    | 2.2-4.4 mGy                      |

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| Parameter   | Philips<br>MX8000<br>4-slice/0.5 sec<br>4 × 2.5 | Philips<br>MX8000<br>4-slice/0.5 sec<br>4 × 1 | Philips MX8000<br>16 slice/0.5 sec<br>16 × .75 | Toshiba<br>Aquilion<br>4-slice/0.5 sec | Toshiba Aquilion<br>16-slice/0.5 sec |
|---|---|---|--|--|--------------------------------------|
| kV  | 120   | 120   | 120  | 120                                    | 120                                  |
| Gantry Rotation Time  | 0.5 sec   | 0.5 sec                                       | 0.5 sec  | 0.5 sec                                | 0.5 sec                              |
| mA (Regular patient-Large patient values)                             | 75-150  | 80-160  | 75-150   | 80-160                                 | 80-160                               |
| mAs (Regular-Large) <sup>1</sup>                                      | 37.5-75   | 40-80   | 37.5-75  | 40-80                                  | 40-80                                |
| Scanner effective mAs <sup>2</sup> or mAs/slice <sup>2</sup> (Reg-Lg) | 25-50   | 20-40   | 25-50  | 26.7-53.3                              | 26.7-53.3                            |
| Detector Collimation (mm)—T   | 2.5 mm  | 1 mm  | .75 mm   | 2 mm                                   | 2 mm                                 |
| Number of active channels—N   | 4   | 4   | 16   | 4                                      | 16                                   |
| Detector Configuration—N × T  | 4 × 2.5 mm                                      | 4 × 1 mm                                      | 16 × 0.75 mm                                   | 4 × 2 mm                               | 16 × 2 mm                            |
| MODE (Thick/Speed)  | N/A   | N/A   | N/A  | N/A                                    | N/A                                  |
| Table incrementation (mm/rotation)—I                                  | 15 mm   | 8 mm  | 18 mm  | 12 mm                                  | 48 mm                                |
| Pitch ([mm/rotation]/beam collimation)—I/NT                           | 1.5   | 2   | 1.5  | 1.5                                    | 1.5                                  |
| Table Speed (mm/second)   | 30 mm/sec                                       | 16 mm/sec                                     | 36 mm/sec                                      | 24 mm/sec                              | 96 mm/sec                            |
| Scan Time (40 cm thorax)  | 13 sec  | 25 sec  | 11 sec   | 17 sec                                 | 4.2 sec                              |
| Nominal Reconstructed Slice Width                                     | 3.2 mm  | 2 mm  | 2 mm   | 2 mm                                   | 2 mm                                 |
| Reconstruction Interval <sup>3</sup>                                  | 2.0 mm  | 1.8 mm  | 1.8 mm   | 1.8 mm                                 | 1.8 mm                               |
| Reconstruction Algorithm <sup>3</sup>                                 | B or C  | B or C  | B or C   | FC 10                                  | FC 10                                |
| # Images/Data set (40 cm thorax)                                      | 200   | 223   | 223  | 223                                    | 223                                  |
| CTDI <sub>vol</sub> Dose in mGy <sup>4</sup> (Regular-Large)          | 2.0-4.1 mGy                                     | 2.8-5.5 mGy                                   | 1.9-3.8 mGy                                    | 3.0-6.0 mGy                            | 2.7-5.4 mGy                          |

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| Parameter                                      | Siemens<br>Vol Zoom/Sensation 4<br>4-slice/0.5 sec<br>4 × 2.5 | Siemens<br>Vol Zoom/Sensation 4<br>4-slice/0.5 sec<br>4 × 1 | Siemens<br>Sensation 16<br>16 × .75 | Siemens<br>Sensation 64<br>64 × 0.6<br>(beam collimation 32 × 0.6) |
|--|---|---|-------------------------------------|--|
| kV   | 120   | 120   | 120                                 | 120  |
| Gantry Rotation Time                           | 0.5 sec   | 0.5 sec   | 0.5 sec                             | 0.5 sec  |
| mA (Regular patient-Large patient values)      | 75–150  | 80–160  | 75–150                              | 50–100   |
| mAs (Reg-Lg) <sup>1</sup>                      | 37.5–75   | 40–80   | 37.5–75                             | 25–50  |
| Scanner effective mAs <sup>2</sup> (Reg-Lg)    | 25–50   | 20–40   | 25–50                               | 25–50  |
| Detector Collimation (mm)—T                    | 2.5 mm  | 1 mm  | 0.75 mm                             | 0.6 mm   |
| Number of active channels—N                    | 4   | 4   | 16                                  | 32   |
| Detector Configuration—N × T                   | 4 × 2.5 mm  | 4 × 1 mm  | 16 × .75 mm                         | 32 × 0.6 mm  |
| Collimation (on operator console)              | N/A   | N/A   | N/A                                 | 64 × 0.6 mm  |
| Table incrementation (mm/rotation)—I           | 15 mm   | 8 mm  | 18 mm                               | 19.2 mm  |
| Pitch ([mm/rotation]/beam collimation)—I/NT    | 1.5   | 2   | 1.5                                 | 1.0  |
| Table Speed (mm/second)                        | 30 mm/sec   | 16 mm/sec   | 36 mm/sec                           | 38.4 mm/sec  |
| Scan Time (40 cm thorax)                       | 13 sec  | 25 sec  | 11 sec                              | 11 sec   |
| Nominal Reconstructed Slice Width              | 3 mm  | 2 mm  | 2 mm                                | 2 mm   |
| Reconstruction Interval <sup>3</sup>           | 2.0 mm  | 1.8 mm  | 1.8 mm                              | 1.8 mm   |
| Reconstruction Algorithm <sup>3</sup>          | B30   | B30   | B30                                 | B30  |
| # Images/Data set (40 cm thorax)               | 200   | 223   | 223>                                | 223  |
| CTDI <sub>vol</sub> (Dose in mGy) <sup>4</sup> | 2.0–4.1 mGy   | 2.8–5.5 mGy   | 1.9–3.8 mGy                         | 1.9–3.8 mGy  |