(T-71019, SRT, "Vascular Structure of Kidney")	(G-A101, SRT, "Left") for Left, or (G-A100, SRT, "Right") for Right.	DCID 12115 Renal Vessels Or SRT T-71000 Kidney Or SRT T74000 Bladder	DCID 12124 Renal Ratios	

Anatomy GEU parameter	Code and Description
MRenalA	(T-46600, SRT, "Renal Artery")
RenalV	(T-48740, SRT, "Renal Vein")
SegmentalA	(T-46659, SRT, "Segmental Artery")
InterlobarA	(T-4667D, SRT, "Interlobar Artery of Kidney")
ArcurateA	(T-4668A, SRT, "Arcuate Artery of the Kidney")
Aorta	(T-4200, SRT, "Aorta")
RenalVolume	(G-D705, SRT, "Renal Volume")
NewBladderDistL	(G-A22A, SRT, "Bladder Length")
NewBladderDistH	(121207, DCM, "Bladder Height")
NewBladderDistW	(G-A220, SRT, "Bladder Width")
NewBladderVolume	(G-D705, SRT, "Bladder Volume")
NewPostBladderDistL	(GEU-1004-32, GEU, "Post Void Bladder Length")
NewPostBladderDistH	(GEU-1004-33, GEU, "Post Void Bladder Height")
NewPostBladderDistW	(GEU-1004-34, GEU, "Post Void Bladder Width")
NewPostBladderVolume	(GEU-1004-35, GEU, "Post Void Bladder Volume")
CorticalThickness	(GEU-1007-13, GEU, "CorticalThickness")

TABLE 15.6.7. Renal **Study Folder Code Maps**

(T-46002, SRT, “Artery of Abdomen”)	(G-A101, SRT, “Left”) for Left, (G-A100, SRT, “Right”) for Right or (G-A103, SRT, “Unilateral”) Or (G-C0E3, SRT, “Finding”)	DCID 12111 or 12112 Abdominal Arteries (lateral or unilateral). DCID 12113 or 12114 Abdominal Veins (lateral or unilateral) or DCID 12115 Renal Vessels Or SRT T-C3000 Spleen Or SRT T-71000 Kidney		

Anatomy GEU parameter	Code and Description
Aorta	(T-42000, SRT, “Aorta”)
Celiac	(T-46400, SRT, ”Celiac Axis”)
CHA	(T-46421, SRT, ”Common Hepatic Artery”)
Splenic A	(T-46460, SRT, ”Splenic Artery”)
SMA	(T-46510, SRT, ”Superior Mesenteric Artery”)
IMA	(T-46520, SRT, ”Inferior Mesenteric Artery”)
MRenalA	(T-46600, SRT, “Renal Artery”)
RenalV	(T-48740, SRT, “Renal Vein”)
SegmentalA	(T-46659, SRT, “Segmental Artery”)
InterlobarA	(T-4667D, SRT, “Interlobar Artery of Kidney”)
ArcurateA	(T-4668A, SRT, “Arcuate Artery of the Kidney”)
CIA	(T-46710, SRT, ”Common Iliac Artery”)
PrHepatic	(T-46422, SRT, “Proper Hepatic Artery”)
GDA	(T-46440, SRT, Gastroduodenal Artery)
IVC	(T-48710, SRT, “Inferior Vena Cava”)
Splenic V	(T-48890, SRT, Splenic Vein”)
Hepatic V	(T-48720, SRT, Hepatic Vein”)
MHV	(T-48726, SRT, Middle Hepatic Vein”)
MPV	(GEU-1004-65, 99GEMS, ”Main Branch of Portal Vein”)
Portal V	(T-48810, SRT, ”Portal Vein”)
SMV	(T-48840, SRT, ”Superior Mesenteric Vein”)
TIPS	(G-036C, SRT, ”Transjugular Intrahepatic Portosystemic Shunt”)
CIV	(T-48920, SRT, ”Common Iliac Vein”)

TABLE 15.6.8 Abdomen **Study Folder Code Maps**

(T-46002, SRT, "Artery of Abdomen") Continued

Anatomy GEU parameter	Code and Description
DiamRatioD1	(121206, DCM, "Distance")
DiamRatioD2	(121206, DCM, "Distance")
ABDiamRatio	(GEU-1004-55, 99GEMS, "A/B Diameter Ratio")
AreaRatioA1	(121056, DCM, "Area Outline")
AreaRatioA2	(121056, DCM, "Area Outline")
ABAreaRatio	(GEU-1004-66, 99GEMS, "A/B Area Ratio")
SplenicDistL	(G-A22A, SRT, "Splenic Length")
SplenicDistH	(121207, DCM, "Splenic Height")
SplenicDistW	(G-A220, SRT, "Splenic Width")
SplenicVolume	(G-D705, SRT, "Splenic Volume")
RenalVolumeD1	(GEU-1004-52, 99GEMS, "Volume Diameter 1")
RenalVolumeD2	(GEU-1004-53, 99GEMS, "Volume Diameter 2")
RenalVolumeD3	(GEU-1004-54, 99GEMS, "Volume Diameter 3")
RenalManVolume	(G-D705, SRT, "Volume")

TABLE 15.6.8 Abdomen **Study Folder Code Maps (continued)**

15.7 TID 300 MEASUREMENT

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			NUM	$Measurement	1	M		Units = $Units
3	>	HAS CONCEPT MOD	CODE	EV(GEU-1005-5, 99GEMS, Measurement Label)	1	UC	Only for AP or Trans	- AP (122675, Anterior-Posterior, DCM,) - Trans (G-A117. Transverse, SRT)
4	>	HAS CONCEPT MOD	CODE	EV(G-A1F8, SRT, "Topographical modifier")	1	U		See 15.9 GE Ultrasound Sidedness and Vessel Location
5	>	HAS CONCEPT MOD	CODE	EV(121401, DCM, "Derivation")	1	U		See 15.11 Derivation and Selection
6	>	HAS PROPERTIES	CODE	EV(121404, DCM, "Selection Status")	1	U		See 15.11 Derivation and Selection

15.8 GE ULTRASOUND MODES

GE Ultrasound Modes	Code Value
2D	(G-03A2, SRT, "2D mode")
CF	(R-409E2, SRT, "Doppler Color Flow")
PW	(R-409E4, SRT, "Doppler Pulsed")
MM	(G-0394, SRT, "M mode")
CW	(R-409E3, SRT, "Doppler Continuous Wave")

15.9 GE ULTRASOUND SIDEDNESS AND VESSEL LOCATION

Side	Code Value
Rt	(G-A100, SRT, "Right")
Lt	(G-A101, SRT, "Left")

Vessel Location	Code Value
Prox	(G-A118, SRT, "Proximal")
Mid	(G-A188, SRT, "Mid-longitudinal")
Dist	(G-A119, SRT, "Distal")

Note (*) when there is no Sidedness or Locations, the SR nodes are not populated.

15.10 SR MAPPING TABLE FOR VASCULAR BASE MEASUREMENT CONCEPT

GEU Measurement Parameter	Standard Measurement Concept Name

PS	(11726-7, LN, “Peak Systolic Velocity”)
ED	(11653-3, LN, “End Diastolic Velocity”)
MD	(11665-7, LN, “Minimum Diastolic Velocity”)
Tamax	(11692-1, LN, “Time averaged peak velocity”)
PI	(12008-9, LN, “Pulsatility Index”)
RI	(12023-8, LN, “Resistivity Index”)
PV	(11726-7, LN, Peak Velocity)
SD Ratio	(12144-2, LN, “Systolic to Diastolic Velocity Ratio”)
DS Ratio	(122218, DCM, Diastolic/Systolic velocity ratio)
Accel	(20167-3, LN, “Acceleration Index”)
AT	(20168-1, LN, “Acceleration Time”)
TAMEAN	(20352-1, LN, “Time averaged mean velocity”)
VOLFLOW	(33878-0, LN, “Volume flow”)
ICACCA Ratio (PS)	(33868-1, LN, “ICA/CCA velocity ratio”)
HR (Heart Rate)	(8867-4, LN, Heart Rate)
AC	(**GEU-1004-9, 99GEMS, “**Angular Correction”)
RAR	(33869-9, LN, “Renal Artery/Aorta velocity ratio”)
PS/Hz	(GEU-1004-13, 99GEMS, 'Peak Systolic Frequency')
ED/Hz	(GEU-1004-14, 99GEMS, 'End Diastolic Frequency')
MD/Hz	(GEU-1004-16, 99GEMS, 'Minimum Diastolic Frequency')
PV/Hz	(GEU-1004-15, 99GEMS, 'Peak Velocity Frequency')
RefluxTime	(GEU-1004-22, 99GEMS, ‘Reflux Time’)
GreatSaphAccess	(GEU-1004-73, 99GEMS, 'Great Saphenous Vein of Accessory')

TABLE 15.10.1 PWD-MODE MEASUREMENTS

GEU Measurement Parameter	Standard Measurement Concept Name
DiamStenD1/D2	(G-0364 , SRT, ” Vessel Lumen Diameter”)
AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Sectional Area”)
StenosisD	(R-101BB, SRT, ” Lumen Diameter Stenosis”)
StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”)
IMT Ant Avg	(GEU-1005-20, 99GEMS, “IMT Anterior Average”)
IMT Ant Max	(GEU-1005-21, 99GEMS, “IMT Anterior Max”)
IMT Ant Min	(GEU-1005-22, 99GEMS, “IMT Anterior Min”)
IMT Ant SD	(GEU-1005-23, 99GEMS, “IMT Anterior SD”)
IMT Ant nMeas	(GEU-1005-24, 99GEMS, “IMT Anterior nMeas”)
IMT Post Avg	(GEU-1005-26, 99GEMS, “IMT Posterior Average”)
IMT Post Max	(GEU-1005-27, 99GEMS, “IMT Posterior Max”)
IMT Post Min	(GEU-1005-28, 99GEMS, “IMT Posterior Min”)
IMT Post SD	(GEU-1005-29, 99GEMS, “IMT Posterior SD”)
IMT Post nMeas	(GEU-1005-30, 99GEMS, “IMT Posterior nMeas”)
Aorta AP	(Diameter, SRT, M-02550), with Measurement Label (“Anterior-Posterior”, DCM 122675)

Aorta Trans	(Diameter, SRT, M-02550), with Measurement Label (“Transverse”, SRT, G-A117)
ILA AP	(Diameter, SRT, M-02550) with Measurement Label (“Anterior-Posterior”, DCM, 122675)
ILA Trans	(Diameter, SRT, M-02440), with Measurement Label (“Transverse”, SRT, G-A117)
DiamRatioD1, DiamRatioD2	(121206, DCM, “Distance”)
ABDiamRatio	(GEU-1004-55, 99GEMS, “A/B Diameter Ratio”)
AreaRatioA1, AreaRatioA2	(121056, DCM, “Area Outline”)
ABAreaRatio	(GEU-1004-66, 99GEMS, “A/B Area Ratio”)
ComIliac AP	(M-02550, SRT, “Common Iliac Artery Diameter”) With Measurement Label (122675, DCM, “Anterior-Posterior”) Inside (T-46710, SRT, “Common Iliac Artery”)
ComIliacTrans	(M-02550, SRT, “Common Iliac Artery Diameter”) With Measurement Label (G-A117, SRT, “Transverse”) Inside (T-46710, SRT, “Common Iliac Artery”)
ComIliac DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) Inside (T-46710, SRT, “Common Iliac Artery”)
ComIliac StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) Inside (T-46710, SRT, “Common Iliac Artery”)
ComIliac AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Sectional Area”) Inside (T-46710, SRT, “Common Iliac Artery”)
ComIliac StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) Inside (T-46710, SRT, “Common Iliac Artery”)
ExtIliac AP	(M-02550, SRT, “External Iliac Artery Diameter”) with Measurement Label (122675, DCM, “Anterior-Posterior”) Inside (T-46910, SRT, “External Iliac Artery”)
ExtIliac Trans	(M-02550, SRT, “External Iliac Artery Diameter”) with Measurement Label (G-A117, SRT, “Transverse”) Inside (T-46910, SRT, “External Iliac Artery”)
ExtIliac DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) Inside (T-46910, SRT, “External Iliac Artery”)
ExtIliac StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) Inside (T-46910, SRT, “External Iliac Artery”)
ExtIliac AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Sectional Area”) Inside (T-46910, SRT, “External Iliac Artery”)
ExtIliac StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) Inside (T-46910, SRT, “External Iliac Artery”)
ComFemoral AP	(M-02550, SRT, “Common Femoral Artery Diameter”) with Measurement Label (122675, SRT, “Anterior-Posterior”) Inside (T-47400, SRT, “Common Femoral Artery”)
ComFemoral Trans	(M-02550, SRT, “Common Femoral Artery Diameter”) with Measurement Label (G-A117, SRT, “Transverse”) Inside (T-47400, SRT, “Common Femoral Artery”)
ComFemoral Diam StenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) Inside (T-47400, SRT, “Common Femoral Artery”)
ComFemoral StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) Inside (T-47400, SRT, “Common Femoral Artery”)
ComFemoral AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Sectional Area”) Inside (T-47400, SRT, “Common Femoral Artery”)

ComFemoral StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) Inside (T-47400, SRT, “Common Femoral Artery”)
AP	(M-02550, SRT, ‘Diameter’) with Measurement Labels (122675, DCM, ‘Anterior-Posterior’)
2D AP	(M-02550, SRT, “Aorta”) with Measurement Label (122675, SRT, “Anterior-Posterior”) inside (T-42000, SRT, Aorta)
Trans	(M-02550, SRT, ‘Diameter’) with Measurement Labels (G-A117, SRT, ‘Transverse’)
2D Trans	(M-02550, SRT, “Aorta”) with Measurement Label (G-A117, SRT, “Transverse”) inside (T-42000, SRT, Aorta)
VFDiam	(GEU-1004-49, 99GEMS, 'Volume Flow Diameter')

TABLE 15.10.2 VASCULAR B-MODE MEASUREMENTS

GEU Measurement Parameter	Standard Measurement Concept Name
LiverDistL	(G-A22A, SRT, “Liver Length”) Inside (T-62002, SRT, Liver) container
LiverDistH	(121207, DCM, “Liver Height”) Inside (T-62002, SRT, Liver) container
LiverDistW	(G-A220, SRT, “Liver Width”) Inside (T-62002, SRT, Liver) container
LiverVolume	(G-D705, SRT, “Liver Volume”) Inside (T-62002, SRT, Liver) container
MassDistL	(G-A22A, SRT, “Mass Length”) Inside (M-03000, SRT, Mass) container
MassDistH	(121207, DCM, “Mass Height”) Inside (M-03000, SRT, Mass) container
MassDistW	(G-A220, SRT, “Mass Width”) Inside (M-03000, SRT, Mass) container
MassVolume	(G-D705, SRT, “Mass Volume” Inside (M-03000, SRT, Mass) container
CystDistL	(G-A22A, SRT, “Cyst Length”) Inside (M-3340A, SRT, Cyst) container
CystDistH	(121207, DCM, “Cyst Height”) Inside (M-3340A, SRT, Cyst) container
CystDiswW	(G-A220, SRT, “Cyst Width”) Inside (M-3340A, SRT, Cyst) container
CystDistVolume	(G-A220, SRT, “Cyst Volume”) Inside (M-3340A, SRT, Cyst) container
PancHead	(GEU-1004-59, GEU, “Pancreas Head Diameter”) Inside (T-D4034, SRT, Pancreas) container
PancDuct	(GEU-1004-61, GEU, “Pancreas Duct Diameter”) Inside (T-D4034, SRT, Pancreas) container
PancBody	(GEU-1004-60, GEU, “Pancreas Body Diameter”) Inside (T-D4034, SRT, Pancreas) container
CBDporta	(GEU-1004-67, GEU, “Common bile duct porta”) Inside (T-60610, SRT, Bile Duct) container
CBDpanc	(GEU-1004-68, GEU, “Common bile duct pancreas”)

	Inside (T-60610, SRT, Bile Duct) container
GBW	(GEU-1004-38, GEU, "Thickness of Gall Bladder Wall") Inside (T-63000, SRT, Gall Bladder) container
GBL	(G-A22A, SRT, "Gall Bladder Length") Inside (T-63000, SRT, Gall Bladder) container
AoProxAP	(M-02550, SRT, "Aorta Diameter") with (122675, DCM, "Anterior-Posterior) inside (T-42000, SRT, Aorta) with (Proximal, SRT,G-A118) as Topographical Modifier
AoProxTrans	(M-02550, SRT, "Aorta Diameter") with (G-A117, SRT, "Transverse") inside (T-42000, SRT, Aorta) with (Proximal, SRT,G-A118) as Topographical Modifier
AoMidAP	(M-02550, SRT, "Aorta Diameter") with (122675, DCM, "Anterior-Posterior") inside (T-42000, SRT, Aorta) with (Mid-longitudinal, SRT,G-A188) as Topographical Modifier
AoMidTrans	(M-02550, SRT, "Aorta Diameter") with (122675, DCM, "Anterior-Posterior") inside (T-42000, SRT, Aorta) with (Mid-longitudinal, SRT,G-A188) as Topographical Modifier
AoDistAP	(M-02550, SRT, "Aorta Diameter) with (122675, DCM, "Anterior-Posterior") inside (T-42000, SRT, Aorta) with (Distal, SRT,G-A119) as Topographical Modifier
AoDistTrans	(M-02550, SRT, "Aorta Diameter") with (G-A117, SRT, "Transverse") inside (T-42000, SRT, Aorta) with (Distal, SRT,G-A119) as Topographical Modifier
IliacAP	(M-02550, SRT, "Iliac artery Diameter") with Measurement Label (122675, DCM, "Anterior-Posterior") inside (T-46710, SRT, Common Iliac Artery)
IliacTrans	(M-02550, SRT, "Iliac artery Diameter") with Measurement Label (G-A117, SRT, "Transverse") inside (T-46710, SRT, Common Iliac Artery)
BladderDistL	(G-A22A, SRT, "Bladder Length") Inside (T-74000, SRT, Bladder) container
BladderDistH	(121207, DCM, "Bladder Height") Inside (T-74000, SRT, Bladder) container
BladderDistW	(G-A220, SRT, "Bladder Width") Inside (T-74000, SRT, Bladder) container
BladderVolume	(G-D705, SRT, "Bladder Volume") Inside (T-74000, SRT, Bladder) container
CeliacA AP	(M-02550, SRT, "Celiac Axis Diameter") with Measurement Label (122675, DCM, "Anterior-Posterior") inside (T-46400, SRT, Celiac Axis)
CeliacA Trans	(M-02550, SRT, "Celiac Axis Diameter") with Measurement Label (G-A117, SRT, "Transverse") inside (T-46400, SRT, Celiac Axis)
CeliacA DiamStenD1/D2	(G-0364, SRT, "Vessel Lumen Diameter") inside (T-46400, SRT, Celiac Axis)
CeliacA Stenosis D	(R-101BB, SRT, "Lumen Diameter Stenosis") inside (T-46400, SRT, Celiac Axis)
CeliacA AreaStenA1/A2	(G-0366, SRT, "Vessel Lumen Cross-Section Area") inside (T-46400, SRT, Celiac Axis)
CeliacA StenosisA	(R-101BA, SRT, "Lumen Area Stenosis")

	inside (T-46400, SRT, Celiac Axis)
CeliacA SMA AP	(R-101BA, SRT, “Lumen Area Stenosis”) inside (T-46400, SRT, Celiac Axis)
SMA AP	(M-02550, SRT, “Superior Mesenteric Artery Diameter”) with Measurement Label (122675, DCM, “Anterior-Posterior”) inside (T-46510, SRT, Superior Mesenteric Artery)
SMA Trans	(M-02550, SRT, “Superior Mesenteric Artery Diameter”) with Measurement Label (G-A117, SRT, “Transverse”) inside (T-46510, SRT, Superior Mesenteric Artery)
SMA DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) inside (T-46510, SRT, Superior Mesenteric Artery)
SMA StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) inside (T-46510, SRT, Superior Mesenteric Artery)
SMA AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Section Area”) inside (T-46510, SRT, Superior Mesenteric Artery)
SMA StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) inside (T-46510, SRT, Superior Mesenteric Artery)
IMA AP	(M-02550, SRT, “Inferior Mesenteric Artery Diameter”) with Measurement Label (122675, DCM, “Anterior-Posterior”) inside (T-46520, SRT, Inferior Mesenteric Artery)
IMA Trans	(M-02550, SRT, “Inferior Mesenteric Artery Diameter”) with Measurement Label (G-A117, SRT, “Transverse”) inside (T-46520, SRT, Inferior Mesenteric Artery)
IMA DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) inside (T-46520, SRT, Inferior Mesenteric Artery)
IMA StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) inside (T-46520, SRT, Inferior Mesenteric Artery)
IMA AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Section Area”) inside (T-46520, SRT, Inferior Mesenteric Artery)
IMA StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) inside (T-46520, SRT, Inferior Mesenteric Artery)
Stent AP	(M-02550, SRT, “Vessel Diameter”) with Measurement Label (122675, DCM, “Anterior-Posterior”) inside (A-25500, SRT, Stent)
Stent Trans	(M-02550, SRT, “Vessel Diameter”) with Measurement Label (G-A117, SRT, “Transverse”) inside (A-25500, SRT, Stent)
Stent DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) inside (A-25500, SRT, Stent)
Stent StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) inside (A-25500, SRT, Stent)
Stent AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Section Area”) inside (A-25500, SRT, Stent)
Stent StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) inside (A-25500, SRT, Stent)
PreStent AP	(M-02550, SRT, “Vessel Diameter”) with Measurement Label (122675, DCM, “Anterior-Posterior”) inside (GEU-1004-71, GEU, Pre-Stent)
PreStent Trans	(M-02550, SRT, “Stent”) with Measurement Label (G-A117, SRT, “Transverse”) inside (GEU-1004-71, GEU, Pre-Stent)

PreStent DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) inside (GEU-1004-71, GEU, Pre-Stent)
PreStent StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) inside (GEU-1004-71, GEU, Pre-Stent)
PreStent AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Section Area”) inside (GEU-1004-71, GEU, Pre-Stent)
PreStent StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) inside (GEU-1004-71, GEU, Pre-Stent)
PostStent AP	(M-02550, SRT, “Vessel Diameter”) with Measurement Label (122675, DCM, “Anterior-Posterior”) inside (GEU-1004-72, GEU, Post-Stent)
PostStent Trans	(M-02550, SRT, “Stent”) with Measurement Label (G-A117, SRT, “Transverse”) inside (GEU-1004-72, GEU, Post-Stent)
PostStent DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) inside (GEU-1004-72, GEU, Post-Stent)
PostStent StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) inside (GEU-1004-72, GEU, Post-Stent)
PostStent AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Section Area”) inside (GEU-1004-72, GEU, Post-Stent)
PostStent StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) inside (GEU-1004-72, GEU, Post-Stent)
AortaAP	(M-02550, SRT, “Aorta Diameter”) with Measurement Label (122675, DCM, “Anterior-Posterior”) inside (T-42000, SRT, Aorta)
AortaTrans	(M-02550, SRT, “Aorta Diameter”) with Measurement Label (G-A117, SRT, “Transverse”) inside (T-42000, SRT, Aorta)
Aorta Sagittal	(M-02550, SRT, “Aorta Diameter”) with Measurement Label (G-A117, SRT, “Sagittal”) inside (T-42000, SRT, Aorta)
IIA DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) inside (T-46740, SRT, Internal Iliac Artery)
IIA StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) inside (T-46740, SRT, Internal Iliac Artery)
IIA AreaStenA1/A2	(G-0366, SRT, “Vessel Lumen Cross-Section Area”) inside (T-46740, SRT, Internal Iliac Artery)
IIA StenosisA	(R-101BA, SRT, “Lumen Area Stenosis”) inside (T-46740, SRT, Internal Iliac Artery)
SpleenDistL	(G-A22A, SRT, Spleen Length) Inside (T-C3000, SRT, Spleen)
SpleenDistH	(121207, DCM, Spleen Height) Inside (T-C3000, SRT, Spleen)
SpleenDistW	(G-A220, SRT, Spleen Width) Inside (T-C3000, SRT, Spleen)
SpleenVolume	(G-D705, SRT, Spleen Volume) Inside (T-C3000, SRT, Spleen)
Aorta DiamStenD1/D2	(G-0364, SRT, “Vessel Lumen Diameter”) inside (T-42000, SRT, Aorta)
Aorta StenosisD	(R-101BB, SRT, “Lumen Diameter Stenosis”) inside (T-42000, SRT, Aorta)

AortaStenA1/A2	(G-0366, SRT, "Vessel Lumen Cross-Section Area") inside (T-42000, SRT, Aorta)
Aorta StenosisA	(R-101BA, SRT, "Lumen Area Stenosis") inside (T-42000, SRT, Aorta)

TABLE 15.10.3 ABDOMEN B-MODE MEASUREMENTS

15.11 DERIVATION AND SELECTION

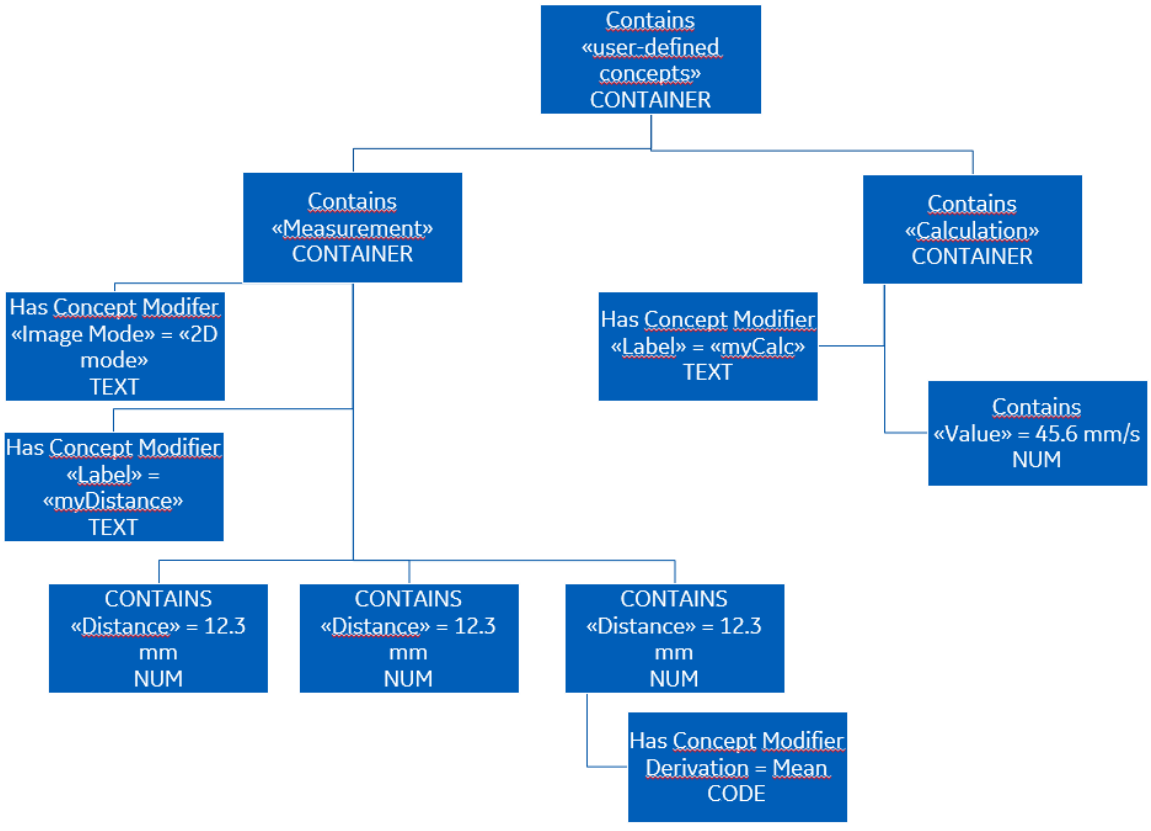
GEU Name	Derivation	Selection
Av	Mean	User chosen value
Mx	Maximum	User chosen value
Mn	Minimum	User chosen value
Lt	Most recent value chosen	User chosen value
* (decided by another parameter)	Best Value	User chosen value

16. DICOM STRUCTURE REPORTS – USER DEFINED OBJECTS

The Vivid Ultrasound Scanner and EchoPAC provide the operator the ability to define measurements and export them in a manner compliant with established DICOM templates. This functionality is defined explicitly within the user manual for the Vivid scanner and EchoPAC application. Please consult the User Manual for more details and how to use this functionality.

16.1 GE DEFAULT DICOM EXPORT FORMAT

The GE Vivid Ultrasound Scanner and EchoPAC application allow the user to define measurements without specifying codes or meanings for the measurements. This default value is used when creating a user defined measurement within the Measurement menu. The measurements defined in this manner use a common structure.
Example of a user defined measurement format:



16.2 TEMPLATE EXTENSIONS

16.2.1 TID5100: Vascular Ultrasound Report Extensions

	NL	Rel with Parent	VT	Concept Name	VM	Reg Type	Condition	Value Set Constraint
...	…	…	...	...	...	...	…	…
12	>	CONTAINS	INCLUDES	TID(9900) User-defined concepts	1	U		

16.2.2 TID5200: Adult Echo Template Report Extensions

	NL	Rel with Parent	VT	Concept Name	VM	Reg Type	Condition	Value Set Constraint
...	…	…	...	...	...	...	…	…
31	>	CONTAINS	INCLUDES	TID(9900) User-defined concepts	1	U		

16.2.3 TID5220: Pediatric Template Report Extensions

	NL	Rel with Parent	VT	Concept Name	VM	Reg Type	Condition	Value Set Constraint
...	…	…	...	...	...	...	…	…
31	>	CONTAINS	INCLUDES	TID(9900) User-defined concepts	1	U		

16.2.4 TID9900: User-defined concepts

	NL	Rel with Parent	VT	Concept Name	VM	Reg Type	Condition	Value Set Constraint
1			CONTAINER	DT(T9900-01, 99GEMS, “User-defined concepts”)	1	M		
2	>	CONTAINS	INCLUDE	TID(9901) User-defined concept	1-n	MC	One of row 2 and 3 must be present	$Type = DT (T9900-02, 99GEMS, “Measurement”)
3	>	CONTAINS	INCLUDE	TID(9901) User-defined concept	1-n	MC	One of row 2 and 3 must be present	$Type = DT (T9900-03, 99GEMS, “Calculation”)

16.2.5 TID9901: User-defined concept

	NL	Rel with Parent	VT	Concept Name	VM	Reg Type	Condition	Value Set Constraint
1			CONTAINER	$Type	1	M		
2	>	HAS CONCEPT MOD	TEXT	DT(T9900-04,99GEMS, “Label”)	1	M		
3	>	CONTAINS	INCLUDE	TID (300)	1	1-n	IFF $Type = “Measurement”	$Measurement = DCID (99008) Results $Derivation – (3627) Measurement Type
4	>	CONTAINS	INCLUDE	TID (300)	1	1	IFF $Type = “Calculation”	$Measurement = DT(T9900-05, 99GEMS, “Value”)
5	>	INFERRED FROM	TEXT	DCID(228)	1	U		

16.3 USER DEFINED DICOM MAPPINGS

The Vivid Ultrasound Scanner and EchoPAC application do allow for more specific DICOM mappings for user defined measurements.
Within the DICOM Mapping configuration Interface, the user will be presented with the Category and Parameter to map. The desired measurement must be chosen from these two fields to initiate the mapping process.
When defining the measurement in the Mappings Interface, the user is required to specify the following DICOM fields:

- Finding Site
- Coding Scheme Value
- Coding Scheme Designator
- Coding Scheme Meaning

There are other DICOM attributes available within the Mapping Interface which are optional to define. If defined, they may help describe the measurement more accurately. These include:

- View
- Phase
- Method
- Target
- Direction
- Respiratory Cycle Point

The values defined for the measurement will be presented to the user within a DICOM Encoding dialogue box within the DICOM Mapping configuration page. This visual representation shows the DICOM fields mapped when exporting the user defined object within the DICOM Structured Report.

17. SECURITY

17.1 INTRODUCTION

The security section describes security features implemented by this product. It includes description of non-DICOM network protocols, information to configure firewalls and application whitelists, list of supported DICOM security profiles as well as Web Security features. Additionally, secured media storage, VPN, etc. are also specified in this security section.

17.2 EXTERNAL NETWORK REQUIREMENTS

TABLE 17.2.1
EXTERNAL NETWORK REQUIREMENTS

Profile	Actor	Transaction	Protocol Used	RFCs	Security support	Reference
Basic Network Address Management	DHCP Client	Find and Use DHCP Server	DHCP	RFC2131 RFC2132 RFC2563		C.1.2
		Maintain Lease	DHCP	RFC2131 RFC2132		C.1.2
	DNS Client	Resolve Hostname	DNS	RFC1035 RFC2181		C.1.2
Application Configuration Management	LDAP Client	Find LDAP Server	LDAP	RFC2181 RFC2219 RFC2782		C.1.3
		Query LDAP Server	LDAP	RFC2251		C.1.3

17.3 TCP PORT CONFIGURATION

Ports and firewall configuration needed for interconnections supported by the Vivid scanner are described in Vivid™ Ultrasound Systems and EchoPAC™ Privacy and Security Manual - GD092163-1EN.

17.4 DICOM® Security PROFILE AVAILABILITY

17.4.1 Secure Use and User Identity Profiles

TABLE 17.4.1
SECURE USE AND USER IDENTITY PROFILES

Profile	Creator/Sender	Consumer/Receiver	Reference

Online Electronic Storage Secure Use	N	N	C.2.1
Audit Trail Message Format	N	N	C.2.2
Audit Trail Message Transmission Profile - SYSLOG-TLS	N	N	C.2.3
Audit Trail Message Transmission Profile - SYSLOG-UDP	N	N	C.2.4
Basic User Identity Association	N	N	8.5
User Identity Plus Passcode Association	N	N	8.5
Kerberos Identity Negotiation Association	N	N	8.5
Generic SAML Assertion Identity Negotiation Association	N	N	8.5

17.4.2 Secure Transport Connection Profiles

TABLE 17.4.2
SECURE TRANSPORT CONNECTION PROFILES

Profile	Creator/Sender	Consumer/Receiver	Reference
BCP195 TLS Secure Transport Connection	Y	N	C.2.5
Non-Downgrading BCP195 TLS Secure Transport Connection	N	N	C.2.5
CRYPTREC TLS	N	N	C.2.5

17.4.3 Media Storage Security Profiles

Not Applicable.

17.4.4 Digital Signature Profiles

Not Applicable.

17.4.5 Additional DICOM® Security Profiles supported

Not Applicable.

17.5 USER IDENTITY NEGOTIATION SUPPORTED

Not Applicable.

17.6 WEB SERVICES SECURITY FEATURES

Not Applicable.

17.7 ADDITIONAL SECURITY FEATURES

Not Applicable.

17.7.1 Media storage security

Not Applicable.

17.7.2 Network security

Not Applicable.

17.7.3 Other security features

The Vivid system has multiple layers of security controls, including the following:

- user authentication with configurable user and password policies
- application whitelisting
- OS hardening
- embedded firewall
- encryption of patient data stored on the system.

See Vivid™ Ultrasound Systems and EchoPAC™ Privacy and Security Manual - GD092163-1EN for more details.

APPENDICES

A. Information Object Definitions (IODs)

This section provides the detailed content of the IODs natively created by the Vivid scanner, EchoPAC Software Only and EchoPAC Plug-in application, e.g., images created by an acquisition modality or evidence documents created on a review workstation application.

Throughout the tables listed in Annex A the following codes are used for the Source and Presence columns.

In the Source Column, the following values are supported:

FIXED: the value is pre-defined and cannot be modified.
GENERATED: the value is generated by the system.
CONFIGURATION: the value is copied from system configuration.
MWL: the value is copied from modality worklist.
USER: the value is entered by the user.
SCANNED: the value is read from a barcode scanner or similar device.
EMPTY: the attribute is sent without value.
SRC_INSTANCE: the value is copied from previously created instances.

The Presence columns reflect the usage of the module, functional group macro, attributes or value in the Vivid scanner and EchoPAC Software Only application implementation and is not necessarily the same as defined in the DICOM standard. For the Presence column the following values are supported:

ALWAYS: the module, functional group macro, attributes or value is always present
CONDITIONAL: the presence of the module, functional group macro, attributes or value is dependent on a condition. The condition must be listed in the Conditions column
EMPTY: The attribute is present but without a value (zero length)

A.1 Information Shared across multiple IODs

A.1.1 Shared Modules

All IODs generated by the system use the following common modules or a subset of them, as defined in the IOD specific subsections below.

TABLE A.1.1
SHARED MODULES

Attribute Name	Tag	Source	Presence (Attribute)	Presence (Value)	Value	Conditions	Comment
Patient							
Referenced Patient Sequence	(0008,1120)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there. Not used in SR	

						Documents .	
>Referenced SOP Class UID	(0008,1150)	MWL	ALWAYS	CONDITIONAL		Taken from worklist if it is there.	Not used in SR Documents
>Referenced SOP Instance UID	(0008,1155)	MWL	ALWAYS	CONDITIONAL		Taken from worklist if it is there.	Not used in SR Documents
Patient's Name	(0010,0010)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
Patient ID	(0010,0020)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
Issuer of Patient ID	(0010,0021)	MWL	ALWAYS	CONDITIONAL		Taken from worklist if it is there.	
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Universal Entity ID	(0040,0032)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Universal Entity ID Type	(0040,0033)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Identifier Type Code	(0040,0035)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
Patient's Birth Date	(0010,0030)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
Patient's Birth Time	(0010,0032)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface.	

						Taken from worklist if it is there.	
Patient's Sex	(0010,0040)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
Other Patient IDs	(0010,1000)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
Other Patient IDs Sequence	(0010,1002)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
>Patient ID	(0010,0020)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
>Issuer of Patient ID	(0010,0021)	MWL	CONDITIONAL	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
>Type of Patient ID	(0010,0022)	FIXED	ALWAYS	"TEXT"			
>Issuer of Patient ID Qualifiers Sequence	(0010,0024)	MWL	CONDITIONAL	ALWAYS		Taken from worklist if it is there.	
>>Universal Entity ID	(0040,0032)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>>Universal Entity ID Type	(0040,0033)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	

>>Identifier Type Code	(0040,0035)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
Ethnic Group	(0010,2160)	MWL	ALWAYS	CONDITIONAL		Taken from worklist if it is there.	
Patient Comments	(0010,4000)	MWL	ALWAYS	CONDITIONAL		Taken from worklist if it is there.	
Patient Identity Removed	(0012,0062)	GENERATED	CONDITIONAL	CONDITIONAL		Present and set to "YES" if patient is anonymized.	
De-identification Method	(0012,0063)	GENERATED	CONDITIONAL	CONDITIONAL		Present and set to "GEVU anonymization" if patient is anonymized.	
General Study							
Study Date	(0008,0020)	GENERATED	ALWAYS	ALWAYS			Is set to examination date
Study Time	(0008,0030)	GENERATED	ALWAYS	ALWAYS			Is set to examination time
Accession Number	(0008,0050)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
Referring Physician's Name	(0008,0090)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
Study Description	(0008,1030)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there	

						(from Requested Procedure Description).	
Physician(s) of Record	(0008,1048)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there (from Names of Intended Recipients of Result)	Not used in SR Documents
Referenced Study Sequence	(0008,1110)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there. Not used in SR Documents .	
>Referenced SOP Class UID	(0008,1150)	MWL	ALWAYS	CONDITIONAL		Taken from worklist if it is there.	
>Referenced SOP Instance UID	(0008,1155)	MWL	ALWAYS	CONDITIONAL		Taken from worklist if it is there.	
Study Instance UID	(0020,000D)	GENERATED/MWL	ALWAYS	CONDITIONAL		Uniquely generated by the equipment. Taken from worklist if it is there.	
Study ID	(0020,0010)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there (from Requested Procedure Id)	
Patient Study							
Patient's Size	(0010,1020)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	

Patient's Weight	(0010,1030)	USER/MWL	ALWAYS	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there.	
Additional Patient History	(0010,21B0)	USER/MWL	CONDITIONAL	CONDITIONAL		May be entered from User Interface (in Referral reason). Taken from worklist if it is there.	
Admission ID	(0038,0010)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
General Series							
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			Is set to Series date
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			Is set to Series time
Modality	(0008,0060)	GENERATED	ALWAYS	ALWAYS	"US" or "SR"		
Series Description	(0008,103E)	USER	ALWAYS	CONDITIONAL		May be entered from User Interface (in Diagnosis).	
Performing Physician's Name	(0008,1050)	USER/MWL	CONDITIONAL	CONDITIONAL		May be entered from User Interface. Taken from worklist if it is there (from Scheduled Performing Physician's Name)	
Operators' Name	(0008,1070)	USER/ CONFIGURATION	ALWAYS	CONDITIONAL		May be entered from User Interface. Default is login id.	
Referenced Performed	(0008,1111)	SRC_INSTANCE	CONDITIONAL	ALWAYS		Used if Modality	

Procedure Step Sequence						Performed Procedure Step is enabled.	
>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS		Used if Modality Performed Procedure Step is enabled.	
>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS		Used if Modality Performed Procedure Step is enabled.	
Protocol Name	(0018,1030)	CONFIGURATIO N	CONDITIONAL	CONDITIONAL		Sent if the image is acquired in a stress protocol.	
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS			Uniquely generated by the equipment
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS			Internal number which is incremented for each new series within a study.
Request Attributes Sequence	(0040,0275)		ALWAYS	ALWAYS			
>Accession Number	(0008,0050)	USER/MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Referenced Study Sequence	(0008,1110)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Study Instance UID	(0020,000D)	GENERATED/ MWL	ALWAYS	ALWAYS		Taken from worklist if it is there.	
>Requested Procedure Description	(0032,1060)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Requested Procedure Code Sequence	(0032,1064)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Scheduled Procedure Step Description	(0040,0007)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	

>Scheduled Protocol Code Sequence	(0040,0008)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Scheduled Procedure Step ID	(0040,0009)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
>Requested Procedure ID	(0040,1001)	MWL	CONDITIONAL	CONDITIONAL		Taken from worklist if it is there.	
Performed Procedure Step Start Date	(0040,0244)	GENERATED	CONDITIONAL	CONDITIONAL		Used if Modality Performed Procedure Step is enabled.	
Performed Procedure Step Start Time	(0040,0245)	GENERATED	CONDITIONAL	CONDITIONAL		Used if Modality Performed Procedure Step is enabled.	
Performed Procedure Step ID	(0040,0253)	GENERATED	CONDITIONAL	CONDITIONAL		Used if Modality Performed Procedure Step is enabled.	
Performed Procedure Step Description	(0040,0254)	GENERATED	CONDITIONAL	CONDITIONAL		Used if Modality Performed Procedure Step is enabled.	
Performed Protocol Code Sequence	(0040,0260)	MWL/CONFIGURATION	CONDITIONAL	CONDITIONAL		Taken from worklist or selected protocol.	
General Equipment							
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	See Table A.1.3		
Institution Name	(0008,0080)	CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if the configured value is not empty.	
Station Name	(0008,1010)	CONFIGURATION	ALWAYS	ALWAYS			
Institutional Department Name	(0008,1040)	USER/ CONFIGURATION	CONDITIONAL	CONDITIONAL		The default value is the configured Departmen t name.	

						May be overridden by the value entered in the Patient info screen.	
Manufacturer's Model Name	(0008,1090)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
Device Serial Number	(0018,1000)	GENERATED	ALWAYS	ALWAYS		The value is the serial number of the scanner. Not used in EchoPAC	
Software Versions	(0018,1020)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
General Image							
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS			Set from Image date.
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			Set from Image time.
Image Type	(0008,0008)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
Acquisition DateTime	(0008,002A)	GENERATED	ALWAYS	ALWAYS			
Referenced Image Sequence	(0008,1140)	GENERATED	CONDITIONAL	CONDITIONAL		Written if the content of the object has been created based on other object(s)	
>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			
Derivation Description	(0008,2111)	GENERATED	CONDITIONAL	CONDITIONAL		May be written and contain additional derivation informatio n if the Image Type is DERIVED.	

Source Image Sequence	(0008,2112)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Used if the image is derived from another image	
>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			May be used for source images.
>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			May be used for source images.
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS			Internal value which is incremented for each image within a series.
Patient Orientation	(0020,0020)	FIXED	ALWAYS	ALWAYS	EMPTY		
Image Comments	(0020,4000)	GENERATED	CONDITIONAL	CONDITIONAL		Sent if the image is acquired in a stress protocol.	
Burned In Annotation	(0028,0301)	FIXED	CONDITIONAL	ALWAYS	YES	Only sent if the image contains burned in annotations	
Lossy Image Compression	(0028,2110)	GENERATED	CONDITIONAL	ALWAYS	01	If the image is lossy compressed	
					00	Otherwise	
Lossy Image Compression Ratio	(0028,2112)	GENERATED	CONDITIONAL	ALWAYS		Only sent if the image is lossy compressed	
Image Pixel							
Samples per Pixel	(0028,0002)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
Photometric Interpretation	(0028,0004)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
Rows	(0028,0010)	GENERATED	ALWAYS	ALWAYS			Value depends on scanning mode and configuration setup.

Columns	(0028,0011)	GENERATED	ALWAYS	ALWAYS			Value depends on scanning mode and configuration setup.
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	8		
Bits Stored	(0028,0101)	FIXED	ALWAYS	ALWAYS	8		
High Bit	(0028,0102)	FIXED	ALWAYS	ALWAYS	7		
Pixel Representation	(0028,0103)	FIXED	ALWAYS	ALWAYS	0		0 – unsigned integer
Planar Configuration	(0028,0006)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
Red Palette Color Lookup Table Descriptor	(0028,1101)	GENERATED	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Green Palette Color Lookup Table Descriptor	(0028,1102)	GENERATED	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Blue Palette Color Lookup Table Descriptor	(0028,1103)	GENERATED	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Red Palette Color Lookup Table Data	(0028,1201)	GENERATED	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Green Palette Color Lookup Table Data	(0028,1202)	GENERATED	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Blue Palette Color Lookup Table Data	(0028,1203)	GENERATED	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Pixel Data	(7FE0,0010)	GENERATED	ALWAYS	ALWAYS			Pixel Data of image.
Palette Color Lookup Table							
Red Palette Color Lookup Table Descriptor	(0028,1101)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	

Green Palette Color Lookup Table Descriptor	(0028,1102)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Blue Palette Color Lookup Table Descriptor	(0028,1103)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Red Palette Color Lookup Table Data	(0028,1201)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Green Palette Color Lookup Table Data	(0028,1202)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
Blue Palette Color Lookup Table Data	(0028,1203)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading Palette images.	
US Region Calibration							
Sequence of Ultrasound Regions	(0018,6011)	GENERATED	ALWAYS	ALWAYS			
>Region Spatial Format	(0018,6012)	GENERATED	ALWAYS	ALWAYS			
>Region Data Type	(0018,6014)	GENERATED	ALWAYS	ALWAYS			
>Region Flags	(0018,6016)	GENERATED	ALWAYS	ALWAYS	Bit 0: 0 (Opaque) Bit 1: 0 (Not Protected because there may be other regions within the image) Bit 2: 0 (Velocity)		
>Region Location Min X0	(0018,6018)	GENERATED	ALWAYS	ALWAYS			Varies with scanning mode.
>Region Location Min Y0	(0018,601A)	GENERATED	ALWAYS	ALWAYS			Varies with scanning mode.
>Region Location Max X1	(0018,601C)	GENERATED	ALWAYS	ALWAYS			Value is image width-1.

>Region Location Max Y1	(0018,601E)	GENERATED	ALWAYS	ALWAYS			Value is image height-1.
>Reference Pixel X0	(0018,6020)	GENERATED	CONDITIONAL	ALWAYS		Varies with scanning mode.	
>Reference Pixel Y0	(0018,6022)	GENERATED	CONDITIONAL	ALWAYS		Varies with scanning mode.	
>Physical Units X Direction	(0018,6024)	GENERATED	ALWAYS	ALWAYS			Values supported: 3 (cm) 4 (seconds)
>Physical Units Y Direction	(0018,6026)	GENERATED	ALWAYS	ALWAYS			Values supported: 3 (cm) 4 (seconds) 7 (cm/sec)
>Reference Pixel Physical Value X	(0018,6028)	GENERATED	CONDITIONAL	ALWAYS		Varies with scanning mode.	
>Reference Pixel Physical Value Y	(0018,602A)	GENERATED	CONDITIONAL	ALWAYS		Varies with scanning mode.	
>Physical Delta X	(0018,602C)	GENERATED	ALWAYS	ALWAYS			Varies with scanning mode.
>Physical Delta Y	(0018,602E)	GENERATED	ALWAYS	ALWAYS			Varies with scanning mode.
>Transducer Frequency	(0018,6030)	GENERATED	CONDITIONAL	ALWAYS		Sent if relevant for the image	
>Pulse Repetition Frequency	(0018,6032)	GENERATED	CONDITIONAL	ALWAYS		Sent if relevant for the image	
>Pixel Component Organization	(0018,6044)	GENERATED	CONDITIONAL	ALWAYS		Pixel component calibration data does not exist for any region.	
US Image							
Image Type	(0008,0008)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
Stage Name	(0008,2120)	USER/CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if image is acquired in	Name of stage of stress test.

						a stress test.	
Stage Number	(0008,2122)	USER/CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if image is acquired in a stress test.	The stress test stage number when acquiring the image; starting at value 1.
Number of Stages	(0008,2124)	USER/CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if image is acquired in a stress test.	
View Name	(0008,2127)	USER/CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if image is acquired in a stress test.	The stress test view name when acquiring the image. The name is defined in the User Interface.
View Number	(0008,2128)	USER/CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if image is acquired in a stress test.	The stress test view number when acquiring the image; starting at value 1.
Number of Event Timers	(0008,2129)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading images.	
Number of Views in Stage	(0008,212A)	USER/CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if image is acquired in a stress test.	
Event Elapsed Time(s)	(0008,2130)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading images.	
Event Timer Name(s)	(0008,2132)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only used when reading images.	
Heart Rate	(0018,1088)	GENERATED	ALWAYS	ALWAYS			Set to the detected heart rate.
R Wave Time Vector	(0018,6060)	GENERATED	CONDITIONAL	CONDITIONAL		Used if relevant for the image	May be filled in with timing information.
Samples per Pixel	(0028,0002)	GENERATED	ALWAYS	ALWAYS	See		

					Table A.1.3		
Photometric Interpretation	(0028,0004)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
Planar Configuration	(0028,0006)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
Frame Increment Pointer	(0028,0009)	GENERATED	CONDITIONAL	CONDITIONAL			
Ultrasound Color Data Present	(0028,0014)	GENERATED	ALWAYS	ALWAYS			
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	8		
Bits Stored	(0028,0101)	FIXED	ALWAYS	ALWAYS	8		
High Bit	(0028,0102)	FIXED	ALWAYS	ALWAYS	7		
Pixel Representation	(0028,0103)	FIXED	ALWAYS	ALWAYS	0		
Lossy Image Compression	(0028,2110)	GENERATED	ALWAYS	CONDITIONAL		Set to 1 if the image is compressed using JPEG Baseline compression. Otherwise, set to 0.	
Stage Code Sequence	(0040,000A)	USER/CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if image is acquired in a stress test.	Coded stage name of stress test. The name is defined in the User Interface.
View Code Sequence	(0054,0220)	USER/CONFIGURATION	CONDITIONAL	CONDITIONAL		Sent if the image is acquired in a stress test.	The coded view name of the stress test. The name is defined in the User Interface.
VOI LUT							
Window Center	(0028,1050)	FIXED	CONDITIONAL	CONDITIONAL	Value set to 127 if Photometric Interpretation has value MONOCHROME2	Only used for images created from CT data.	
Window Width	(0028,1051)	FIXED	CONDITIONAL	CONDITIONAL	Value set to 256 if Photometric Interpretation has value MONOCHROME2.	Only used for images created from CT data.	
SOP Common							

SOP Class UID	(0008,0016)	GENERATED	ALWAYS	ALWAYS	See Table A.1.3		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS			Uniquely generated by the equipment.

A.1.2 Common Functional Group Macros

N/A

A.1.3 Shared Private Modules

Table A.1.2 lists private attributes that are used in multiple IODs generated by the system. For documentation convenience and readability, they are organized in modules, although the concept of modules does not exist in the standard for private attributes.

TABLE A.1.2
SHARED PRIVATE MODULES

Attribute Name	Tag	VR	VM	Con-tains PHI	Presence (Attribute)	Presence (Value)	Value	Conditions	Description
GEMS_Ultrasound_MovieGroup_001									
Private Creator	7FE1,00xx	LO	1	No	CONDITIONAL	ALWAYS	GEMS_Ultrasound_MovieGroup_001	Used in DICOM US modality objects if Allow Raw Data is enabled	If so configured, the product will send ultrasound raw data information in private data elements designated by this Private Creator element. All private tags starting with 7FE1,xx will belong to the GEMS_Ultrasound_MovieGroup_001.
GEMS_Ultrasound_ImageGroup_001									
Private Creator	6003,00xx	LO	1	Yes	CONDITIONAL	ALWAYS	GEMS_Ultrasound_ImageGroup_001	Used in DICOM US modality objects	The product will include ultrasound preview image in private data elements designated by the Private Creator element.

Attribute Name	Tag	VR	VM	Con-tains PHI	Presence (Attribute)	Presence (Value)	Value	Conditions	Description
									All private tags starting with 6003,xx will belong to the GEMS_Ultrasound_ImageGroup_001.
GEMS_Ultrasound_ExamGroup_001									
Private Creator	6005,00xx	LO	1	Yes	CONDITIONAL	ALWAYS	GEMS_Ultrasound_ExamGroup_001	Used in DICOM SR modality objects with Allow Private Data enabled	The product will send exam information in private data elements designated by the Private Creator element All private tags starting with 6005,00xx will belong to the GEMS_Ultrasound_ExamGroup_001.

A.1.4 Shared Values and Code Sets

The following Shared Values and Code Sets are used in multiple IODs generated by the system.

TABLE A.1.3
SHARED VALUES AND CODE SETS

Attribute Name	Tag	Value/Code	Condition	Comments
Image Type	(0008,0008)	The first two values contain "ORIGINAL\PRIMARY" or "DERIVED\PRIMARY". Value 3 is always empty. Value 4 is a description of the mode. Values beyond this may be used for private data.		
Manufacturer	(0008,0070)	GE Vingmed Ultrasound		
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.3.1	Ultrasound Multiframe Image Storage	
		1.2.840.10008.5.1.4.1.1.3	Ultrasound Multiframe Image Storage (retired)	

		1.2.840.10008.5.1.4.1.1.6.1	Ultrasound Image Storage	
		1.2.840.10008.5.1.4.1.1.6	Ultrasound Image Storage (retired)	
		1.2.840.10008.5.1.4.1.1.7	Secondary Capture Image Storage	
		1.2.840.10008.5.1.4.1.1.88.33	Comprehensive SR	
Manufacturer's Model Name	(0008,1090)	Vivid E80	Based on the product, the value is set to any of these	
		Vivid E90		
		Vivid E95		
		Vivid iq		
		Vivid S60		
		Vivid S70		
		Vivid T8		
		Vivid T9		
		EchoPAC		
		EchoPAC PC Integrated		
Software Versions	(0018,1020)	<Model Name>:206.<x>	The <Model Name> has the same value as element (0008,1090), whereas <x> denotes the current minor/patch/build version of the SW.	
Samples per Pixel	(0028,0002)	1	If the Photometric Interpretation element value is any of: • MONOCHROME 2 • PALETTE COLOR (only for read)	
		3	If the Photometric Interpretation element value is any of: • RGB • YBR_FULL • YBR_FULL_422	
Photometric Interpretation	(0028,0004)	MONOCHROME2	Grayscale Images	
		RGB	When compression is any of: • None • JPEG Lossless	
		YBR_FULL	When compression is: • RLE	
		YBR_FULL_422	When compression is:	

			• JPEG Lossy	
		PALETTE COLOR	Only supported for read	
Planar Configuration	(0028,0006)	0 (color by pixel)	When the Photometric Interpretation element value is any of: • RGB • YBR_FULL_422	
		1 (color by plane)	When the Photometric Interpretation element value is: • YBR_FULL	

A.2 Ultrasound Image IOD

The following table defines the structure of Ultrasound Image IOD.

TABLE A.2.1
ULTRASOUND IMAGE IOD MODULES

Module Name	Presence (Module)	Condition	Reference
Patient	ALWAYS		Table A.1.1
General Study	ALWAYS		Table A.1.1
Patient Study	ALWAYS		Table A.1.1
General Series	ALWAYS		Table A.1.1
General Equipment	ALWAYS		Table A.1.1
General Image	ALWAYS		Table A.1.1
Image Pixel	ALWAYS		Table A.1.1
Contrast/Bolus	CONDITIONAL	Only used when filled in by the user	Table A.2.1
Palette Color Lookup Table	CONDITIONAL	Only used when reading Palette images.	Table A.1.1
US Region Calibration	CONDITIONAL	Only used when the characteristics of the image (depth, scale, etc.) are constant throughout the whole recording interval.	Table A.1.1
US Image	ALWAYS		Table A.1.1
VOI LUT	CONDITIONAL	Only used for images created from CT data.	Table A.1.1
SOP Common	ALWAYS		Table A.1.1

A.2.1 Ultrasound Image IOD Specific Modules

See Table A.1.1
Shared modules". None of the modules are specific to the Ultrasound Image IOD.

A.2.2 Ultrasound Image IOD Specific Functional Group Macros

N/A

A.2.3 Ultrasound Image IOD Specific Private Modules

N/A

A.2.4 Ultrasound Image IOD Specific Values and Code Sets

N/A

A.3 Ultrasound Multi-frame Image IOD

The following table defines the structure of Ultrasound Multi-frame Image IOD.

TABLE A.3.1
ULTRASOUND MULTI-FRAME IMAGE IOD

Module Name	Presence (Module)	Condition	Reference
Patient	ALWAYS		Table A.1.1
General Study	ALWAYS		Table A.1.1
Patient Study	ALWAYS		Table A.1.1
General Series	ALWAYS		Table A.1.1
General Equipment	ALWAYS		Table A.1.1
General Image	ALWAYS		Table A.1.1
Image Pixel	ALWAYS		Table A.1.1
Contrast/Bolus	CONDITIONAL	Only used when filled in by the user	Table A.1.1
Cine	ALWAYS		Table A.3.2
Multi-frame	ALWAYS		Table A.3.2
Palette Color Lookup Table	CONDITIONAL	Only used when reading Palette images	Table A.1.1
US Region Calibration	CONDITIONAL	Only used when the characteristics of the image (depth, scale, etc.) are constant throughout the whole recording interval.	Table A.1.1
US Image	ALWAYS		Table A.1.1
VOI LUT	CONDITIONAL	Only used for images created from CT data.	Table A.1.1
SOP Common	ALWAYS		Table A.1.1

A.3.1 Ultrasound Multi-frame Image IOD Specific Modules

TABLE A.3.2
ULTRASOUND MULTI-FRAME IMAGE IOD SPECIFIC MODULES

Attribute Name	Tag	Source	Presence (Attribute)	Presence (Value)	Value	Conditions	Comment
Cine							
Start Trim	(0008,2142)	GENERATED	ALWAYS	ALWAYS			
Stop Trim	(0008,2143)	GENERATED	ALWAYS	ALWAYS			
Recommended Display Frame Rate	(0008,2144)	GENERATED	ALWAYS	ALWAYS			
Cine Rate	(0018,0040)	GENERATED	ALWAYS	ALWAYS			
Effective Duration	(0018,0072)	GENERATED	ALWAYS	ALWAYS			
Frame Time	(0018,1063)	GENERATED	ALWAYS	ALWAYS			Is set to the interframe time
Frame Time Vector	(0018,1065)	SRC_INSTANCE	CONDITIONAL	CONDITIONAL		Only reading is supported.	The average frame time is calculated and written to the Frame Time attribute.
Frame Delay	(0018,1066)	GENERATED	ALWAYS	ALWAYS			
Actual Frame Duration	(0018,1242)	GENERATED	ALWAYS	ALWAYS			
Preferred Playback Sequencing	(0018,1244)	FIXED	ALWAYS	ALWAYS	0 (looping)		
Multiframe							
Number of Frames	(0028,0008)	GENERATED	ALWAYS	ALWAYS			Is set to the number of frames in image
Frame Increment Pointer	(0028,0009)	GENERATED	ALWAYS	ALWAYS			Is set to Frame Time (0018,1063) or Frame Time Vector (0018,1065)

A.3.2 Ultrasound Multi-frame Image IOD Specific Functional Group Macros

N/A