DICOM Correction Proposal

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Correction Number CP-1813
Log Summary: Add concept of Toric Intraocular Lenses to Intraocular Lens Calculations IOD
Name of Standard PS3.3, PS3.6 2018a
Rationale for Correction: The Intraocular Lens Calculations IOD defines attributes to encode calculation results for intraocular lenses (IOLs). However, the IOD as is provides only means for specifying intraocular lenses with a spherical correction. IOLs with toric correction features, which became popular in cataract surgery in the last years to also decrease post-operative astigmatism, are currently not covered by the IOD definitions. In contrast to spherical IOLS, where refractive power is the same for all meridians, toric IOLs have different powers in different meridians of the lens to correct the asymmetric power of the eye that is characteristic of astigmatism. The scope of this proposal is to add all attribute definitions needed for specification of toric IOL calculation results in the IOL IOD.
Correction Wording:

In PS3.3, section C.8.25.16.2 Intraocular Lens Calculations Macro add following attributes

C.8.25.16.2 Intraocular Lens Calculations Macro

Table C.8.25.16-2. Intraocular Lens Calculations Macro Attributes

Attribute Name	Tag	Type	Attribute Description
…	…	…	…
IOL Formula Detail	(0022,1029)	3	A free form text description of the of the IOL Formula Code Sequence (0022,1028) (e.g., a reference to the mathematical equation).
Include Table C.8.25.16-4 "IOL Ophthalmic Axial Length Macro Attributes"			
Surgically Induced Astigmatism Sequence	**(aaaa,aaaa)**	**3**	**The astigmatism that is expected to be induced by corneal incisions during cataract surgery.** **Only a single Item is permitted in this Sequence.**
>Cylinder Power	**(0046,0147)**	**1**	**The cylinder power, in diopters.**
>Cylinder Axis	**(0022,0009)**	**1**	**The cylinder axis, in degrees.**
Include Table C.8.25.16-5 "Calculated IOL Macro			

Attributes"	

In PS3.3, section C.8.25.16.5 Calculated IOL Macro add following attributes

C.8.25.16.5 Calculated IOL Macro

Table C.8.25.16-5. Calculated IOL Macro Attributes

Attribute Name	Tag	Type	Attribute Description
IOL Manufacturer	(0022,1093)	1	Name of the manufacturer that produced the lens.
Implant Name	(0022,1095)	1	The (product) name of the lens.
Type of Optical Correction	**(bbbb,bbbb)**	**3**	**Type of the optical correction achieved by the IOL.** **Enumerated Values:** **SPHERICAL** **TORIC**
Lens Constant Sequence	(0022,1092)	1	Constants used in calculation of intraocular lens power. These constants are a characteristic of the model of intraocular lens being considered for use in cataract surgery. One or more Items shall be included in this Sequence.
>Concept Name Code Sequence	(0040,A043)	1	Constant type used in calculation of intraocular lens power. Only a single Item shall be included in this Sequence.
>>Include Table 8.8-1 "Code Sequence Macro Attributes"			*Defined CID 4237 "Lens Constant Type"*
>Numeric Value	(0040,A30A)	1	The value of the constant used.
IOL Power Sequence	(0022,1090)	1	Information needed to select the intraocular lens power for cataract surgery. One or more Items shall be included in this Sequence.
>IOL Power	(0022,1053)	1	The intraocular lens power, in diopters. **If Type of Optical Correction (bbbb,bbbb) is TORIC, this value represents the spherical equivalent of the toric intraocular lens power.**
>Toric IOL Power Sequence	**(cccc,cccc)**	**1C**	**The toric intraocular lens power.** **Only a single Item shall be included in this Sequence.** **Required if Type of Optical Correction (bbbb,bbbb) is TORIC.**

>>Include Table C.8.25.16-n. "Calculated Toric Power Macro"			
>Predicted Refractive Error	(0022,1054)	1	The predicted postoperative refractive error (i.e., amount of near or far sightedness), in diopters. **If Type of Optical Correction (bbbb,bbbb) is TORIC, this value represents the spherical equivalent of the predicted toric error.**
>Predicted Toric Error Sequence	**(dddd,dddd)**	**1C**	**The predicted postoperative toric error.** **Only a single Item shall be included in this Sequence.** **Required if Type of Optical Correction (bbbb,bbbb) is TORIC.**
>>Include Table C.8.25.16-n. "Calculated Toric Power Macro"			
>Implant Part Number	(0022,1097)	2	The (product) identifier of the lens.
>Pre-Selected for Implantation	**(eeee,eeee)**	**3**	**Indicates, whether the intraocular lens specified by this sequence item has been pre-selected for implantation or not.** **Enumerated Values:** **YES** **NO** **Only one Item in IOL Power Sequence (0022,1090) shall contain the value YES.**
IOL Power for Exact Emmetropia	(0022,1121)	2	The IOL power that would be required to achieve exact emmetropia, or no need for glasses at distance after surgery, in diopters. **If Type of Optical Correction (bbbb,bbbb) is TORIC, this value represents the spherical equivalent of the toric intraocular lens power for exact emmetropia.**
Toric IOL Power for Exact Emmetropia Sequence	**(ffff,ffff)**	**2C**	**The toric IOL power that would be required to achieve exact emmetropia.** **Zero or one Item shall be included in this Sequence.** **Required if Type of Optical Correction (bbbb,bbbb) is TORIC.**
>Include Table C.8.25.16-n. "Calculated Toric Power Macro"			
IOL Power for Exact Target Refraction	(0022,1122)	2	The IOL power that would be required to exactly achieve Target Refraction (0022,1037), in diopters. **If Type of Optical Correction (bbbb,bbbb) is TORIC, this value represents the spherical**

			equivalent of the toric intraocular lens power for exact target refraction.
Toric IOL Power for Exact Target Refraction Sequence	**(gggg,gggg)**	**2C**	**The toric IOL power that would be required to exactly achieve Target Refraction (0022,1037).** **Zero or one Item shall be included in this Sequence.** **Required if Type of Optical Correction (bbbb,bbbb) is TORIC.**
>Include Table C.8.25.16-n. "Calculated Toric Power Macro"			

In PS3.3, section C.8.25.16 Intraocular Lens Calculations Module add following macro definition

C.8.25.16.n Calculated Toric Power Macro

Table C.8.25.16-n specifies and describes the attributes that identify the toric amount of calculated refractive power used in IOL calculation.

Table C.8.25.16-n. Calculated Toric Power Macro Attributes

Attribute Name	Tag	Type	Attribute Description
Sphere Power	**(0046,0146)**	**3**	**The calculated spherical power, in diopters.**
Cylinder Power	**(0046,0147)**	**1**	**The calculated cylinder power, in diopters.**
Cylinder Axis	**(0022,0009)**	**1**	**The calculated cylinder axis, in degrees.**

In PS 3.6, Section 6 add following attributes to Table 6-1. Registry of DICOM Data Elements

Tag	Name	Keyword	VR	VM
(aaaa,aaaa)	**Surgically Induced Astigmatism Sequence**	**SurgicallyInducedAstigmatismSequence**	**SQ**	**1**
(bbbb,bbbb)	**Type of Optical Correction**	**TypeOfOpticalCorrection**	**CS**	**1**
(cccc,cccc)	**Toric IOL Power Sequence**	**ToricIOLPowerSequence**	**SQ**	**1**
(dddd,dddd)	**Predicted Toric Error Sequence**	**PredictedToricErrorSequence**	**SQ**	**1**
(eeee,eeee)	**Pre-Selected for Implantation**	**PreSelectedForImplantation**	**CS**	**1**
(ffff,ffff)	**Toric IOL Power for Exact Emmetropia Sequence**	**ToricIOLPowerForExactEmmetropiaSequence**	**SQ**	**1**
(gggg,gggg)	**Toric IOL Power for Exact Target Refraction Sequence**	**ToricIOLPowerForExactTargetRefractionSequence**	**SQ**	**1**