

**American College of Radiology  
ACR Appropriateness Criteria®**

**Orbits, Vision and Visual Loss**

**Variant 1: Traumatic visual defect. Suspect orbital injury. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT orbits without IV contrast	Usually appropriate		☼☼☼ 1-10 mSv		9	9	0	0	0	1	0	0	0	2	14
CT head without IV contrast	Usually appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	7	7	0	1	0	0	3	3	10	2	0
MRI orbits without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	5	2	8	2	2	0
MRI head without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	1	3	1	2	12	0	0	0
MRI orbits without and with IV contrast	May be appropriate (Disagreement)		○ 0 mSv	○ 0 mSv [ped]	5	5	2	0	1	3	4	5	4	0	0
CT orbits with IV contrast	May be appropriate (Disagreement)		☼☼☼ 1-10 mSv		5	5	2	0	5	2	2	6	1	1	0
MRI head without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	5	5	2	1	4	1	10	1	0	0	0
CTA head and neck with IV contrast	May be appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	5	1	0	2	2	5	8	1	0	0
MRA head and neck without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	4	4	2	0	5	5	6	1	0	0	0

MRA head and neck without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	4	4	2	0	5	3	8	1	0	0	0
CT head with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	3	3	3	2	11	2	0	1	0	0	0
Arteriography cervicocerebral	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	3	3	8	1	9	0	1	0	0	0	0
Radiography orbit	Usually not appropriate		⊗ <0.1 mSv	⊗ <0.03 mSv [ped]	1	1	10	3	2	0	1	0	1	0	0
CT orbits without and with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv		1	1	10	1	6	2	0	0	0	0	0
CT head without and with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	10	3	6	0	0	0	0	0	0

**Variant 2: Nontraumatic orbital asymmetry, exophthalmos, or enophthalmos. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI orbits without and with IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	0	6	11
CT orbits with IV contrast	Usually appropriate		⊗⊗⊗ 1-10 mSv		8	8	0	0	0	0	0	1	6	5	5
CT orbits without IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv		6	6	0	0	0	1	2	6	1	3	4
CTA head and neck with IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	6	6	0	0	0	2	3	9	2	1	0
MRA head and neck without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	1	1	5	5	3	2	0

MRI head without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	1	0	1	6	11	0	0	0
MRI orbits without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	1	1	4	11	2	0	0
MRA head and neck without IV contrast	May be appropriate (Disagreement)		○ 0 mSv	○ 0 mSv [ped]	5	5	0	4	1	3	7	4	0	0	0
MRI head without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	5	5	2	0	0	6	6	5	0	0	0
Arteriography cervicocerebral	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	4	4	0	4	5	8	2	0	0	0	0
CT head with IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	4	4	0	3	0	10	5	1	0	0	0
CT head without IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	4	4	1	3	1	7	6	1	0	0	0
CT head without and with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	2	2	6	4	3	4	1	1	0	0	0
Radiography orbit	Usually not appropriate		⊗ <0.1 mSv	⊗ <0.03 mSv [ped]	1	1	16	0	0	0	1	0	0	0	0
CT orbits without and with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv		1	1	9	6	2	0	0	0	0	0	0

**Variant 3: Suspected orbital cellulitis, uveitis, or scleritis. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT orbits with IV contrast	Usually appropriate		⊗⊗⊗ 1-10 mSv		9	9	0	0	0	0	0	1	4	0	12

MRI orbits without and with IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	8	8	0	0	0	0	0	0	2	10	5
CT orbits without IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv		6	6	0	0	0	3	5	10	1	0	0
MRI head without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	1	1	0	7	9	1	0	0
MRI orbits without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	1	5	9	4	0	0
CTA head and neck with IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	5	5	1	2	3	3	9	1	0	0	0
MRA head and neck without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	5	5	0	2	3	3	10	1	0	0	0
MRI head without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	5	5	0	1	1	6	8	3	0	0	0
CT head with IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	4	4	0	2	3	8	5	1	0	0	0
MRA head and neck without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	4	4	0	5	2	9	3	0	0	0	0
Arteriography cervicocerebral	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	3	3	3	4	7	1	2	0	0	0	0
CT head without IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	3	3	2	3	7	5	1	1	0	0	0
CT orbits without and with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv		3	3	7	2	3	1	5	1	0	0	0
CT head without and with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	2	2	7	5	6	1	0	0	0	0	0
Radiography orbit	Usually not appropriate		⊗ <0.1 mSv	⊗ <0.03 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0

**Variant 4: Suspected optic neuritis. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI orbits without and with IV contrast	Usually appropriate		0 0 mSv	0 0 mSv [ped]	9	9	0	0	0	0	0	0	0	2	15
MRI head without and with IV contrast	Usually appropriate		0 0 mSv	0 0 mSv [ped]	8	8	0	0	0	0	1	0	3	5	8
MRI orbits without IV contrast	Usually appropriate		0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	1	3	4	6	3	0
MRI head without IV contrast	May be appropriate		0 0 mSv	0 0 mSv [ped]	6	6	1	0	0	0	4	4	6	2	0
CT orbits with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		3	3	6	2	2	3	2	2	0	0	0
CT head with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	2	6	3	2	3	1	2	0	0	0
CT head without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	7	3	3	2	1	1	0	0	0
CT orbits without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		2	2	7	2	3	3	1	1	0	0	0
CT orbits without IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		2	2	6	4	3	3	0	0	1	0	0
CTA head and neck with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	8	5	3	1	0	0	0	0	0
MRA head and neck without and with IV contrast	Usually not appropriate		0 0 mSv	0 0 mSv [ped]	2	2	8	5	3	1	0	0	0	0	0

MRA head and neck without IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	2	2	8	6	2	1	0	0	0	0	0
CT head without IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	2	2	6	5	3	4	1	0	0	0	0
Arteriography cervicocerebral	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	15	1	0	1	0	0	0	0	0
Radiography orbit	Usually not appropriate		⊗ <0.1 mSv	⊗ <0.03 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0

**Variant 5: Visual loss. Etiology identified on ophthalmologic examination or laboratory tests.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI orbits without IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	3	3	7	0	2	2	5	0	1	0	0
CT head without IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	2	2	8	2	2	2	2	0	0	1	0
CT orbits without IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv		2	2	8	1	3	2	2	0	0	1	0
MRI head without IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	2	2	7	2	0	3	3	1	1	0	0
MRI orbits without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	2	2	8	5	4	1	1	0	0	0	0
Arteriography cervicocerebral	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	13	2	1	1	0	0	0	0	0
CT head with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	1	1	9	2	2	2	1	0	1	0	0

CT head without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	9	3	3	0	1	1	0	0	0
CT orbits without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	9	2	1	1	3	1	0	0	0
CTA head and neck with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	9	5	2	0	0	0	1	0	0
MRA head and neck without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	9	5	2	0	0	0	1	0	0
MRA head and neck without IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	9	6	1	0	0	0	1	0	0
Radiography orbit	Usually not appropriate		☼ <0.1 mSv	☼ <0.03 mSv [ped]	1	1	16	0	0	1	0	0	0	0	0
CT orbits with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	11	3	4	1	0	0	0	0	0
MRI head without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	11	6	2	0	0	0	0	0	0

**Variant 6: Visual loss. Intraocular mass, optic nerve, or pre-chiasm symptoms. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI orbits without and with IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	1	0	1	17
CT orbits with IV contrast	Usually appropriate		☼☼☼ 1-10 mSv		7	7	0	0	0	0	2	4	5	5	3
MRI orbits without IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	7	7	0	0	1	0	0	4	12	2	0

CT orbits without IV contrast	May be appropriate		☼☼☼ 1-10 mSv		6	6	0	0	0	3	1	12	3	0	0
MRI head without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	1	0	0	2	2	12	1	0	1
MRI head without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	5	5	1	0	1	5	9	2	1	0	0
CT head with IV contrast	May be appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	5	5	0	1	1	3	11	1	0	0	0
CT head without IV contrast	May be appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	4	4	0	1	3	7	6	2	0	0	0
CTA head and neck with IV contrast	May be appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	4	4	1	0	4	5	7	1	1	0	0
MRA head and neck without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	4	4	1	1	5	6	1	4	1	0	0
MRA head and neck without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	4	4	1	3	2	9	3	1	0	0	0
Arteriography cervicocerebral	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	7	5	5	1	1	0	0	0	0
CT head without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	7	3	4	2	2	0	1	0	0
Radiography orbit	Usually not appropriate		☼ <0.1 mSv	☼ <0.03 mSv [ped]	1	1	18	1	0	0	0	0	0	0	0
CT orbits without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	9	3	5	0	0	0	0	0	0

**Variant 7: Nonischemic visual loss. Chiasm or post-chiasm symptoms. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without and with IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	1	4	14
MRI head without IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	7	7	0	0	0	0	1	4	10	4	0
CT head with IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	5	5	1	0	0	2	7	3	4	2	0
CT head without IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	5	5	1	0	0	5	4	3	5	1	0
CTA head and neck with IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	5	5	0	1	1	3	6	6	2	0	0
MRA head and neck without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	0	6	5	6	1	0	1
CT head without and with IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	5	5	1	0	2	3	11	0	0	0	0
CTV head with IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	4	4	0	2	3	5	3	6	0	0	0
MRV head without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	4	4	1	4	1	7	4	2	0	0	0
MRV head without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	4	4	0	3	3	3	8	0	0	0	0
MRA head and neck without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	4	4	0	3	2	5	7	0	0	0	0
CT orbits with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv		3	3	5	3	4	4	1	1	0	0	1
CT orbits without IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv		3	3	7	2	5	2	2	0	1	0	0

MRI orbits without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	3	3	4	2	10	0	1	0	0	0	0
MRI orbits without IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	3	3	5	1	10	1	0	0	0	0	0
Arteriography cervicocerebral	Usually not appropriate		⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	2	2	7	4	4	2	2	0	0	0	0
CT orbits without and with IV contrast	Usually not appropriate		⊗⊗⊗ 1-10 mSv		2	2	8	3	6	1	0	1	0	0	0
Radiography orbit	Usually not appropriate		⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	1	1	18	1	0	0	0	0	0	0	0

**Variant 8: Ophthalmoplegia or diplopia. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without and with IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	3	4	10
MRI orbits without and with IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	1	3	13
CT orbits with IV contrast	Usually appropriate		⊗⊗⊗ 1-10 mSv		7	7	0	0	0	0	2	3	4	3	5
MRI orbits without IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	7	7	0	0	0	1	1	6	7	2	0
MRI head without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	2	0	1	6	7	1	0
CT orbits without IV contrast	May be appropriate		⊗⊗⊗ 1-10 mSv		6	6	0	0	1	2	4	11	1	0	0

CTA head and neck with IV contrast	May be appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	6	6	0	0	1	1	4	13	0	0	0
MRA head and neck without and with IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	1	1	4	13	0	0	0
MRA head and neck without IV contrast	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	1	2	4	12	0	0	0
CT head with IV contrast	May be appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	5	5	0	0	1	4	12	2	0	0	0
CT head without IV contrast	May be appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	5	5	0	0	0	6	12	1	0	0	0
Arteriography cervicocerebral	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	3	1	5	4	3	1	0	0	0
CT head without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	7	2	7	2	1	0	0	0	0
Radiography orbit	Usually not appropriate		☼ <0.1 mSv	☼ <0.03 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0
CT orbits without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	9	3	4	1	0	0	0	0	0

## **Appendix Key**

A more complete discussion of the items presented below can be found by accessing the supporting documents at the designated hyperlinks.

**Appropriateness Category:** The panel's recommendation for a procedure based on the assessment of the risks and benefits of performing the procedure for the specified clinical scenario.

**SOE:** Strength of Evidence. The assessment of the amount and quality of evidence found in the peer reviewed medical literature for an appropriateness recommendation.

- **References:** The citation number and PMID for the reference(s) associated with the recommendation.
- **Study Quality:** The assessment of the quality of an individual reference based on the number of study quality elements described in the reference.

**RRL:** Relative Radiation Level. A population based assessment of the amount of radiation a typical patient may be exposed to during the specified procedure.

**Rating:** The final rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

**Median:** The median rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

**Final tabulations:** A histogram showing the number of panel members who rated the procedure as noted in the column heading (ie, 1, 2, 3, etc.).

Additional supporting documents about the AC methodology and processes can be found at [www.acr.org/ac](http://www.acr.org/ac).