Figure 17-2  Brain and orbital magnetic resonance (MR) images showing the anatomy of visual and orbital structures from the chiasm to the anterior orbit. (The left-globe abnormality is not pertinent to the figure’s objective.) A, T1-weighted axial image. B–D, T1-weighted coronal images. E, T2-weighted coronal image with fat saturation. F, T1-weighted coronal image. ACF = anterior cranial fossa; Ant segment = anterior segment; ICA = internal carotid artery; IO = inferior oblique muscle; IR = inferior rectus muscle; LR = lateral rectus muscle; Lev P = levator palpebrae superioris muscle; MCF = middle cranial fossa; MR = medial rectus muscle; Olf fossa = olfactory fossa; SO = superior oblique muscle; Sph sinus = sphenoid sinus; Sph wing = sphenoid wing; SR = superior rectus muscle; Temp lobe = temporal lobe; Vit = vitreous.
(Courtesy of M. Tariq Bhatti, MD.)
Table 17-3  Edema: DWI and ADC

<table>
<thead>
<tr>
<th>Type of Edema</th>
<th>DWI Signal</th>
<th>ADC Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cytotoxic</td>
<td>Bright (high or restricted diffusion)*</td>
<td>Dark (low)</td>
</tr>
<tr>
<td>Vasogenic</td>
<td>Dark (low)</td>
<td>Normal (sometimes bright)</td>
</tr>
</tbody>
</table>

ADC = apparent diffusion coefficient; DWI = diffusion-weighted imaging.  
*Bright signal on DWI represents restricted diffusion or decreased water movement.

Considerations when ordering an MRI:

- Metal in the body, including metallic intraocular or orbital foreign bodies
  - Screening radiography or CT may be helpful in detecting intraocular and orbital foreign bodies.
  - Consultation with a diagnostic radiologist is advised regarding the safety of some metals (e.g., MRI-compatible aneurysm clips).
  - Gold weight and titanium mesh orbital floor implants have shown no movement when placed in a magnetic field. Some clinicians prefer to wait for fibrosis to secure the implant before obtaining an MRI.
- Cardiac pacemaker or defibrillator
  - Consultation with a diagnostic radiologist regarding all implantable devices is advised.
- Allergy to gadolinium-based contrast media

Activities 17-1 and 17-2 demonstrate normal structures identified on axial and coronal orbital imaging, respectively, with CT and MRI.

ACTIVITY 17-1  Axial imaging of the normal orbit with computed tomography and magnetic resonance imaging.  
*Developed by Vikram S. Brar, MD. Figures reproduced with permission from Dutton JJ.  
Atlas of Clinical and Surgical Orbital Anatomy.  

ACTIVITY 17-2  Coronal imaging of the normal orbit with computed tomography and magnetic resonance imaging.  
*Developed by Vikram S. Brar, MD. Figures reproduced with permission from Dutton JJ.  
Atlas of Clinical and Surgical Orbital Anatomy.  
2nd ed. Elsevier/Saunders; 2011: Figs 11-7 to 11-12.

