ALLEGATO TECNICO
VALUTAZIONE IMMAGINI

SISTEMI A RISONANZA MAGNETICA (Lotti 1, 2, 3)

INDICAZIONI PER LA VALUTAZIONE DELLA QUALITA' DELLE IMMAGINI

QUALITÀ DELLE IMMAGINI (PUNTI MASSIMI 10)

Verrà valutata prendendo a riferimento:

a) **Le immagini acquisite tramite fantoccio, nei termini precisati nel presente Allegato Tecnico**
b) **Le immagini su paziente prodotte dalle ditte, nei termini precisati nel presente Allegato Tecnico**

a) Immagini acquisite tramite fantoccio

Le ditte dovranno fornire la documentazione tecnica di seguito dettagliata, aquisita ed elaborata secondo le modalità previste dal presente documento.

Al fine di consentire la comparazione dei sistemi RM presentati, tutte le immagini devono essere ottenute con un ACR Largephantom per il LOTTO RM 1,5 T e con un ACR SmallPhantom per il LOTTO RM ARTICOLARE e il APERTA A BASSO CAMPO. La ditta dovrà indicare la composizione del liquido utilizzato per le immagini.

Largephantom Guida e Istruzioni:

http://www.acr.org/~/media/ACR/Documents/Accreditation/MRI/LargePhantomGuidance.pdf

http://www.acr.org/~/media/ACR/Documents/Accreditation/MRI/LargePhantomInstructions.pdf

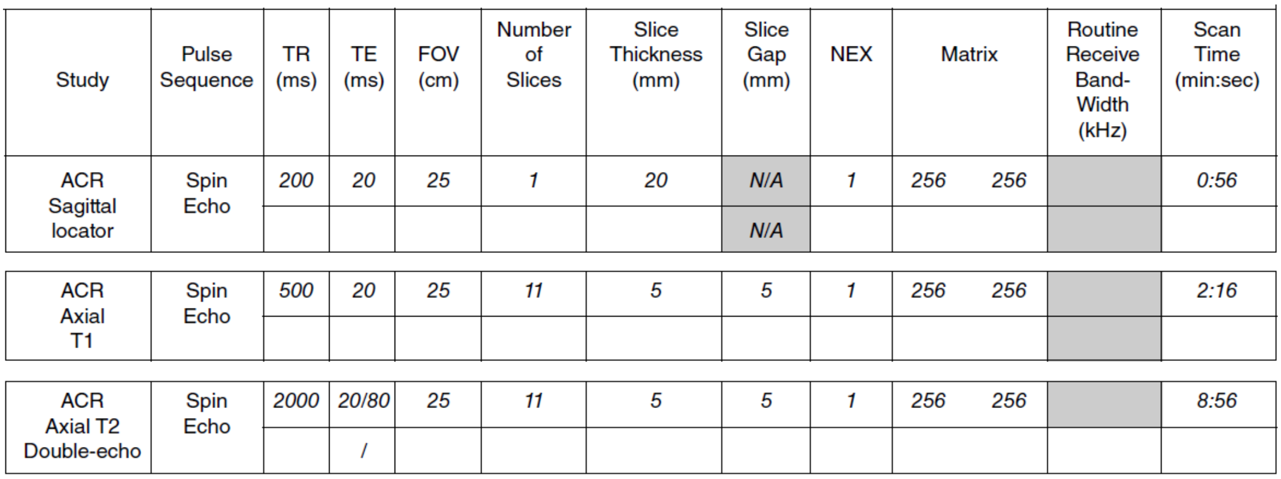
Smallphantom Guida e Istruzioni:

http://www.acr.org/~/media/ACR/Documents/Accreditation/MRI/SmallPhantomGuidance.pdf

http://www.acr.org/~/media/ACR/Documents/Accreditation/MRI/SmallPhantomInstructions.pdf

Le immagini richieste sono:

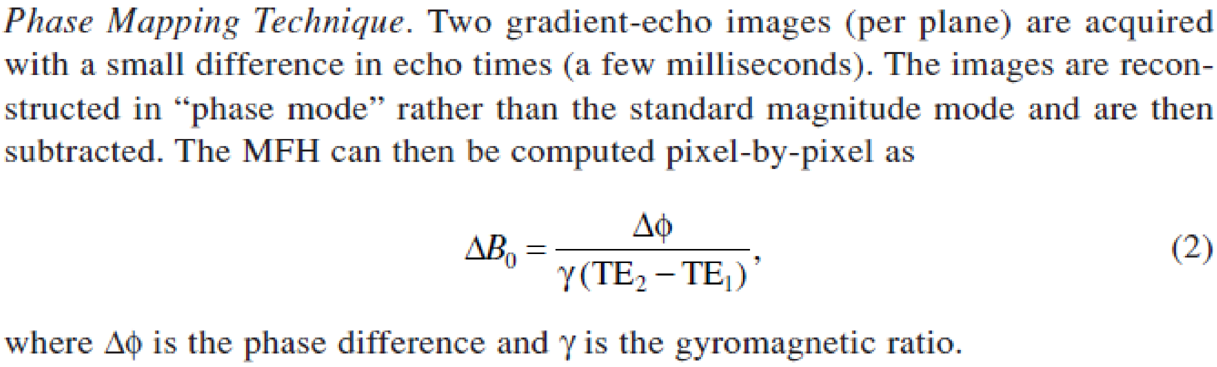
- Quelle riportate in tabella, rielaborate dal programma di accreditamento ACR :



Study	Pulse Sequence	TR (ms)	TE (ms)	FOV (cm)	Number of Slices	Slice Thickness (mm)	Slice Gap (mm)	NEX	Matrix	Routine Receive Band-Width (kHz)	Scan Time (min:sec)
ACR Sagittal locator	Spin Echo	200	20	25	1	20	N/A	1	256 256		0:56
							N/A				
ACR Axial T1	Spin Echo	500	20	25	11	5	5	1	256 256		2:16
ACR Axial T2 Double-echo	Spin Echo	2000	20/80	25	11	5	5	1	256 256		8:56
			/								

Serie 1: 1 ima (assoluta)
Serie 2: 11 ima (assolute)
Serie 3: 11+11 ima (assolute)
Bandwith indicativa: 100 kHz

- Quelle acquisite secondo il protocollo AAPM rpt 100 (a pagina 10 di https://aifmrm.files.wordpress.com/2013/02/rpt_100.pdf) secondo la procedura Phasemappingtechnique di seguito riportata e ricostruite in fase della zona uniforme del fantoccio.



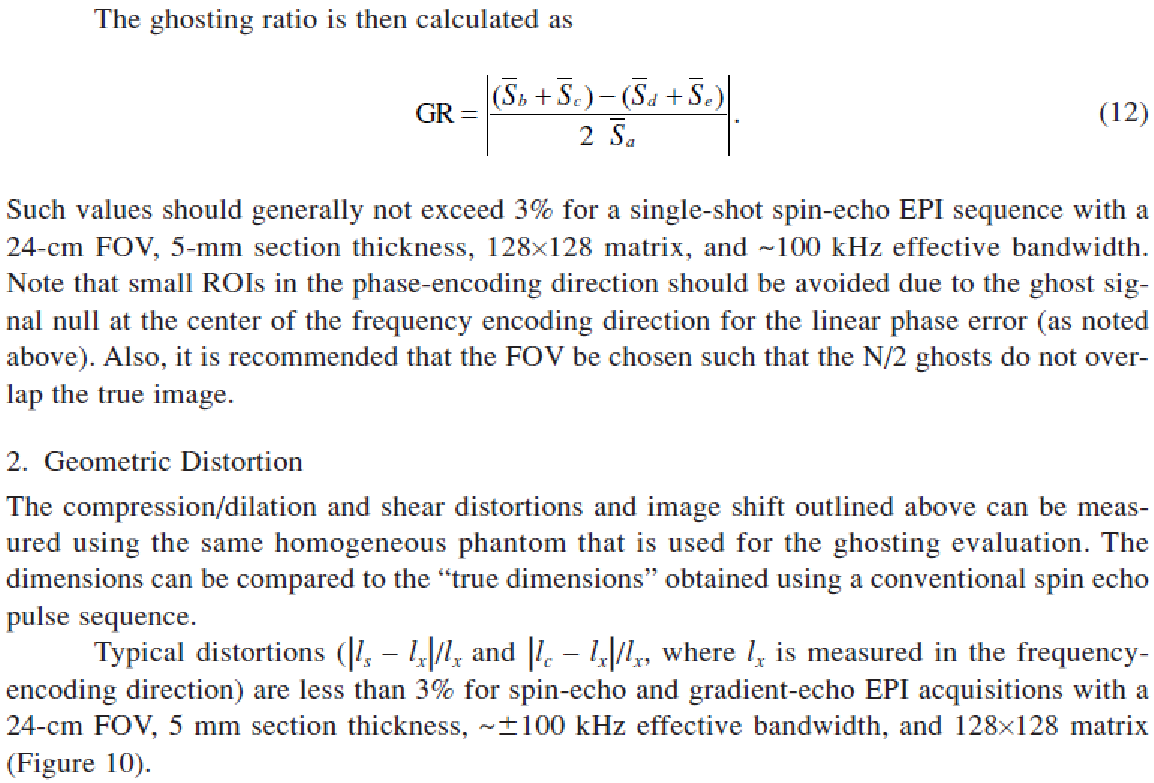
Phase Mapping Technique. Two gradient-echo images (per plane) are acquired with a small difference in echo times (a few milliseconds). The images are reconstructed in "phase mode" rather than the standard magnitude mode and are then subtracted. The MFH can then be computed pixel-by-pixel as

$$\Delta B_0 = \frac{\Delta\phi}{\gamma(\mathrm{TE}_2 - \mathrm{TE}_1)}, \qquad (2)$$

where $\Delta\phi$ is the phase difference and γ is the gyromagnetic ratio.

Parametri di acquisizione Serie 4: 1 ima (fase)= FastGradientEcho, TR 400, TE 20 FOV 25 flip30°
Parametro valutato: omogeneità di B0

- Quelle acquisite secondo protocollo aapm (a pagina 26 di https://aifmrm.files.wordpress.com/2013/02/rpt_100.pdf)



The ghosting ratio is then calculated as

$$\mathrm{GR} = \left| \frac{(\bar{S}_b + \bar{S}_c) - (\bar{S}_d + \bar{S}_e)}{2\ \bar{S}_a} \right|. \tag{12}$$

Such values should generally not exceed 3% for a single-shot spin-echo EPI sequence with a 24-cm FOV, 5-mm section thickness, 128×128 matrix, and ~100 kHz effective bandwidth. Note that small ROIs in the phase-encoding direction should be avoided due to the ghost signal null at the center of the frequency encoding direction for the linear phase error (as noted above). Also, it is recommended that the FOV be chosen such that the N/2 ghosts do not overlap the true image.

2. Geometric Distortion

The compression/dilation and shear distortions and image shift outlined above can be measured using the same homogeneous phantom that is used for the ghosting evaluation. The dimensions can be compared to the "true dimensions" obtained using a conventional spin echo pulse sequence.

Typical distortions ($|l_s - l_x|/l_x$ and $|l_c - l_x|/l_x$, where l_x is measured in the frequency-encoding direction) are less than 3% for spin-echo and gradient-echo EPI acquisitions with a 24-cm FOV, 5 mm section thickness, ~±100 kHz effective bandwidth, and 128×128 matrix (Figure 10).

Parametri di acquisizione : Serie 5: 2+2 ima (assolute)= EPI, TR= 3000, TE = 50-55, Fov<25 cm, Th/Gap 5 mm 128x128. 100 kHz, 10 minuti; zona uniforme + zona inserto linearità

Parametri valutati: ghost, accuratezza geometrica e distorsione

- Quelle acquisite con

Parametri di acquisizione: serie 6-8, 2 immagini utili (corrispondenti alle slice 1 e 11 della serie 2) per tutte: SE, TR= 1000 TE = 20, FOV=25, 256x256 varia Th = gap= minimo, 3mm ,10 mm

Parametri valutati: caratteristiche di strato al variare delle impostazioni Th/Gap

b) Immagini su paziente

La ditta dovrà fornire le immagini degli esami elencati , acquisite nei tempi massimi definiti e secondo i parametri indicati, come riportato nelle tabelle che seguono, rielaborati dalla Clinical Guide della ACR relativamente al programma di accreditamento MRI (http://www.acr.org/~/media/ACR/Documents/Accreditation/MRI/ClinicalGuide.pdf).

Per ogni distretto anatomico e sequenza richiesta saranno valutati complessivamente

1) Contrasto dell'immagine (categoria A della sopracitata Clinical Guide della ACR)
2) Copertura anatomica (scelta del FOV) e piani di immagine scelti (categoria C della sopracitata Clinical Guide della ACR)
3) Assenza di artefatti (categoria E della sopracitata Clinical Guide della ACR)

4) Completezza delle Info presenti sull'immagine (presenza di tutti i dati che identificano il paziente, il tipo di sequenza, etc) (categoria F della sopracitata Clinical Guide della ACR)

Gli esami per il LOTTO 1 RM 1,5 T sono:

- studio del condotti uditivi interni (per perdita dell'udito)
- studio dell'encefalo per TIA
- studio delle orbite
- Studio della Colonna cervicale per lesioni intramidollari (es. patologia demielinizzante)
- studio del fegato e delle vie biliari (incluse sequenze CPRM)
- studio del rene
- MRA vasi del collo
- studio del cuore (sequenze di base)

Gli esami per il LOTTO 2 RM APERTA A BASSO CAMPO sono:

- Gomito
- Spalla
- Polso
- Ginocchio
- Colonna cervicale
- Colonna dorsale
- Colonna lombare

Gli esami per il LOTTO 3 RM ARTICOLARE A BASSO CAMPO sono:

- Gomito
- Spalla
- Polso
- Ginocchio

E se l'apparecchiatura offerta prevede la possibilità di studio

- Colonna cervicale
- Colonna dorsale
- Colonna lombare

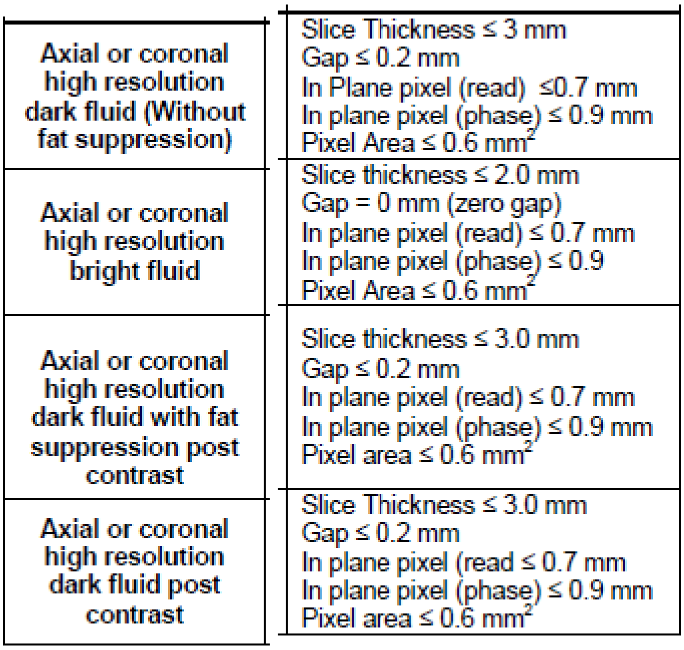
I tempi massimi e i parametri di ogni singolo esame vengono di seguito riportati.

ESAMI LOTTO RM 1,5 T

STUDIO DEL CONDOTTI UDITIVI INTERNI (PER PERDITA DELL'UDITO)

TEMPO MASSIMO PE RESEGUIRE L'ESAME MINORE O UGUALE A 30 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



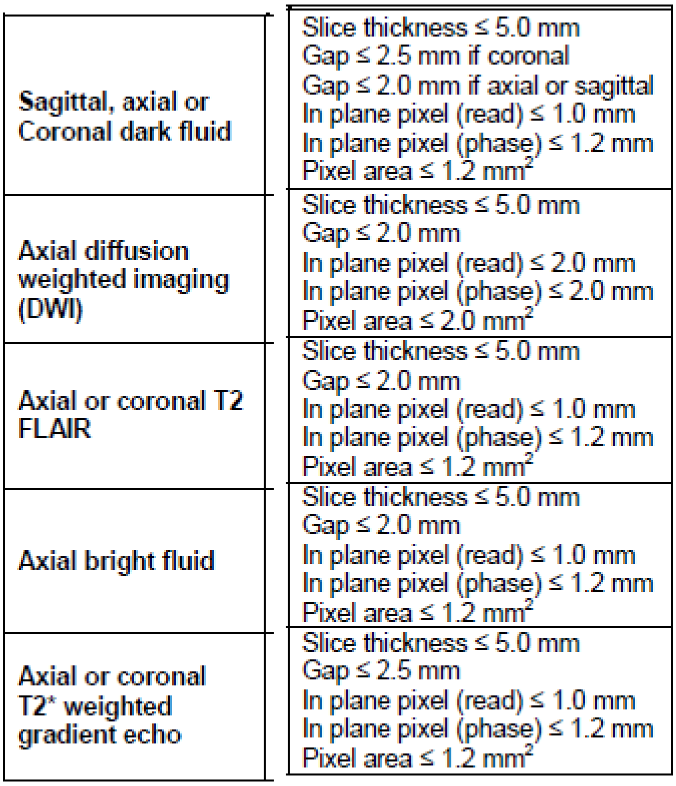
Axial or coronal high resolution dark fluid (Without fat suppression)	Slice Thickness ≤ 3 mm Gap ≤ 0.2 mm In Plane pixel (read) ≤0.7 mm In plane pixel (phase) ≤ 0.9 mm Pixel Area ≤ 0.6 mm^2
Axial or coronal high resolution bright fluid	Slice thickness ≤ 2.0 mm Gap = 0 mm (zero gap) In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 0.9 Pixel Area ≤ 0.6 mm^2
Axial or coronal high resolution dark fluid with fat suppression post contrast	Slice thickness ≤ 3.0 mm Gap ≤ 0.2 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 0.9 mm Pixel area ≤ 0.6 mm^2
Axial or coronal high resolution dark fluid post contrast	Slice Thickness ≤ 3.0 mm Gap ≤ 0.2 mm In plane pixel (read ≤ 0.7 mm In plane pixel (phase) ≤ 0.9 mm Pixel area ≤ 0.6 mm^2

I dati sopra riportati devono essere intesi come indicativi

STUDIO DELL’ENCEFALO PER TIA

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 35 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



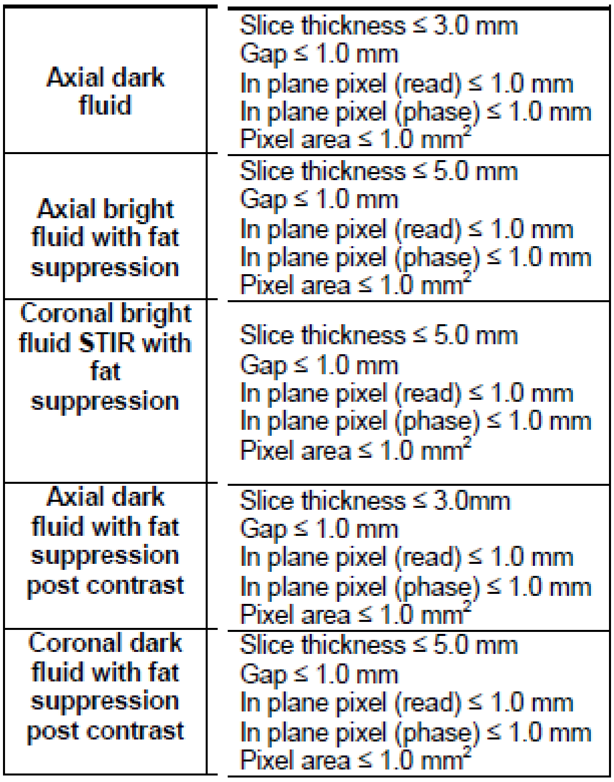
Sagittal, axial or Coronal dark fluid	Slice thickness ≤ 5.0 mm Gap ≤ 2.5 mm if coronal Gap ≤ 2.0 mm if axial or sagittal In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.2 mm Pixel area ≤ 1.2 mm^2
Axial diffusion weighted imaging (DWI)	Slice thickness ≤ 5.0 mm Gap ≤ 2.0 mm In plane pixel (read) ≤ 2.0 mm In plane pixel (phase) ≤ 2.0 mm Pixel area ≤ 2.0 mm^2
Axial or coronal T2 FLAIR	Slice thickness ≤ 5.0 mm Gap ≤ 2.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.2 mm Pixel area ≤ 1.2 mm^2
Axial bright fluid	Slice thickness ≤ 5.0 mm Gap ≤ 2.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.2 mm Pixel area ≤ 1.2 mm^2
Axial or coronal T2* weighted gradient echo	Slice thickness ≤ 5.0 mm Gap ≤ 2.5 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.2 mm Pixel area ≤ 1.2 mm^2

I dati sopra riportati devono essere intesi come indicativi

STUDIO DELLE ORBITE

TEMPO MASSIMO PER ESEGUIRE L'ESAME MINORE O UGUALE A 30 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



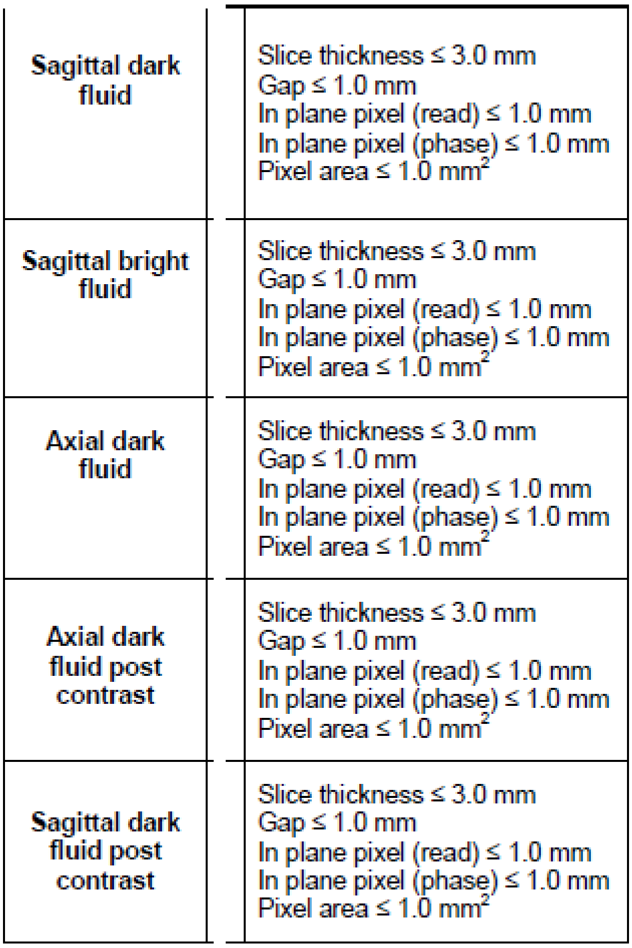
Axial dark fluid	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Axial bright fluid with fat suppression	Slice thickness ≤ 5.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Coronal bright **fluid STIR with fat suppression**	Slice thickness ≤ 5.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Axial dark fluid with fat suppression post contrast	Slice thickness ≤ 3.0mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Coronal dark **fluid with fat suppression** post contrast	Slice thickness ≤ 5.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2

I dati sopra riportati devono essere intesi come indicativi

COLONNA CERVICALE PER LESIONI INTRAMIDOLLARI

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 40 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



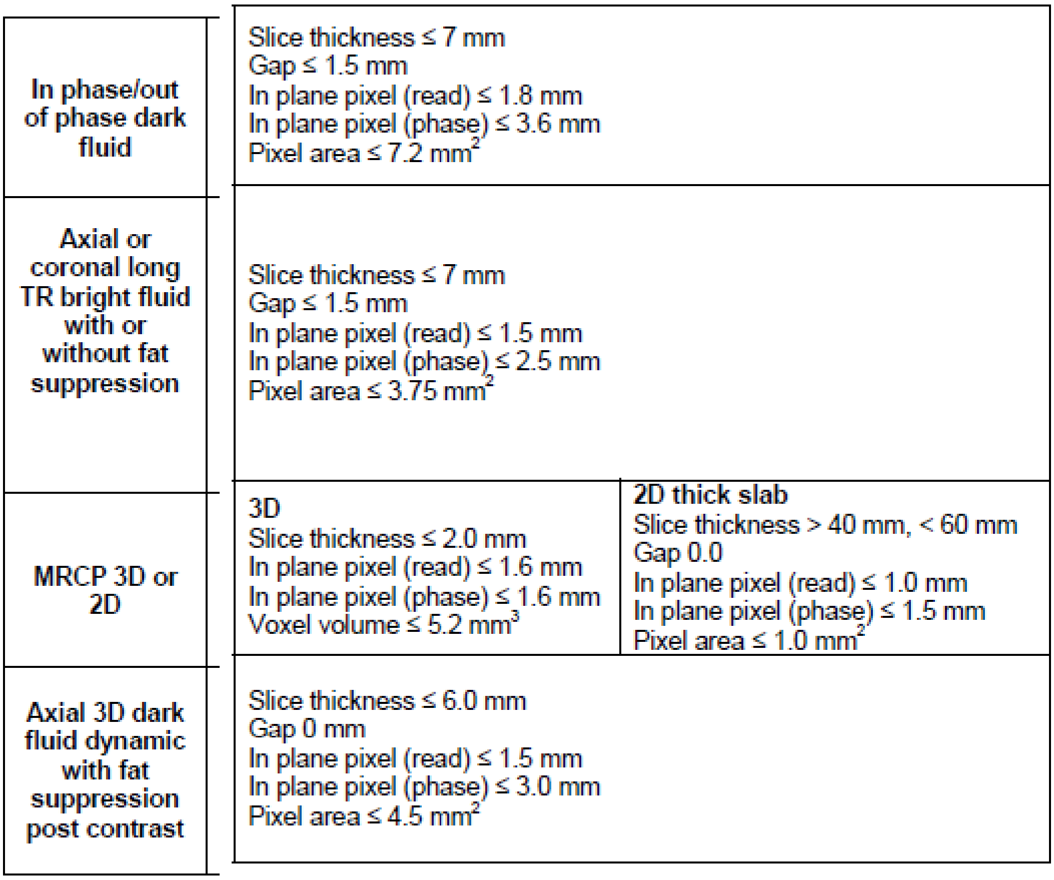
Sagittal dark fluid	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Sagittal bright fluid	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Axial dark fluid	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Axial dark fluid post contrast	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Sagittal dark fluid post contrast	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2

I dati sopra riportati devono essere intesi come indicativi

STUDIO DEL FEGATO E DELLE VIE BILIARI (INCLUSE SEQUENZE CPRM)

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 35 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



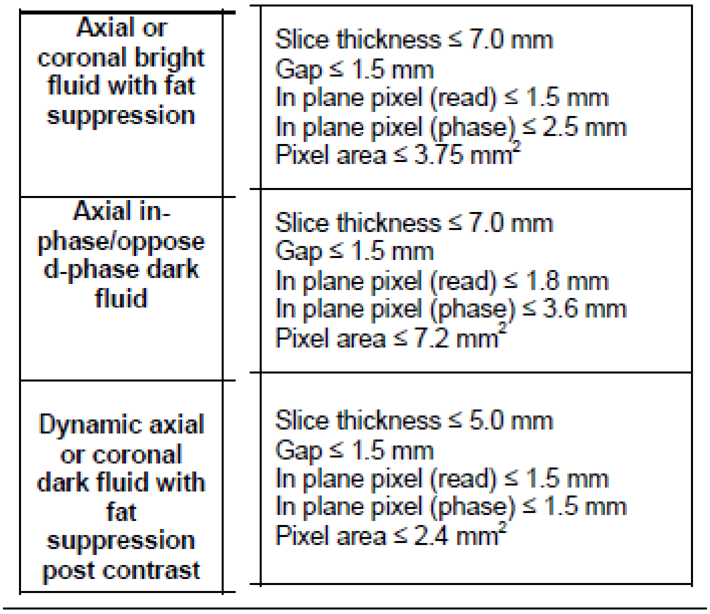
In phase/out of phase dark fluid	Slice thickness ≤ 7 mm Gap ≤ 1.5 mm In plane pixel (read) ≤ 1.8 mm In plane pixel (phase) ≤ 3.6 mm Pixel area ≤ 7.2 mm^2	
Axial or coronal long TR bright fluid with or without fat suppression	Slice thickness ≤ 7 mm Gap ≤ 1.5 mm In plane pixel (read) ≤ 1.5 mm In plane pixel (phase) ≤ 2.5 mm Pixel area ≤ 3.75 mm^2	
MRCP 3D or 2D	3D Slice thickness ≤ 2.0 mm In plane pixel (read) ≤ 1.6 mm In plane pixel (phase) ≤ 1.6 mm Voxel volume ≤ 5.2 mm^3	**2D thick slab** Slice thickness > 40 mm, < 60 mm Gap 0.0 In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.5 mm Pixel area ≤ 1.0 mm^2
Axial 3D dark fluid dynamic with fat suppression post contrast	Slice thickness ≤ 6.0 mm Gap 0 mm In plane pixel (read) ≤ 1.5 mm In plane pixel (phase) ≤ 3.0 mm Pixel area ≤ 4.5 mm^2	

I dati sopra riportati devono essere intesi come indicativi

STUDIO DEL RENE

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 35 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



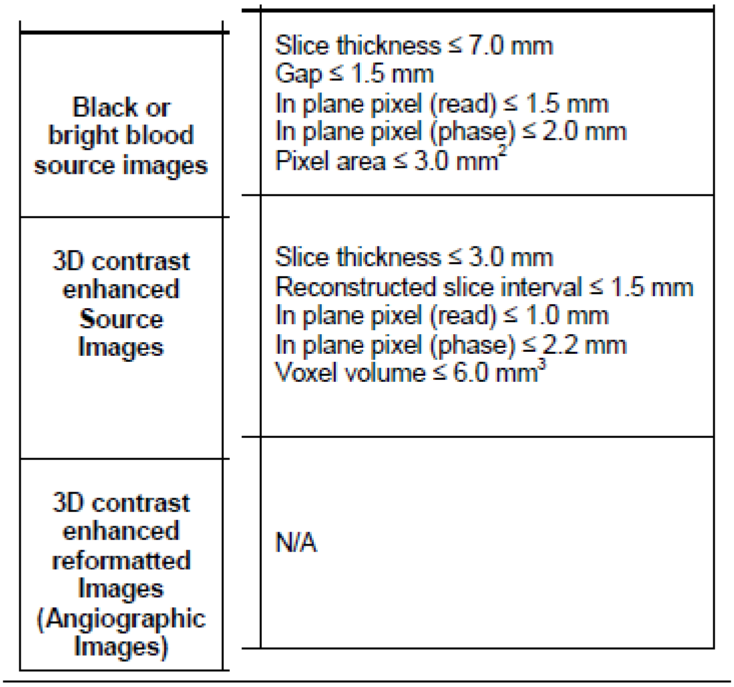
Axial or coronal bright fluid with fat suppression	Slice thickness ≤ 7.0 mm Gap ≤ 1.5 mm In plane pixel (read) ≤ 1.5 mm In plane pixel (phase) ≤ 2.5 mm Pixel area ≤ 3.75 mm^2
Axial in-phase/opposed-phase dark fluid	Slice thickness ≤ 7.0 mm Gap ≤ 1.5 mm In plane pixel (read) ≤ 1.8 mm In plane pixel (phase) ≤ 3.6 mm Pixel area ≤ 7.2 mm^2
Dynamic axial or coronal dark fluid with fat suppression post contrast	Slice thickness ≤ 5.0 mm Gap ≤ 1.5 mm In plane pixel (read) ≤ 1.5 mm In plane pixel (phase) ≤ 1.5 mm Pixel area ≤ 2.4 mm^2

I dati sopra riportati devono essere intesi come indicativi

MRA VASI DEL COLLO

TEMPO MASSIMO PER ESEGUIRE L'ESAME MINORE O UGUALE A 20 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



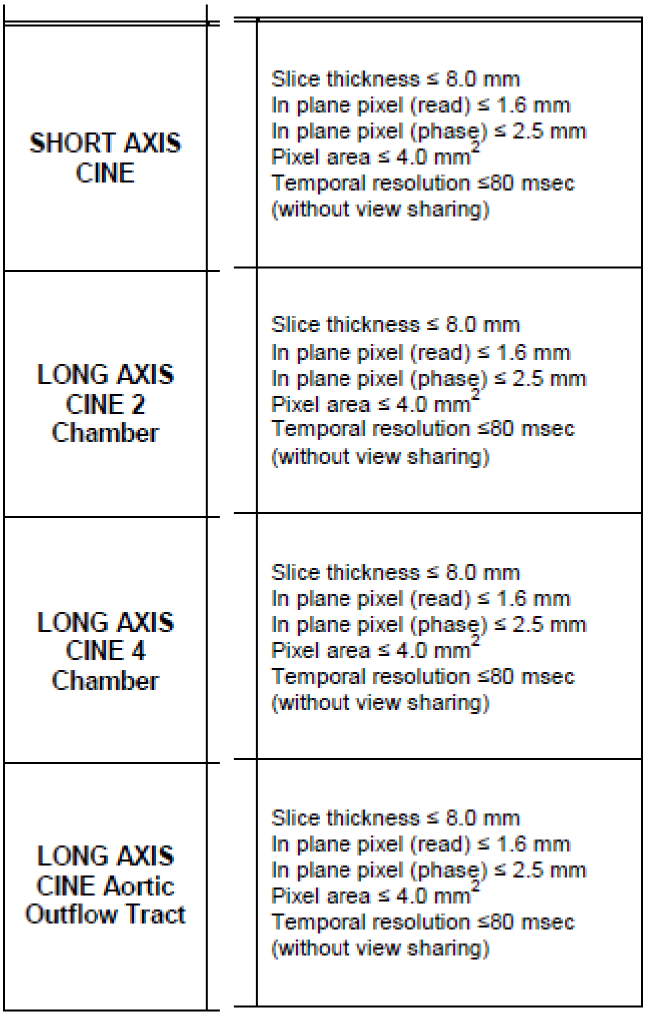
Black or bright blood source images	Slice thickness ≤ 7.0 mm Gap ≤ 1.5 mm In plane pixel (read) ≤ 1.5 mm In plane pixel (phase) ≤ 2.0 mm Pixel area ≤ 3.0 mm^2
3D contrast enhanced Source Images	Slice thickness ≤ 3.0 mm Reconstructed slice interval ≤ 1.5 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 2.2 mm Voxel volume ≤ 6.0 mm^3
3D contrast enhanced reformatted Images (Angiographic Images)	N/A

I dati sopra riportati devono essere intesi come indicativi

STUDIO DEL CUORE

TEMPO MASSIMO PER ESEGUIRE L'ESAME NON DEFINITO

SEQUENZE RICHIESTE E PARAMETRI



SHORT AXIS CINE	Slice thickness ≤ 8.0 mm In plane pixel (read) ≤ 1.6 mm In plane pixel (phase) ≤ 2.5 mm Pixel area ≤ 4.0 mm^2 Temporal resolution ≤80 msec (without view sharing)
LONG AXIS CINE 2 Chamber	Slice thickness ≤ 8.0 mm In plane pixel (read) ≤ 1.6 mm In plane pixel (phase) ≤ 2.5 mm Pixel area ≤ 4.0 mm^2 Temporal resolution ≤80 msec (without view sharing)
LONG AXIS CINE 4 Chamber	Slice thickness ≤ 8.0 mm In plane pixel (read) ≤ 1.6 mm In plane pixel (phase) ≤ 2.5 mm Pixel area ≤ 4.0 mm^2 Temporal resolution ≤80 msec (without view sharing)
LONG AXIS CINE Aortic Outflow Tract	Slice thickness ≤ 8.0 mm In plane pixel (read) ≤ 1.6 mm In plane pixel (phase) ≤ 2.5 mm Pixel area ≤ 4.0 mm^2 Temporal resolution ≤80 msec (without view sharing)

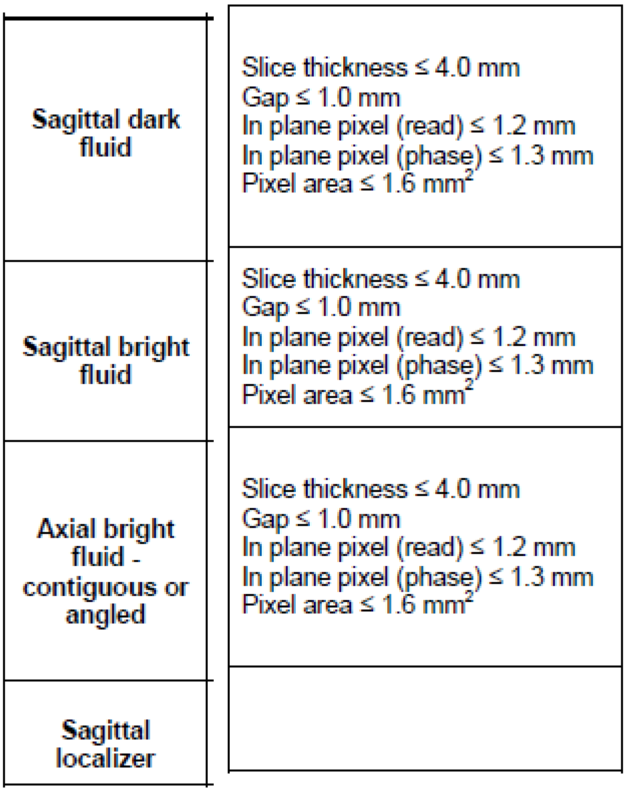
I dati sopra riportati devono essere intesi come indicativi

ESAMI LOTTO 2 RM APERTA A BASSO CAMPO
E LOTTO 3 RM ARTICOLARE

COLONNA DORSALE (per RM articolare solo se possibile)

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 35 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



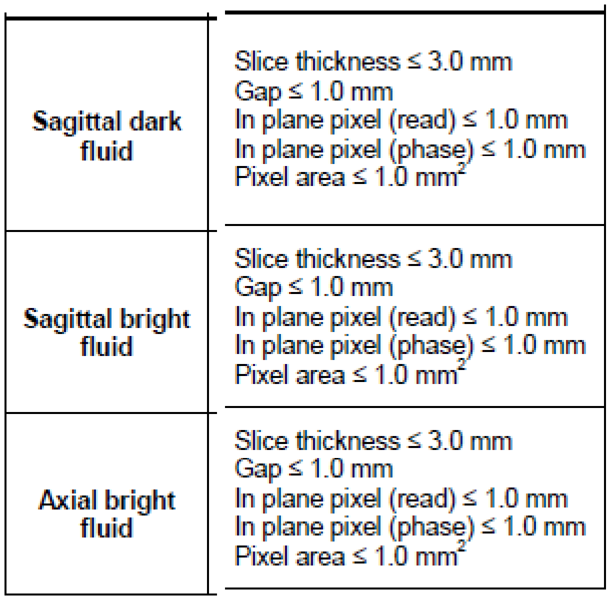
Sagittal dark fluid	Slice thickness ≤ 4.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.2 mm In plane pixel (phase) ≤ 1.3 mm Pixel area ≤ 1.6 mm^2
Sagittal bright fluid	Slice thickness ≤ 4.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.2 mm In plane pixel (phase) ≤ 1.3 mm Pixel area ≤ 1.6 mm^2
Axial bright fluid - contiguous or angled	Slice thickness ≤ 4.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.2 mm In plane pixel (phase) ≤ 1.3 mm Pixel area ≤ 1.6 mm^2
Sagittal localizer	

I dati sopra riportati devono essere intesi come indicativi

COLONNA CERVICALE (per RM articolare solo se possibile)

TEMPO MASSIMO PER ESEGUIRE L'ESAME MINORE O UGUALE A 35 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



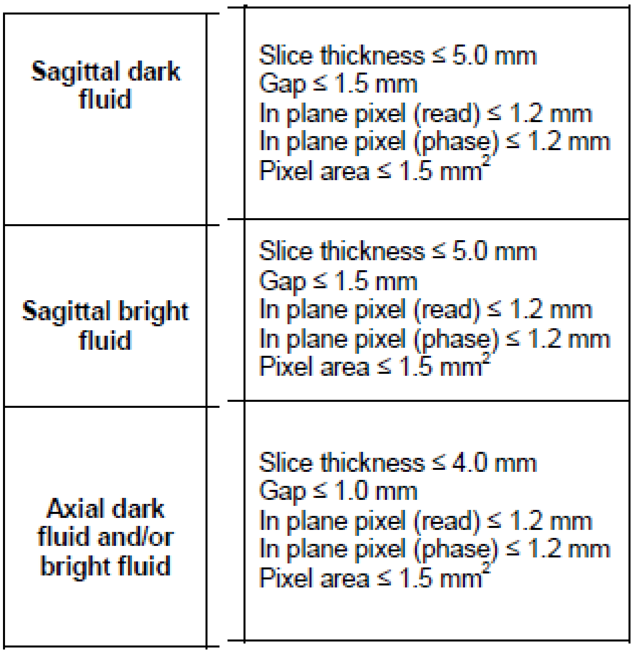
Sagittal dark fluid	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Sagittal bright fluid	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2
Axial bright fluid	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.0 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 1.0 mm^2

I dati sopra riportati devono essere intesi come indicativi

COLONNA LOMBARE (per RM articolare solo se possibile)

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 35 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



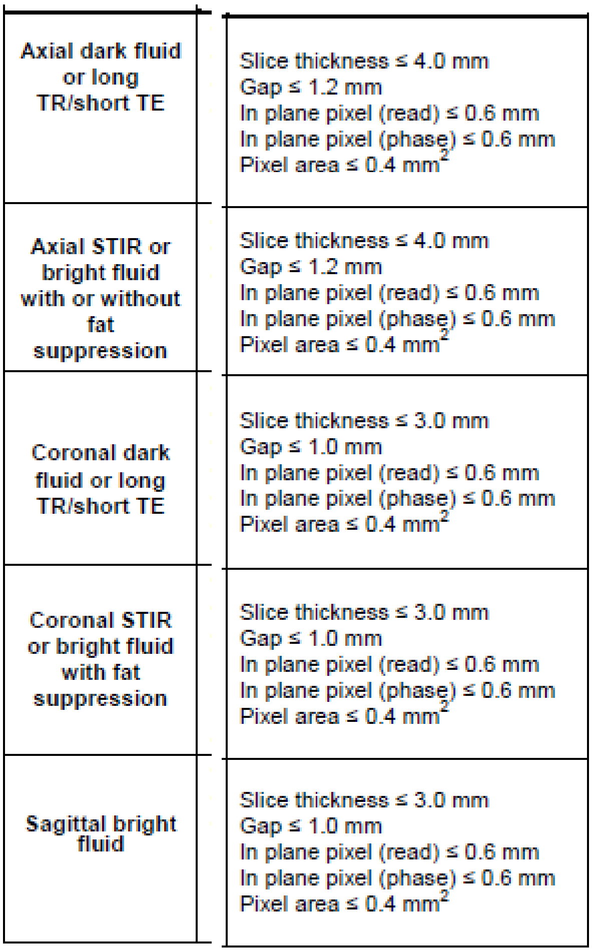
Sagittal dark fluid	Slice thickness ≤ 5.0 mm Gap ≤ 1.5 mm In plane pixel (read) ≤ 1.2 mm In plane pixel (phase) ≤ 1.2 mm Pixel area ≤ 1.5 mm^2
Sagittal bright fluid	Slice thickness ≤ 5.0 mm Gap ≤ 1.5 mm In plane pixel (read) ≤ 1.2 mm In plane pixel (phase) ≤ 1.2 mm Pixel area ≤ 1.5 mm^2
Axial dark fluid and/or bright fluid	Slice thickness ≤ 4.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 1.2 mm In plane pixel (phase) ≤ 1.2 mm Pixel area ≤ 1.5 mm^2

I dati sopra riportati devono essere intesi come indicativi

GOMITO

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 45 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



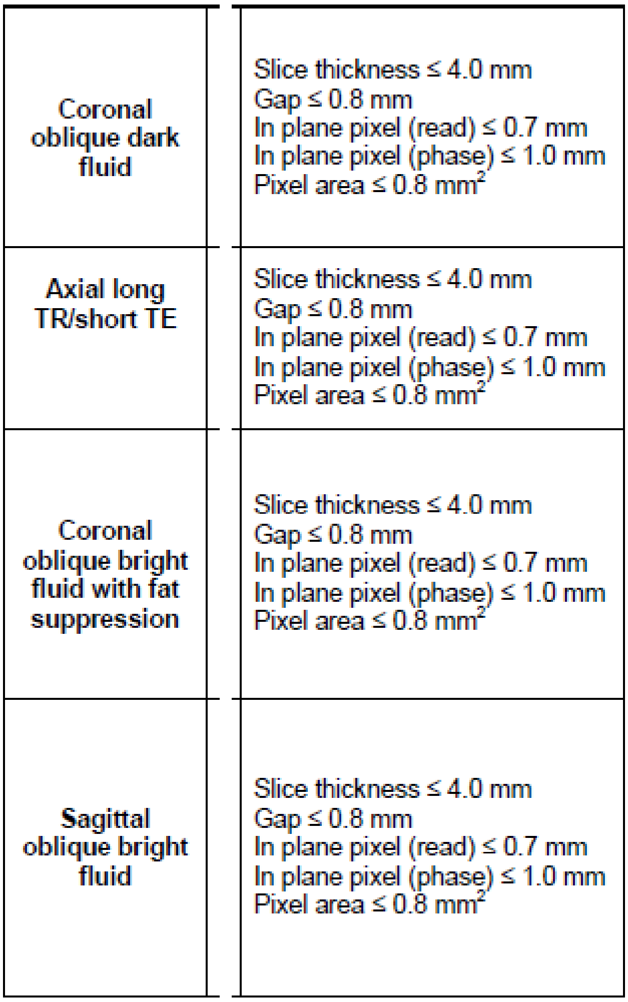
Axial dark fluid or long TR/short TE	Slice thickness ≤ 4.0 mm Gap ≤ 1.2 mm In plane pixel (read) ≤ 0.6 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.4 mm^2
Axial STIR or bright fluid with or without fat suppression	Slice thickness ≤ 4.0 mm Gap ≤ 1.2 mm In plane pixel (read) ≤ 0.6 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.4 mm^2
Coronal dark fluid or long TR/short TE	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 0.6 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.4 mm^2
Coronal STIR or bright fluid with fat suppression	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 0.6 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.4 mm^2
Sagittal bright fluid	Slice thickness ≤ 3.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 0.6 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.4 mm^2

I dati sopra riportati devono essere intesi come indicativi

SPALLA

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 35 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



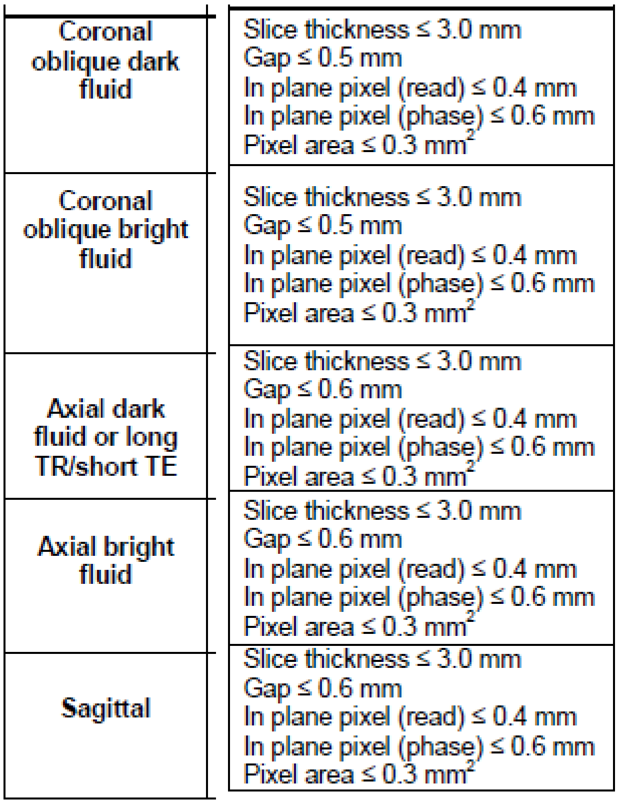
Coronal oblique dark fluid	Slice thickness ≤ 4.0 mm Gap ≤ 0.8 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 0.8 mm^2
Axial long TR/short TE	Slice thickness ≤ 4.0 mm Gap ≤ 0.8 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 0.8 mm^2
Coronal oblique bright fluid with fat suppression	Slice thickness ≤ 4.0 mm Gap ≤ 0.8 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 0.8 mm^2
Sagittal oblique bright fluid	Slice thickness ≤ 4.0 mm Gap ≤ 0.8 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 1.0 mm Pixel area ≤ 0.8 mm^2

I dati sopra riportati devono essere intesi come indicativi

POLSO

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 35 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



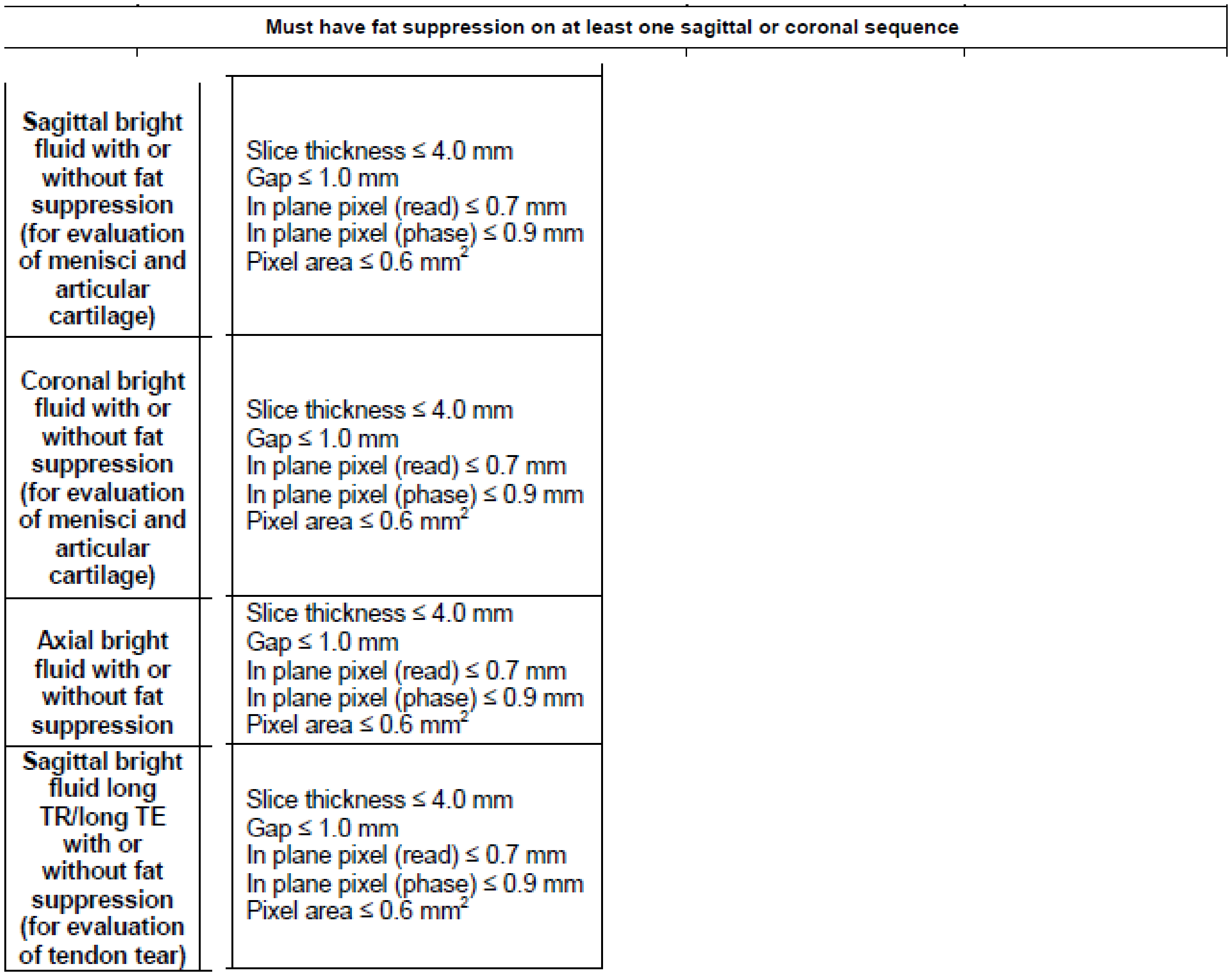
Coronal oblique dark fluid	Slice thickness ≤ 3.0 mm Gap ≤ 0.5 mm In plane pixel (read) ≤ 0.4 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.3 mm^2
Coronal oblique bright fluid	Slice thickness ≤ 3.0 mm Gap ≤ 0.5 mm In plane pixel (read) ≤ 0.4 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.3 mm^2
Axial dark fluid or long TR/short TE	Slice thickness ≤ 3.0 mm Gap ≤ 0.6 mm In plane pixel (read) ≤ 0.4 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.3 mm^2
Axial bright fluid	Slice thickness ≤ 3.0 mm Gap ≤ 0.6 mm In plane pixel (read) ≤ 0.4 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.3 mm^2
Sagittal	Slice thickness ≤ 3.0 mm Gap ≤ 0.6 mm In plane pixel (read) ≤ 0.4 mm In plane pixel (phase) ≤ 0.6 mm Pixel area ≤ 0.3 mm^2

I dati sopra riportati devono essere intesi come indicativi

GINOCCHIO

TEMPO MASSIMO PER ESEGUIRE L’ESAME MINORE O UGUALE A 30 MINUTI

SEQUENZE RICHIESTE E PARAMETRI



Must have fat suppression on at least one sagittal or coronal sequence

Sagittal bright fluid with or without fat suppression (for evaluation of menisci and articular cartilage)	Slice thickness ≤ 4.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 0.9 mm Pixel area ≤ 0.6 mm^2
Coronal bright fluid with or without fat suppression (for evaluation of menisci and articular cartilage)	Slice thickness ≤ 4.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 0.9 mm Pixel area ≤ 0.6 mm^2
Axial bright fluid with or without fat suppression	Slice thickness ≤ 4.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 0.9 mm Pixel area ≤ 0.6 mm^2
Sagittal bright fluid long TR/long TE with or without fat suppression (for evaluation of tendon tear)	Slice thickness ≤ 4.0 mm Gap ≤ 1.0 mm In plane pixel (read) ≤ 0.7 mm In plane pixel (phase) ≤ 0.9 mm Pixel area ≤ 0.6 mm^2

I dati sopra riportati devono essere intesi come indicativi