

Typical signal patterns of hepatic mass lesions in Primovist®-enhanced MR imaging procedures

Benign/malignant	Mass like lesion	T2-weighted image	T1-weighted image				
			Pre-contrast	Dynamic image			Hepatocyte phase (approx. 20 minutes after injection)
				Arterial phase	Portal-venous phase (approx. 1 minute after injection)	Late phase (approx. 2–3 minutes after injection)	
Malignant	Moderately–poorly differentiated hepatocellular carcinoma						
	Liver metastases (in cases of hypovascular primary tumour)						
Benign	Haemangioma						
	Focal nodular hyperplasia						
	Cyst						

Differential diagnosis of hepatocyte-derived nodules by typical signal patterns of Primovist®-enhanced MR imaging procedures

Benign/malignant	Mass-like lesion	T2-weighted image	T1-weighted image				
			Pre-contrast	Dynamic image			Hepatocyte phase (approx. 20 minutes after injection)
				Arterial phase	Portal-venous phase (approx. 1 minute after injection)	Late phase (approx. 2–3 minutes after injection)	
Malignant	Moderately–poorly differentiated hepatocellular carcinoma with marked bile production						
	Well differentiated hepatocellular carcinoma	 or or 	 or or 	 or or 	 or or 	 or or 	 or or
	Hepatocellular carcinoma (nodule-in-nodule type)						
Benign	Dysplastic nodule						

The above reference tables have been produced under the supervision of Dr Akihiro Tanimoto, Department of Diagnostic Radiology, Keio University School of Medicine, Japan, and was sponsored by Bayer.

Signal patterns of actual lesions do not always show the same results as indicated in this material.

Primovist should be used only when diagnostic information is essential and not available with unenhanced magnetic resonance imaging (MRI) and when delayed phase imaging is required.

PRESCRIBING INFORMATION
Primovist® (gadoxetate disodium) 0.25 mmol/ml, solution for injection, prefilled syringe
Prescribing Information (Refer to full Summary of Product Characteristics (SmPC) before prescribing)

Presentation: Each ml solution for injection contains 181.43mg/ml gadoxetate disodium. **Indication(s):** Detection of focal liver lesions and providing information on the character of lesions in T1-weighted magnetic resonance imaging (MRI). Use only when diagnostic information is essential and not available with unenhanced MRI and when delayed phase imaging is required. For diagnostic use by intravenous administration only. **Posology & method of administration:** Observe usual safety precautions for MRI (e.g. exclude cardiac pacemakers and ferromagnetic implants). Administer dose undiluted as an intravenous bolus injection at a flow rate of about 2ml/sec. After injection, flush cannula/line with 0.9% saline. Observe patients for at least 30 minutes after the injection. Use the lowest dose that provides sufficient enhancement for diagnostic purposes. The dose should be calculated based on the patient's body weight and should not exceed the recommended dose per kg of body weight detailed below. Recommended doses are: **Adults:** 0.1ml/kg body weight. **Impaired renal function:** Use of Primovist should be avoided in patients with severe renal impairment (GFR <30ml/min/1.73m²) and in patients in the perioperative liver transplantation period unless the diagnostic information is essential and not available with non-contrast enhanced MRI. If use cannot be avoided, dose should not exceed 0.025mmol/kg body weight. Do not use more than one dose per scan. Do not repeat the dose for at least 7 days. **Paediatric population:** The safety and efficacy of Primovist have not been established in patients under 18 years old. **Patients with hepatic impairment:** No dose adjustment necessary. **Elderly population** (≥65yrs):

No dose adjustment necessary. Exercise caution. **Contra-indications:** Hypersensitivity to active substance or to any excipients. **Warnings & precautions:** It is recommended to screen all patients for renal dysfunction by obtaining laboratory tests, particularly patients over 65 yrs. Nephrogenic systemic fibrosis (NSF) has been reported with some gadolinium-containing contrast agents in patients with acute or chronic severe renal impairment (GFR<30ml/min/1.73m²). Patients undergoing liver transplantation are at particular risk since incidence of acute renal failure is high in this group. Use should be avoided in patients with severe renal impairment and in patients in perioperative liver transplantation period unless diagnostic information is essential and not available with non-contrast enhanced MRI. Haemodialysis shortly after Primovist administration may be useful at removing Primovist from the body. There is no evidence to support initiation of haemodialysis for prevention or treatment of NSF in patients not already undergoing haemodialysis. Use with caution in patients: with severe cardiovascular problems; with, or with a family history of, congenital long QT syndrome; with drugs known to prolong cardiac repolarisation, particularly in patients with previous arrhythmias. Should not be used in patients with uncorrected hypokalaemia. Primovist may cause transient QT prolongation. Allergy-like reactions, including shock, reported rarely. Patients with a history of allergic disorders or bronchial asthma or who have previously reacted to contrast media are at higher risk of hypersensitivity reactions. Most reactions occur within 30 minutes of administration but rarely delayed reactions may occur after hours to days. Appropriate drugs and instruments for treatment of hypersensitivity must be readily available. Hypersensitivity reactions can be more intense in patients on beta-blockers, particularly in patients with asthma. Patients taking beta-blockers who experience hypersensitivity may be resistant to treatment effects of beta-agonists. If hypersensitivity reactions

occur, stop injection immediately. Do not administer intramuscularly due to risk of local intolerance reactions including focal necrosis. After administration of gadoxetate disodium, gadolinium can be retained in the brain and in other body tissues (bones, liver, kidneys, skin) and can cause dose-dependent increases in T1-weighted signal intensity in the brain, particularly in the dentate nucleus, globus pallidus, and thalamus. Clinical consequences are unknown. The possible diagnostic advantages of using gadoxetate disodium in patients requiring repeated scans should be weighed against the potential for deposition of gadolinium in the brain and other tissues. Consider the sodium content (11.7mg/ml) for patients on controlled sodium diet. **Interactions:** Potent OATP inhibitors could cause drug interactions reducing the hepatic contrast effect. No clinical data exists to support this theory. Elevated levels of bilirubin or ferritin can reduce the hepatic contrast effect of Primovist. Primovist may interfere with serum iron determinations for up to 24 hours after administration. **Pregnancy & lactation:** There are no data from use in pregnant women. Animal studies have shown reproductive toxicity at repeated high doses. Should not be used in pregnancy unless clinical condition of the woman requires the use of Primovist. Gd-containing contrast agents are excreted into breast milk in very small amounts. Continuing or discontinuing breast feeding for 24 hours after administration should be at discretion of the doctor and lactating mother. Animal studies did not indicate impairment of fertility. **Undesirable effects:** (please refer to the Contra-indications and the Warnings and Precautions sections). Usually mild to moderate and transient. The most serious adverse reaction is anaphylactoid shock. Delayed allergoid reactions (hours later up to several days) are rare. **Common** - headache, nausea. **Uncommon** - vertigo; paraesthesia; increased blood pressure; dyspnoea*; respiratory distress; rash; back pain; chest pain, injection site reactions; fatigue. Rare .akathisia; bundle

branch block; palpitation; maculopapular rash; malaise. Additionally, altered laboratory tests and transient QT prolongation were reported. **Frequency not known** – Hypersensitivity / anaphylactoid reaction (including shock*, pharyngolaryngeal oedema); tachycardia and restlessness. *Life-threatening and/or fatal cases have been reported post marketing. Prescribers should consult the SmPC in relation to other side effects. **Overdose:** In excessive inadvertent overdose, monitor patient including cardiac monitoring (for possible induction of QT prolongation); remove by haemodialysis. However there is no evidence that haemodialysis is suitable for prevention of nephrogenic systemic fibrosis (NSF). **Incompatibilities:** Do not mix Primovist with other medicinal products. **Legal Category:** POM **Package Quantities & Basic NHS Costs:** 1 x 10ml pre-filled syringe £96.10. **MA number:** PL 00010/0555. **Further information available from:** Bayer plc, 400 South Oak Way, Reading RG2 6AD, United Kingdom. Telephone: 0118 206 3000. **Date of preparation:** November 2019.

*Primovist is a registered trademark of the Bayer Group.

Adverse events should be reported.
Reporting forms and information can be found at
<https://yellowcard.mhra.gov.uk> or search for MHRA
Yellow Card in Google Play or Apple App Store .
Adverse events should also be reported to Bayer plc.
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Email: pvuk@bayer.com