**Supplementary Table 1. Comparison of various ultrasound contrast agents**

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| **Parameter** | **SonoVue/Lumason** | **Definity/Luminity** | **Optison** | **Sonazoid** |
| Manufacturer | Bracco Imaging S.p.A. | Lantheus Medical Imaging Inc | GE Healthcare | GE Healthcare  /Daiichi Sankyo |
| Approval indication(s) | LVO/EBD, breast,\* liver,\* vascular,\* urinary tract | LVO/EBD, breast,\* liver,\* vascular\* | LVO/EBD | Myocardial perfusion,\* liver,\* breast\* |
| Countries available | North America, Europe, Brazil, Asia | North America, Europe, Australia, Asia | North America, Europe | Japan, South Korea, Norway, Taiwan, China |
| Shell/gas | Phospholipid/sulfur hexafluoride | Phospholipid/perflutren | Albumin/perflutren | Phospholipid/ perfluorobutane |
| Contraindications | Hypersensitivity to sulfur hexafluoride or any inactive ingredient | Hypersensitivity to perflutren | Hypersensitivity to perflutren, blood, blood products | Egg allergy |
| Vial supplied | 10 mL, vial containing 25 mg powder 5 mL saline | 2 mL vials | 3 mL vials | 16 mL of perflubutane microbubbles in one vial 2 mL sterile water for injection |
| Storage | Room temperature | 2–8°C | 2–8° C | Below 25˚C |
| Typical doses | 2 mL of reconstituted agent | Weight based bolus (10 mL/kg) or infusion rate of 4.0 mL/m of 1.3 + 50 mL saline | 0.5 mL | Weight based 15 mL/kg or 0.12 mL MB/kg |
| Administration  recommendation | Bolus  Bolus dose can be repeated once  Doses varies depending on age and indication | Bolus or infusion  Dose varies based on organ being imaged | Rate not exceed 1 mL/s, Max dose in 10 m: 5 mL, Max dose for one study: 8.7 mL | Bolus or infusion |
| MI | MI ≤ 0.8 | MI ≤ 0.8 | Safety of MI > 0.8 has  not been tested | MI ≤ 0.8 |
| Application notes | Approved for use in pediatric populations  Reconstitution by hand mixing | Bolus or infusion | Resuspend by hand mixing | Bolus or infusion |
| Bolus and infusion dosing are used, although package insert only describes bolus dosing | Requires 45 s activation on VialMix. Hand agitation thereafter if being used > 5 m after activation | Bolus and infusion dosing are used | Re-injection can be used for Kupffer phase imaging |

\*Only in certain countries. Adapted from Chang, 20186 and Frinking *et al*., 2020.7 EBD, endocardial border definition; LVO, left ventricular opacification; MB, microbubble; MI, mechanical index.

References

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