



### **Supplementary material**

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**Supplementary Table. Common techniques for image-guided breast localisation in Hong Kong.**

<b>Equipment</b>	<b>Approximate cost per device per dose, HKD</b>	<b>Implantation duration</b>	<b>Strengths</b>	<b>Limitations</b>
Wire <sup>1-6</sup> <ul style="list-style-type: none"> <li>• Delivery system: 16-to-20-gauge needle</li> <li>• Wire: 3-15 cm</li> </ul>	\$100-\$500	<ul style="list-style-type: none"> <li>• Placed the same day or less commonly a day before the operation</li> </ul>	<ul style="list-style-type: none"> <li>• Well established</li> <li>• Low cost</li> <li>• No radioactivity</li> <li>• No minimum spacing for multiple lesions or bracketing</li> <li>• No depth limit for detectability</li> <li>• The only device that can be placed under MRI guidance</li> </ul>	<ul style="list-style-type: none"> <li>• Scheduling challenges</li> <li>• Increased risk of syncope due to prolonged presurgical fasting</li> <li>• External component constrains the surgical approach, impacts cosmesis</li> <li>• Risk of wire dislodgement, transection or fracture</li> <li>• Patient discomfort</li> </ul>
Intraoperative ultrasound <sup>2,3,6</sup> <ul style="list-style-type: none"> <li>• Ultrasound machine with multi-frequency probe (7-18 MHz)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>• Allows continuous intraoperative margin assessment</li> <li>• Reduces re-excision</li> </ul>	<ul style="list-style-type: none"> <li>• Requires sonography training</li> <li>• Limits to sonographically visible targets</li> </ul>
ROLL <sup>3,4,6-10</sup> <ul style="list-style-type: none"> <li>• Injection of tracer via a needle</li> </ul>	\$1,000	<ul style="list-style-type: none"> <li>• Injected the same day or a day before the operation</li> </ul>	<ul style="list-style-type: none"> <li>• Allows simultaneous occult lesion localisation and sentinel lymph node mapping by single tracer injection (SNOLL)</li> </ul>	<ul style="list-style-type: none"> <li>• Radiation exposure to patients and staff</li> <li>• Radioactivity regulations</li> <li>• Risk of inadvertent intraductal injection</li> </ul>

	<ul style="list-style-type: none"> <li>• Gamma probe detector and console</li> <li>• Geiger counter: detecting accidental leakage</li> </ul>				<ul style="list-style-type: none"> <li>• Scheduling challenges as tracer decays with time</li> </ul>
Radar reflectors <sup>1-6,8-13</sup>	<ul style="list-style-type: none"> <li>• Delivery system: 16-gauge needle; 5 cm, 7.5 cm or 10 cm</li> <li>• Marker: 12 mm (standard) or 8 mm (mini); antennae made of nitinol alloy</li> <li>• Surgical probe detector and console</li> </ul>	\$6,500	<ul style="list-style-type: none"> <li>• Can be placed &gt;30 days before operation</li> </ul>	<ul style="list-style-type: none"> <li>• Scheduling flexibility</li> <li>• Long-term implantation</li> <li>• No radioactivity</li> <li>• Minimal MRI artefact</li> <li>• Licensed to localise axillary lymph nodes</li> </ul>	<ul style="list-style-type: none"> <li>• Adjacent dense object and halogen light may affect its detection</li> <li>• 6-cm depth limitation for detection</li> <li>• At least 2 cm apart for multiple reflectors</li> <li>• Nickel allergy</li> <li>• Micro-impulse radar signal may interfere with cardiac implants</li> <li>• Reflector may be disabled by electrocautery</li> <li>• Risk of antenna transection</li> </ul>

<p>Magnetic seeds<sup>1-6,10,11</sup></p>	<ul style="list-style-type: none"> <li>• Delivery system: 18 gauge; 7 cm or 12 cm</li> <li>• Device: 5 mm; made of low nickel stainless steel</li> <li>• Surgical probe detector and console</li> </ul>	<p>\$3,900</p>	<ul style="list-style-type: none"> <li>• Can be placed &gt;30 days before operation</li> </ul>	<ul style="list-style-type: none"> <li>• Scheduling flexibility</li> <li>• Long-term implantation</li> <li>• No radioactivity</li> <li>• Licensed to localise axillary lymph nodes</li> <li>• Can use with magnetic tracer for sentinel lymph node localisation</li> </ul>	<ul style="list-style-type: none"> <li>• Use of non-ferromagnetic surgical instruments</li> <li>• 3 to 4 cm depth limitation for detection</li> <li>• At least 2 cm apart for multiple seeds</li> <li>• 4 to 6 cm MRI susceptibility artefact</li> <li>• Contraindicated in patient with pacemakers or implanted chest wall devices</li> <li>• Reaction to beeswax in terminal plug</li> </ul>
<p>RFID tags<sup>1-6,10,11</sup></p>	<ul style="list-style-type: none"> <li>• Delivery system: 12-gauge needle; 5 cm, 7 cm or 10 cm</li> <li>• Device: 11 mm; a ferrite rod wrapped in copper with a microprocessor enclosed in a</li> </ul>	<p>\$4,500 (inclusive of the single-use probe)</p>	<ul style="list-style-type: none"> <li>• Can be placed &gt;30 days before operation</li> </ul>	<ul style="list-style-type: none"> <li>• Scheduling flexibility</li> <li>• Long-term implantation</li> <li>• No radioactivity</li> <li>• Unique identification number for each tag</li> <li>• Pencil-sized surgical probe allows smaller incisions</li> </ul>	<ul style="list-style-type: none"> <li>• 3-cm (loop detector) or 6-cm (probe detector) depth limitation for detection</li> <li>• At least 2 cm apart for multiple tags</li> <li>• 2-cm MRI susceptibility artefact</li> <li>• Large size</li> <li>• Not intended for use in patients with cardiac implants</li> </ul>

polypropylene  
capsule

- Single-use  
probe detector,  
reusable hand-  
held loop  
detector and  
console

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Abbreviations: HKD = Hong Kong dollars; MRI = magnetic resonance imaging; N/A = not applicable; RFID = radiofrequency identification; ROLL = radioguided occult lesion localisation; SNOLL = sentinel node and occult lesion localisation.

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