Australasian College
for Emergency Medicine

Key Considerations When Purchasing a New Ultrasound Machine

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Key Considerations When Purchasing a New Ultrasound Machine

In contrast to ultrasound machines used within Medical Imaging Departments, point of care units require much greater portability, durability, and ease of use amongst a range of ultrasound users. For these reasons, there are multiple unique factors that should be considered when deciding which ultrasound machine(s) to add to your department.

1 **Number of machines needed.** A primary consideration when making a new purchase is the quantity of ultrasound machines required for the department. The number of trainees in the department is a key factor in how many machines are required. For example, smaller departments with less than 10 trainees would typically require 1-2 to meet their clinical and training requirements, 20 trainees would typically require 2-4 ultrasound machines, with larger departments likely requiring 4 or more machines.

2 **Buy in bulk.** Since many manufacturers offer discounts for the purchase of multiple units, the need to update outdated or damaged existing machines within a department should be considered. Liaising with other departments (Anaesthetics/ Intensive Care/ Obstetrics) may also allow funds to be pooled and provide opportunities for further savings.

3 **Selection of machine size and type.** A wide range of sizes of machines are currently utilised in point-of-care ultrasound and the selection of a cart-based, laptop, wall-mounted, or hand-held unit will vary upon the specific needs of the Emergency Medicine Department. Image quality, size, portability, networking and image storage requirements, battery life, and of course, budget are all factors that will influence which particular style of ultrasound unit/s are purchased. The degree of user experience within a department should also be considered, since many higher end machines may offer unnecessary features that could complicate novice users' experience.

4 **Ease of use.** Machines must be readily available for the emergent patient when required with appropriate transducers and peripherals for timely use. A quick machine boot-up time (from both "sleep" and "off" states) is essential for point of care ultrasound in the Emergency Department. Since power outlets may not be readily available for every scan, a machine with a long battery life should also be sought. Controls should be intuitive and easily accessible to cater to both novice ultrasound users and visiting clinicians who may be unfamiliar with a department's ultrasound machine. The machine itself should be easy to manoeuvre and narrow enough to use in cubicles and resuscitation settings.

5 **Durability.** Despite the best efforts of clinicians, machine damage can still occur following wear and tear or accidental damage. Selecting a machine with proven durability including features, such as durable transducers and the ability to safely stow transducer and power cables, will reduce the likelihood of damage, machine downtime, and subsequent repairs.

6 **Ask around.** The value of seeking opinions from other Emergency Departments cannot be overestimated. Years of experience with a machine's strengths, weaknesses, and after-sales support will always provide more insight than that afforded by a manufacturer's comparatively brief trial period.

7 **Warranty and Servicing.** The duration of a manufacturer's warranty and ongoing service arrangements must be clearly understood prior to the purchase of any ultrasound unit. The degree of warranty coverage for specific faults or accidental damage, such as a transducer or cable damage, should also be sought. Of particular relevance to regional and remote Emergency Departments (many of whom may rely on a single ultrasound unit) is the turnaround time for replacement loan equipment should critical damage or malfunction occur.

8 **Transducer selection.** The purchase of a curvilinear transducer, high-frequency linear transducer, and phased array transducer would cover the vast majority of scanning requirements for most Emergency Departments. Smaller footprint, high-frequency linear transducers may also be purchased for other procedures such as paediatric vascular access. Depending on clinician experience and departmental need, intracavitary transducers, including transvaginal or transoesophageal transducers, could also be considered.

9 **Image transfer and storage.** Ideally, images from any ultrasound machine should be systematic, DICOM compatible, and automatically stored on the hospital's PACS system. Regardless of the size of the ultrasound machine, storage systems should also comply with national data protection regulations. This functionality and compliance of storage and networking systems should be ensured, with any anticipated future networking requirements also being factored into any purchase.

10 **Disinfection and infection control.** Since the arrival of COVID-19, the ability to provide adequate probe disinfection and reduce cross-infection between patients has become more recognised than ever. Clarification of suitable transducer probe covers, and disinfection products should be performed prior to purchase, as should compliance with existing local disinfection procedures, including high-level disinfection. Specific features of the console, such as flat-surfaced keyboards and non-recessed controls are now considered essential features to help facilitate easier cleaning.

11 **Staff training and technical support.** Shortly following delivery, all ultrasound users should receive an in-service regarding the use and optimisation of the new machine. A tailored set-up of the ultrasound unit by the manufacturer should also occur to optimise imaging presets and establish network connections. Further technical assistance, ideally via a sonographer, is considered essential for ongoing support and should be readily accessible to address technical issues and general troubleshooting.

References

1 Tayal VS, Blaivas M, Foster TR. Ultrasound Program Management. Switzerland: Springer International Publishing; 2018.

2 ACEM Guideline, *Ultrasound Education Programs (G25)*

3 ACEM Position Statement, *Use of hand-held ultrasound devices (S798)*

4 ACEM Position Statement, *Ultrasound Transducer Disinfection (S686)*

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