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### Introduction

Intravenous (IV) cannulation is a standard procedure associated with a high failure rate. Tools are available to help identify patients with difficult intravenous access (DIVA). Early identification of DIVA can allow nurses to approach patients with advanced techniques, such as ultrasound (US), and allow for the reduction of IV access failure.

### Background and Significance

Worldwide IV access failure rates are 35 – 50% (Helm et al., 2015). IV access failure can be traumatic for patients and frustrating for nurses. The modified A-DIVA tool can aid in the preemptive identification of patients at increased risk for DIVA. Identifying these patients early allows the nurse to prepare for an individualized approach with advanced techniques such as US. US guided IV placement in patients with DIVA has been known to reduce failure rate, increase patient satisfaction, and improve patient care (Loon et al., 2018).

### Clinical Question

In the peri-operative setting, did the development and implementation of a vascular access management program, including the modified A-DIVA tool and ultrasound, successfully identify patients at high risk for DIVA, and did the use of ultrasound assist staff in obtaining IV access?

### The Modified A-DIVA tool

Authors Loon et al., (2019 created the below tool.

Questions	Yes = 1
Is there a known history of a difficult intravenous access?	
Do you expect a failed first attempt or a difficult intravenous access?	
Is there an inability to identify a dilated vein by palpating the upper extremity?	
Is there an inability to identify a dilated vein by visualizing the upper extremity?	
Has the largest dilated vein a diameter less than 3 millimeters?	
TOTAL SCORE:	

- Score of 0 to 1 = 4% risk of first attempt failure
- Score of 2 to 3 = 37% risk of first attempt failure
- Score of 4 to 5 = 94% risk of first attempt failure

### Methodology

**Project Design:** Quality improvement initiative

**Protect Setting:** The pre-operative department in a 300-bed acute care community hospital.

**Population:** 45 registered nurses.

- Intervention:** A protocol was developed using a step-wise approach in obtaining vascular access which was adopted by the facility.
- Didactic education and simulation-based training occurred
  - Implementation occurred over 6 weeks and included use the vascular access management protocol, the modified A-DIVA tool, and ultrasound guidance.
  - The level of risk was identified, and the nurses followed the below tool.



### Results

Descriptive statistics were used to interpret the data and are displayed as the mean, standard deviation, and percentages

### Discussion

This program improved the quality of care provided by offering nurses a tool to identify patients with DIVA and by providing the nurses with advanced techniques in IV placement.

- The Modified-ADIVA tool helped nurses identify patients at an increased risk for failed first attempt.
- Ultrasound was under utilized by nurse as they did not feel competent in its use.
- The nurses felt the program would be sustainable.
- Overall, the nurses were satisfied with the program and will continue to use the modified A-DIVA tool.

### Implications

**Clinical Practice:** Improved identification of DIVA and introduced US use

**Healthcare Policy:** Highlighted the need for increased support in data dissemination and to increase early adaptation of evidence-based data

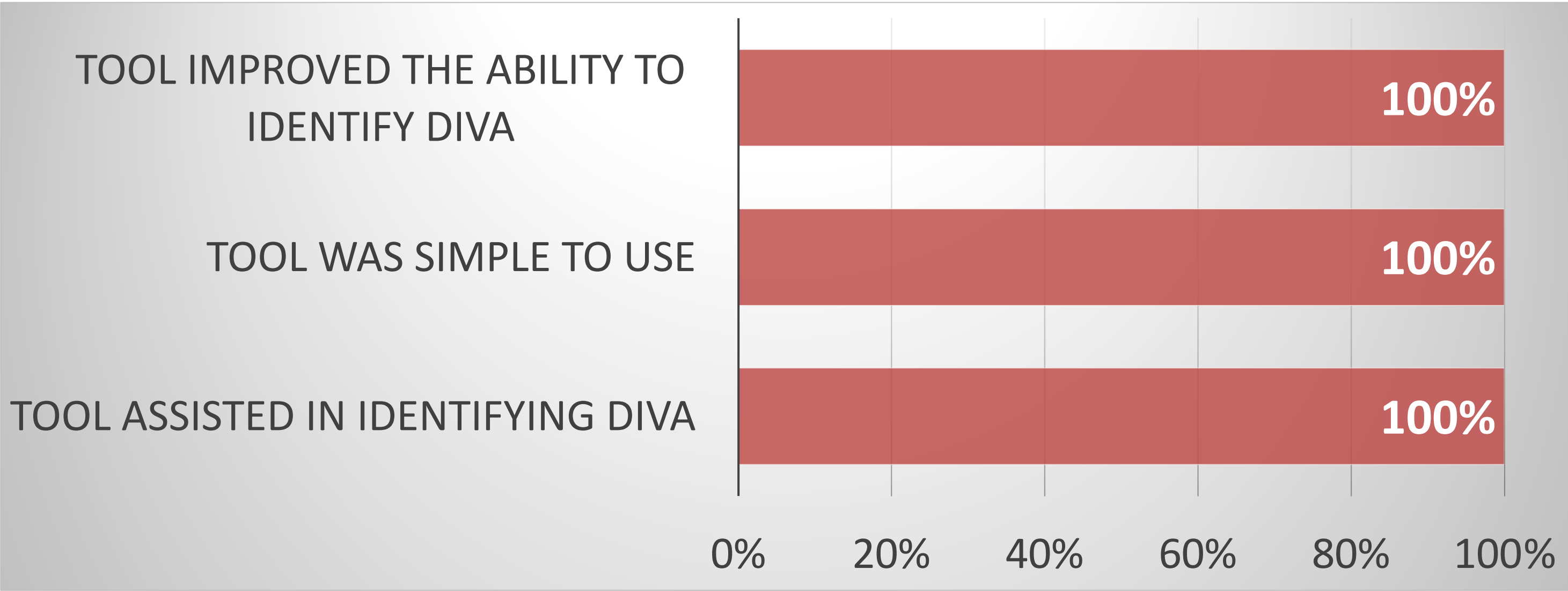
**Quality and Safety:** Implemented a standardized approach and introduced the use of US

**Education:** Showcased the need for system-wide education and the need for better information dissemination.

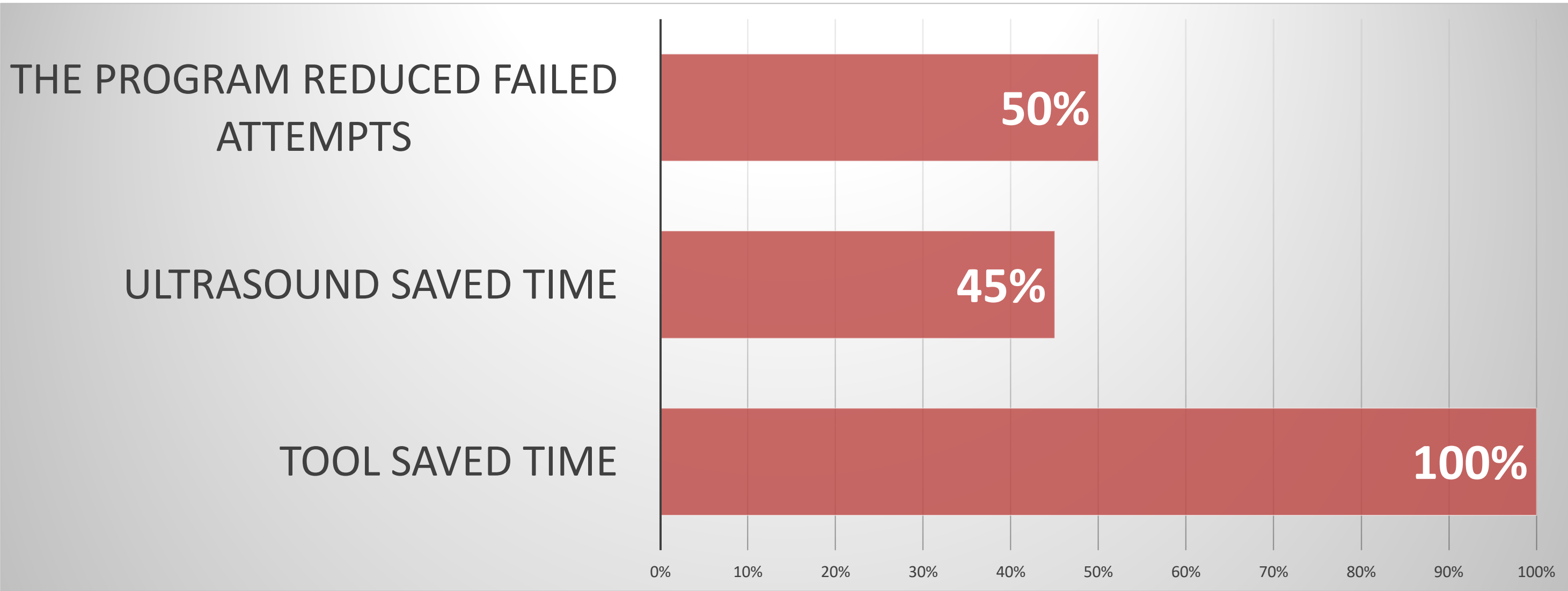
**Sustainability:** The modified A-DIVA tool can be put into place across the healthcare system. Further education will be vital to increase the uptake of ultrasound use.

**Scholarship:** Project and poster board presentation. Research council presentation. Journal of Radiology Nursing submission.

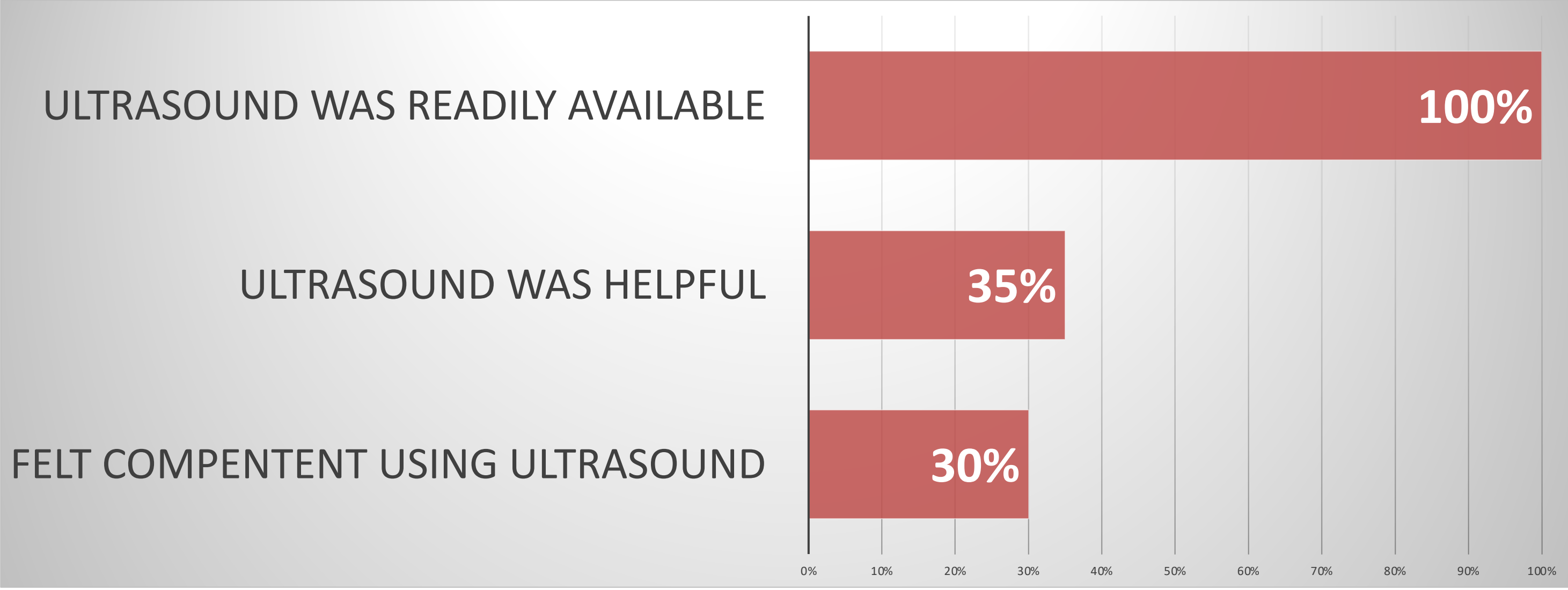
### Usefulness of the Modified A-DIVA



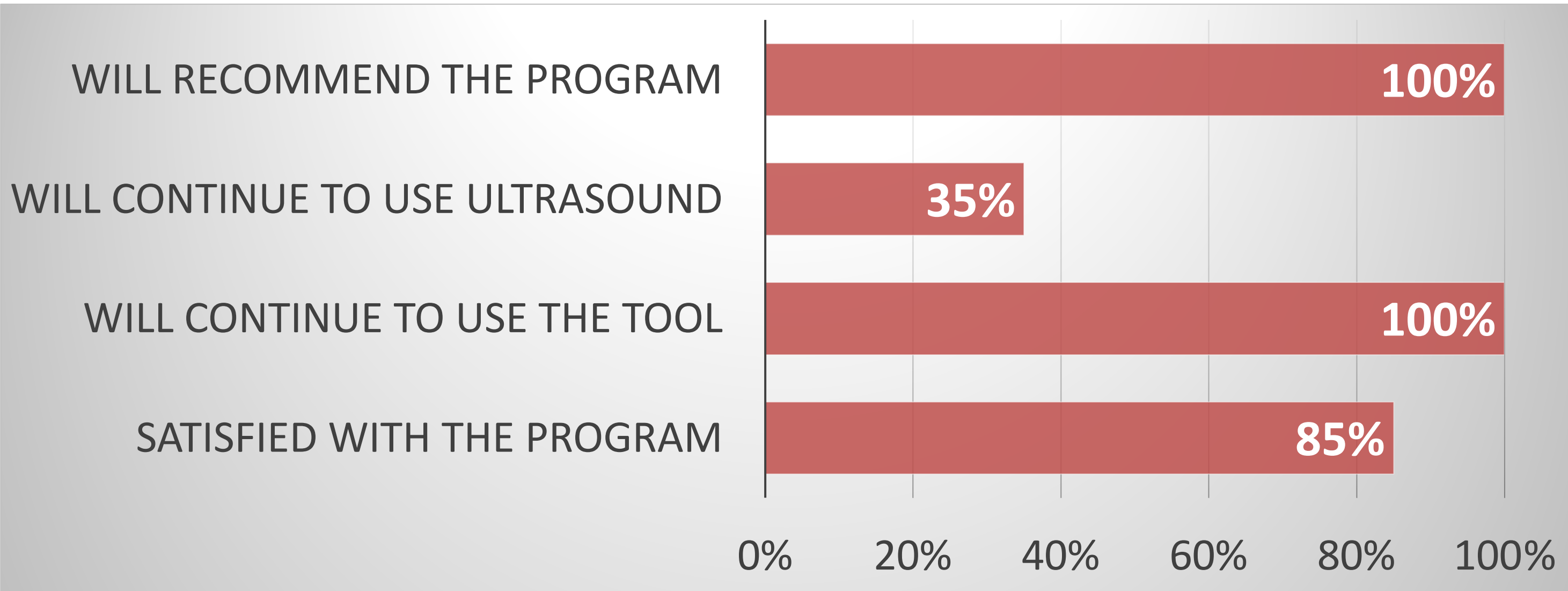
### Impact on Productivity



### Usefulness of Ultrasound



### Program Sustainability



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### References

