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Introduction

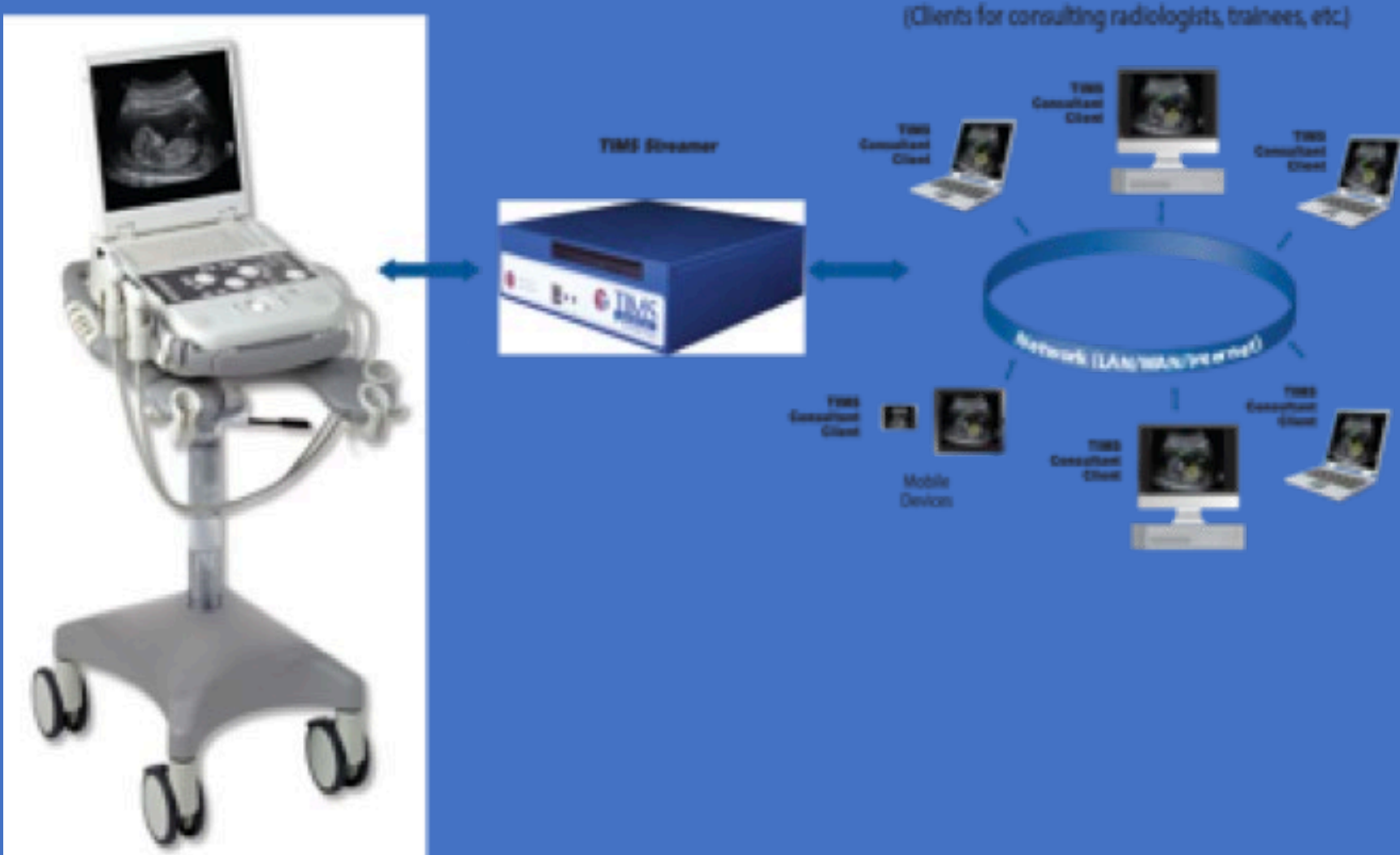
Trainees require successful mentoring and teaching in order to progress and develop skills in gynaecology ultrasound scan (USS) techniques, to achieve a level of competence to enable safe independent practice. Direct clinical supervision by a skilled ‘trainer’ remains the goal standard and preferred mode of learning, to refine skills in pelvic ultrasound. Supervised procedures allow direct specific, formative feedback, to adjust techniques in real time.

Telementoring, using TIMS software (Fig 1) offer a solution to tackle barriers limiting access to gynaecology experts out of hours, through providing an accessible, interactive platform for remote supervision of trainees.^{1,2} The software enables experts to visualise and provide direct real-time feedback to trainees performing ultrasound.

Aims

To determine the value of livestream telementoring for transvaginal ultrasound scan (TVUSS) supervision in gynaecology, when compared to current practice in an acute gynaecology unit in a London teaching hospital.

Figure 1. TIMS is a patented, networked FDA approved system to enable ‘Telementoring’, connecting physicians at various locations to view and participate in an operation or diagnostic imaging procedure in real time.



Method

- A prospective audit was conducted to compare the timing of ultrasound scans by trainees in current practice (control cohort, 50 cases), to a trainee-matched series of cases with telementoring (50 cases).
- These cases used technology (TIMS, Chelmsford MA, USA) to real-time livestream the ultrasound scan to a remote supervisor with audio connection between the trainee and trainer.
- Data collected included scan time, time to call for a senior opinion, reason for requesting second opinion, arrival time of expert, whether the diagnosis and management changed as a result of the expert opinion.
- The trainee and trainers involved completed a questionnaire to evaluate usability and perception of the telementoring technology.

Results

- The prospective trainee data collection on TVUSS timing in the control cohort, found:
 - Average time to call for a second opinion was six minutes and
 - Mean wait time 4.4 minutes
 - Range 1 to 35 minutes
 - The average length of the O&G trainee TVUSS was 14.2 minutes.
- Indication for expert review request: 70% to confirm findings (Fig 2)
- 62% (31/50) reported management changed as a result.

- Confirm Findings
- Review Pathology
- Identify Anatomy (Ovaries, Cyst, cervical length)
- Teaching

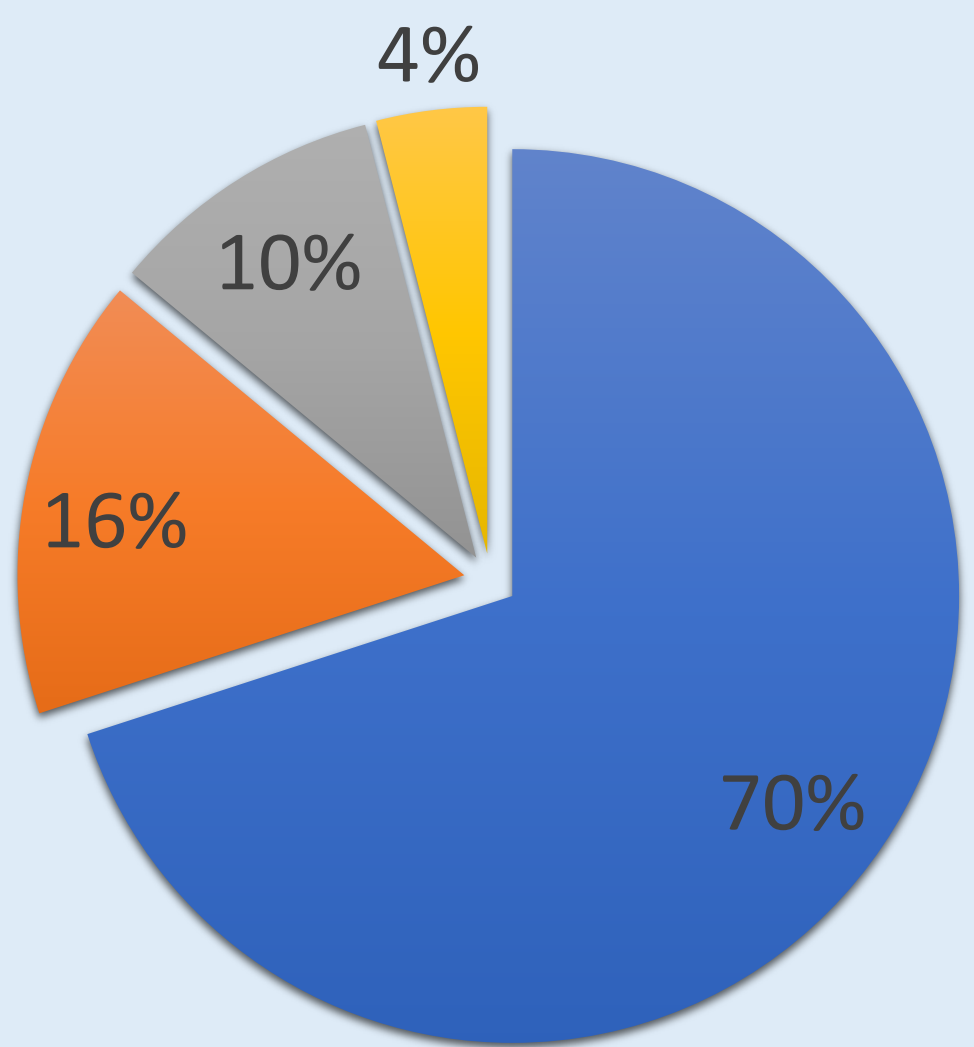


Figure 2. Pie-chart displaying a breakdown of the indication for the primary scanner to request a second opinion in the prospective trainee case analysis

Results

- The evaluation of direct livestreaming supervision involved five supervisors and sixteen trainees.
- All participants were satisfied with image quality
- 14.2% (3/21) had issues with audio.
- Once set up effectively, users were satisfied with the ability to communicate effectively.
- The average length of the O&G trainee TVUSS with telementoring was 9.1 minute.
- Thus, on average a **5.1 minute reduction in the length of the patient scan.**
- All reported they would be confident using the technology for remote supervision, and qualitative feedback was positive.

Conclusion

- This comparative cohort study demonstrates the feasibility and validity of TVUSS telementoring as a supervision tool for live scans.
- The data demonstrates a reduction in the length of the TVUSS when using telementoring, compared to needing to call in a senior colleague midway through the scan, as is current practice.
- The technology holds the potential to set up a hub with one senior supervising multiple sites remotely, improving access to training and access to out of hours TVUSS to optimise patient management.

References

1. Al-Kadi, A. Dyer, D. Ball, C. G. McBeth, P. B. Hall, R. Lan, S. Gauthier, C. Boyd, J. Cusden, J. Turner, C. Hamilton, D. R. and Kirkpatrick, A. W., 2009. User's perceptions of remote trauma teleultrasonography. Journal of Telemedicine and Telecare, 15:251-254.
2. Winn, S. McKeown, P. Lotfipour, S. Maguire, G. A. Youm, J. Wiechmann, W. and Fox, J. C., 2015. Remote, synchronous, hands-on ultrasound education. Telemedicine and e-Health, 21(7):593-7.

Declaration of interests

No competing interests. For more information, please email sughashini.murugesu@nhs.net