Additional economic analysis requested by MTAC committee

There are uncertainties in the model structure and inputs due to the lack of data available and the variations in patient groups and service provision. Two factors that are both highly influential and with high levels of uncertainty are:

- the relative number of reinsertions of the two methods being compared
- the difference in staff time for the two methods being compared.

There are many combinations of these that can change the model from being cost saving to cost incurring, and the most accurate representation will depend on the service being examined.

The sponsor put forward a case that, when comparing blind PICC insertion with Sherlock 3CG TCS (no x-ray) a cost saving of £25.67 per patient would be seen.

The EAC tested a separate set of assumptions and found when comparing blind PICC insertion with Sherlock 3CG TCS (no x-ray) a cost of £9.37 per patient would be incurred.

The EAC analysis presents an alternative set of assumptions, but there is insufficient evidence to be allow absolute certainty over which is correct.

A scenario can be created where the use of Sherlock 3CG TCS is approximately cost neutral, when the following assumptions are made:

- Sherlock 3CG TCS is 100% accurate (since there is no x-ray assessment to compare to).
- Blind PICC placement is 93% accurate (Sponsor submission from Walker et al. 2013) and all reinsertions are by blind PICC.
- Nurse time for blind PICC placement is 62.5min (Sponsor submission from Walker et al. 2013)
- Nurse time for Sherlock 3CG TCS is 57.5 min, a 5 min reduction as there is no requirement for the nurse to interpret the x-ray image.
- The cost of x-ray is 10 minutes of radiologist time (£5.67, from sponsor submission based on Walker et al. 2013) with the addition of 15 minutes for a Band 2 porter (£5.25, Curtis 2013)to transport patient to and from x-ray. This gives total cost of x-ray as (£10.92)
- 16.5% of patients are not suitable for Sherlock 3CG TCS (eg cardiac arrhythmia) and are treated using blind PICC placement (16.5% is Sponsor submission from Adams (2013) with EAC calculation of treatment cost).

For this scenario, the model results are:

	Total cost	Cost difference compared with Sherlock 3CG TCS (no x-ray)
PICC insertion with Sherlock 3CG TCS and no x-ray	£297.71	
Blind PICC insertion with x-ray confirmation	£298.87	£1.16
PICC insertion with Sherlock 3CG TCS with x-ray	£308.29	£9.42
PICC insertion with fluoroscopy[1]	£408.75	£111.27

[1] EAC assumption of £101 for fluoroscopy theatre cost is used

A greater reduction in nurse time using Sherlock 3CG TCS or a greater cost of x-ray would lead to a greater cost saving for Sherlock 3CG TCS (no x-ray). A greater reduction in reinsertion rates due to using Sherlock 3CG TCS would also tend to increase the cost saving.

Given current information, the use of Sherlock 3CG TCS compared to blind PICC insertion using a chest x-ray appears to hover around cost neutral. If evidence became available for outcomes after the initial insertion, such as replacement, complications and adverse events, the cost implications may change. The direction of this potential change is not known.

References

Adams T, (2013) *The Clinical Efficacy of PICC Tip Confirmation using ECG Tip Locator Technology*. Poster Presented at the Association of Vascular Access Annual Scientific Meeting 2013.

Curtis, L. (2013) *Unit Costs of Health and Social Care 2013*, PSSRU. (Hospital based Band 2 Clinical Support Worker used, £21 per hour)

Walker G, Todd A. (2013) *Nurse-led PICC insertion: is it cost effective?* British Journal of Nursing 13;22(19):S9-15.

Walker G. (2013) *Investigation of the health economics of peripherally inserted central catheter (PICC) placement by different staff groups in a district general hospital*. University of Aberdeen, Thesis, BMedSci.