



**London Speech and Language Therapy workforce
scoping project
Phase 2: modelling workforce transformation
example**

Requested by:

Health Education North Central and East London

Final report

Prepared by:

Elena Pizzo, Senior Research Associate, Department of Applied Health Research, UCL

Carol Sacchett, Director of Studies in Speech and Language Therapy, UCL

Steve Morris, Professor of Health Economics, Department of Applied Health Research,
UCL

Date:

15 May 2016

Contents

Executive summary	1
Acknowledgements.....	2
1 Purpose and scope of the project.....	3
2 Background	3
2.1 Local and national context	3
2.2 Teleswallowing	4
3. Methodology	5
4. Current service in Whittington Health.....	5
4.1 Care homes and eligible population in Whittington Health	5
4.2 Speech and language therapists in Whittington Health	6
5. Comparison of service delivery times in Whittington and Blackpool	6
5.1 Clinical activities performed during standard practice in Whittington Health.....	6
5.2 Clinical activities in standard practice and teleswallowing service in Blackpool.....	6
5.3 Travel time.....	7
6. Estimate of the potential impact on SLT time applying the teleswallowing model in Whittington Health	9
6.1 Potential impact of the teleswallowing model on SLT clinical and travel time	9
7. Estimate of the potential impact on other staff time applying the teleswallowing model in Whittington Health.....	10
7.1 Total time saved by other staff with the teleswallowing model.....	10
8. Sensitivity analysis	11
9. Monetary value of introducing the teleswallowing model on SLT and other staff workforce and travel costs in Whittington Health	13
9.1 Impact on SLT time and other staff time	13
9.2 Impact on transport cost	13
10. Discussion.....	17
10.1 Summary of main findings and interpretation	17
10.2 Strengths and limitations	17
10.3 Further research	18
11. Conclusion.....	18
References	19
Appendix 1. Questionnaire for Whittington Health	21
Appendix 2. Questionnaire for Blackpool.....	24
Appendix 3. Additional questionnaire for Blackpool	28
Appendix 4. Travel time calculations	30
Appendix 5. Sensitivity analysis tables	31
Appendix 6. Agenda for pay NHS staff (band 1-9)	39
Appendix 7. Travel cost calculations	42

Executive Summary

Background

Our previous research has shown there is a significant level of unmet need for SLT services in London currently, and that this gap will increase over the next ten years as a joint consequence of an upward trend in clinical need and a declining trend in total workforce provision. One approach to managing current and predicted unmet need is workforce transformation, and increased and innovative use of technologies has been suggested as a way of meeting demands placed on SLT services. We model the impact of a specific technology-based workforce transformation project on the SLT workforce in London. We focus on a novel teleswallowing model for the assessment of swallowing problems in residents of nursing or residential homes, which make up a significant proportion of all referrals to community-based SLT settings. Pilot studies undertaken in Blackpool have shown that the diagnostic accuracy of teleswallowing was equal to standard practice, and there were savings in terms of reduced SLT time spent in arranging visits, travelling and carrying out face-to-face assessments.

Aim

The aim of this study was to evaluate the impact of introducing a novel teleswallowing assessment model for patients in care homes requiring swallowing assessments into an equivalent community-based SLT service in North London.

Methods

We compared the teleswallowing model to standard practice. We used the data from the Blackpool pilot studies relating to impact on the SLT workforce in terms of FTE SLT time savings. We applied these data to the Whittington Health community-based based SLT service for long-term conditions in order to model the potential impacts on workforce productivity and capacity, were the same teleswallowing assessment model to be introduced. As with the Blackpool project, we considered data relating only to swallowing referrals from nursing or residential homes. We evaluated the impact on SLT time undertaking swallow assessments and travelling to and from the care homes, care home staff time, and travel costs. We undertook sensitivity analyses to evaluate the impact of assumptions made.

Results

In our base case we calculated that introducing the teleswallowing model could free up a total of 10.38 weeks SLT time in one year, and 1.9 weeks of care home staff time. The total monetary value of the time and travel costs saved was -£8,335. Savings were achieved in all sensitivity analyses, in the range -£ 3,633 to -£10,225.

Conclusions

Introducing a teleswallowing model of care for patients in care homes requiring swallow assessments into a community SLT service in North London can produce real savings in SLT time. These savings could be spent elsewhere addressing current unmet needs for SLT services.

Acknowledgements

We would like to thank the following people who have contributed to this project:

Veronica Southern and Elizabeth Boaden for their time and support, for giving us access to their reports and data from the Blackpool pilot and extension projects, and for providing useful guidance at the start of this project.

The Whittington Health adult speech and language therapy service, in particular Judith Jackson. Lucie Hogger and Michelle Humphrey, for their time and support, for enabling access to relevant data and for providing data and other helpful information about the London context.

Kamini Gadhok and Rebecca Veazey from RCSLT for identifying a relevant workforce transformation project and facilitating contacts for data collection.

1. Purpose and scope of the project

Health Education North Central and East London (HENCEL) commissioned University College London (UCL), in partnership with the Royal College of Speech and Language Therapists (RCSLT), to carry out a scoping project of the London speech and language therapy (SLT) workforce. Phase 1 of the project, completed in July 2015 (1), provided detailed information about the current London SLT workforce, both NHS and non-NHS, and quantified the current and predicted levels of unmet need for SLT services in the London area up to 2025.

In Phase 2 of the project, we model the impact of a specific workforce transformation project on the SLT workforce in London, in terms of its potential to address unmet need by increasing SLT productivity and capacity. Following discussion with HENCEL and RCSLT, the workforce transformation project selected was an innovative teleswallowing service that has been successfully piloted in another part of England (2, 3). Further details of this service and findings from the pilot study are provided in Section 2.2.

The aim of this project is to evaluate the potential impact on SLT time of introducing the teleswallowing service into an equivalent London service as that in the pilot study, namely, the Whittington Health community-based SLT service providing intervention as part of the long-term conditions care pathway. We will not undertake a full cost-effectiveness analysis, which would also consider other costs and benefits, such as impact on the non-SLT workforce, and the cost of obtaining and using a new telehealth technology, including hardware costs, training costs and other setup costs for the new technology. Our evaluation is based on the assumptions that: a) the required infrastructure and training is already in place; and b) the projected future supply of SLTs in London (measured in FTEs) remains constant so current resourcing of services in Whittington Health will remain as at present.¹

2. Background

2.1 Local and national context

The findings from Phase 1 of the workforce scoping project indicate that there is a significant level of unmet need for SLT services in London currently, and that this gap will increase over the next ten years as a joint consequence of an upward trend in clinical need (client demand) and a declining trend in total workforce provision (supply).

One area in which clinical need for SLT is predicted to increase, both in London and across the UK, is in the assessment and management of people with long-term conditions, including stroke, dementia and a range of progressive neurological conditions. The number of people living with complex disabilities as a result of these conditions is predicted to rise (4). This is due to both an increasingly ageing population² and increased survival rates due to medical advances, particularly in relation to stroke care in London. A concurrent drive to reduce hospital admissions and length of stay has resulted in a substantial increase in

¹ It should be noted that Phase 1 of the workforce scoping project identified a declining trend in the total SLT workforce supply in London. It is also unclear at this stage what impact the changes to AHP student funding arrangements will have on future workforce supply.

² The elderly population in London is projected to grow rapidly. The over-65s are likely to increase by 46% (almost 600,000) to reach 1.85 million by 2029. The over-90s population is expected to double to 91,000 (London Medicine and Healthcare, 2015). It is estimated that about 110,500 people with dementia are currently living in London and that almost 5000 new cases will be diagnosed in London annually (Alzheimer's Society, 2014).

referrals to community-based services and a higher number of early discharges to care home settings of people with complex disabilities.

Survey and workshop findings from phase 1 of the project indicate that most referrals to community SLT services for adults with long-term conditions are for assessment and management of swallowing problems (dysphagia). London SLTs reported concerns about the impact on capacity within the current workforce to manage not only the increase in swallowing referrals, but also the significant communication difficulties experienced by these clients. Dementia was highlighted as a particular area of concern, due to a recent increase in the number of communication referrals (possibly in response to the Prime Minister's challenge on dementia) (5).

One approach to managing current and predicted unmet need is workforce transformation. The NHS Five Year Forward View (5YFV, 2014) (6) sets out a clear vision of the transformation required in healthcare delivery, calling for new ways of working within and across professionals. AHPs are challenged to adopt new working practices, including increased and innovative use of technologies in order to make more efficient and effective use of scarce clinical resources. This theme is echoed in Health Education England's mandate for 2015 (sections 6.52 and 6.53). (7). Enhanced health in care homes is singled out in the 5YFV as a care model that can benefit from such transformation initiatives. The specific workforce transformation initiative selected for this project (teleswallowing) addresses several of the above issues.

2.2 Teleswallowing

The "Teleswallowing augmentative service delivery model: *Remote Assessment for Rapid Response to Swallowing Difficulties*" (2) is an example of a successful workforce transformation project carried out by Blackpool Teaching Hospitals NHS Foundation Trust Speech and Language Therapy Department. This service was developed specifically for the assessment of swallowing problems in residents of nursing or residential homes, which make up a significant proportion of all referrals to community-based SLT settings in both Blackpool and London. Early identification, assessment and management of swallowing difficulties in the community are key to improved patient outcomes, as well as prevention of unnecessary complications which might require hospital admission, such as aspiration pneumonia or malnutrition (8).

A pilot project by Boaden in 2014 (2) compared standard community practice for swallowing assessment (triage, care home visit by SLT, face-to-face assessment by SLT) with the teleswallowing assessment model, which allows for remote assessment by the SLT via a tablet computer, with a trained carer or health professional with the patient. The results showed that the diagnostic accuracy of teleswallowing was equal to standard practice. More specifically, there was 100% agreement between the remote SLT and the face-to-face SLT for modified oral intake. There was 100% agreement on the recommended modified diet consistency and 75% agreement on the recommended modified fluid consistency (overall percentage agreement for diet and fluid recommendations of 87.5%). There was 100% agreement with respect to oral hygiene, use of utensils, use of a large bolus as a therapeutic strategy, number of teaspoons advised, improved sensory stimulation of bolus, empty spoon technique, feeder behaviour and advice regarding admission to the acute care

Boaden's study and a subsequent extension project by Southern (3) also indicated that the introduction of the teleswallowing model had significant positive impacts in terms of cost savings from reduced SLT time spent in arranging visits, travelling and carrying out the face-to-face assessment. They reported a 79.5% reduction in cost per patient and a 66% reduction in time taken to assess each patient compared to home visits. The reduction in time had benefits in terms of SLT productivity and capacity, releasing SLT time to address waiting lists and other staffing pressures. Further benefits included: increased awareness of

swallowing difficulties by other staff in the care homes, with a concomitant improvement in the quality of referrals received; reduced response times from referral to assessment; improved patient outcomes; and reduced risks of complications for clients.

The above findings suggest that teleswallowing assessment model can be viewed as a high impact intervention with potential to make a real difference in terms of both workforce planning and savings in productivity and clinical efficiencies in SLT.

3. Methodology

We used the data from the Blackpool pilot and extension projects relating to impact on the SLT workforce, in terms of FTE SLT time savings. We applied these data to the Whittington Health community based SLT service for long-term conditions (equivalent London service) in order to model the potential impacts on workforce productivity and capacity were the same teleswallowing assessment model to be introduced. As with the Blackpool project, we considered data relating only to swallowing referrals from nursing or residential homes (eligible population).

4. The current service in Whittington Health

4.1 Care homes and eligible population in Whittington Health

In the geographical area covered by Whittington Health there are currently seven nursing/residential homes that receive a swallowing service from SLT.

In Table 1 we summarise the number of patients newly referred for swallowing assessment and the number of follow-up swallowing assessments in the financial year 2014-15 at each of these homes.

The patients considered in this analysis are only those who are permanent residents in the care home; those staying in the care home temporarily, e.g., passing through from acute care services, are excluded.

Table.1 Number of newly referred patients and number of follow up visits for swallowing (2014-15)

	Number of new referrals	Proportion (%)	Number of follow up assessments	Proportion (%)	Total assessments	Proportion (%)
Care home 1	8	7%	5	4%	13	5%
Care home 2	28	26%	53	40%	81	33%
Care home 3	17	16%	14	11%	31	13%
Care home 4	13	12%	15	11%	28	12%
Care home 5	11	10%	12	9%	23	10%
Care home 6	13	12%	19	14%	32	13%
Care home 7	19	17%	15	11%	34	14%
	109	100%	133	100%	242	100%

4.2 Speech and language therapists providing swallowing assessments in Whittington Health

At present there are five speech and language therapists involved in providing standard swallowing practice in the Whittington Health community-based SLT service.

Here is a summary of their actual WTE and band:

- 1.1 WTE therapist (band 6)
- 0.4 WTE therapist (band 7) dedicated to care home only
- 0.1 WTE therapist (band 7) with temporary funding
- 0.65 WTE therapist (band 8)

5. Comparison of service delivery times in Whittington Health and Blackpool

5.1 Clinical activities performed during standard practice in Whittington Health

We administered a questionnaire to the Whittington Health team and we met face-to-face with members of staff to gather information on the time spent on different activities by SLTs and other staff in care homes during the first swallow assessment and subsequent assessments. A copy of the questionnaire is in Appendix 1.

In standard practice in Whittington (SPW) one SLT (band 6-8) would take approximately 75 minutes on average to undertake an initial swallow assessment, not including travel, and 65 minutes for the following sessions (follow-up). This would include preparation of the patient, preparation of equipment and materials, the direct assessment, completing paperwork and liaising with care home staff.

With standard practice, staff from the care home are usually required to work with the SLT to provide support: this usually comprises one experienced nurse and one other home care staff member. Each of them spend 30 minutes (i.e., 60 minutes in total across both members of staff) both in the first assessment and follow-up assessments. A summary of the time required for each activity is provided in Table 2.

5.2 Clinical activities in standard practice and teleswallowing service in Blackpool

We extracted data from the Blackpool pilot report to quantify the mean SLT time spent per patient in standard and teleswallowing practice. We also sent them two questionnaires to ask for clarifications to gather data not accessible from the reports (Appendices 2-3).

For standard practice in Blackpool (SPB) a SLT (band 5-8) spends 90 minutes on average to undertake an initial swallow assessment, not including travel time. This includes locating and identifying the patient in the home, preparing the patient, preparing the equipment and materials to be used as part of the assessment, and reporting recommendations to staff. For the follow-up the same activities require in total 80 minutes on average.

One member of the care home staff (a nurse) is involved in the preparation of the patient and support activities to the SLT. On average this staff member spends 85 minute for the first assessment and 75 minutes for the follow-up. See Table 2 for a summary of the activities and times.

The teleswallowing service in Blackpool (TSB) requires 30 minutes of SLT time in the first swallow assessment and 25 minutes for the follow-up (Table 2). One member of the care home staff is involved

during the teleswallowing consultation for 45 minutes during the first assessment and 40 minutes for the follow up (Table 2).

5.3 Travel time

While standard practice requires that a SLT visits each patient for the first assessment and follow up (where necessary), the teleswallowing service can be performed remotely, saving travel time and transport costs for each assessment.

The travel time for standard practice in Blackpool has been estimated as an average 40 minutes return trip.

In Whittington Health we assessed the travel time from the Caxton House Community Centre (the SLT base) to each care home using the post codes and the distance as per Google Maps³ and TFL⁴. We preferred to use this approach, instead of using an average time across all sites, to take into account the variability in the number of patients seen in each site and the distance of each care home from the SLT base.

Based on the feedback from the questionnaire, on average 90% of SLTs in Whittington Health use the bus and 10% use a bicycle to travel to care homes. We calculated an expected travel time using these proportions. On average a return trip from the SLT base⁵ can take from a minimum of 4 minutes to up to 88 minutes (Table 3). The mean value was 46 minutes, which we have also included in Table 2. In Appendix 4 we provide a detailed description of the calculations.

³ <https://www.google.it/maps>

⁴ <https://tfl.gov.uk/plan-a-journey/>

⁵ It should be noted that the analysis assumes that all journeys start and end at the SLT base. In reality, this is not the case, as SLTs will plan their day to minimise travel time, for example, by seeing clients who live near one another consecutively rather than travelling back to base between each one. Further, they may start/end their journeys from their own homes.

Table. 2 Time for SLT and other staff to perform a first swallow assessment and follow up assessment in standard practice in Whittington Health and Blackpool and teleswallowing in Blackpool

FIRST ASSESSMENT				
SLT Activities (time per patient, minutes)	Standard practice (SPW) Whittington Health	Standard practice (SPB) Blackpool	Tele-swallowing (TSB) Blackpool	Difference SPW-TSB
a) patient preparation	10	10	0	10
b) direct assessment	40	45	20	20
c) paperwork	15	15	5	10
d) liaison with care home staff	10	20	5	5
e) travelling	46	40	0	46
TOTAL TIME	121	130	30	91

Other staff activities (time per patient, minutes)	Standard practice (SPW) Whittington Health ^a	Standard practice (SPB) Blackpool	Tele-swallowing (TSB) Blackpool	Difference SPW-TSB
a) prepare patient	20	15	15	5
b) help during assessment	10	45	20	-10
c) paperwork	10	5	5	5
d) other	20	20	5	15
^a 2 people involved				
TOTAL TIME	60	85	45	15

FOLLOW UP ASSESSMENT				
SLT Activities (time per patient, minutes)	Standard practice (SPW) Whittington Health	Standard practice (SPB) Blackpool	Tele-swallowing (TSB) Blackpool	Difference SPW-TSB
a) patient preparation	10	10	0	10
b) direct assessment	30	35	15	15
c) paperwork	15	15	5	10
d) liaison with care home staff	10	20	5	5
e) travelling	46	40	0	46
TOTAL TIME	111	120	25	86

Other staff activities (time per patient, minutes)	Standard practice (SPW) Whittington Health ^a	Standard practice (SPB) Blackpool	Tele-swallowing (TSB) Blackpool	Difference SPW-TSB
a) prepare patient	20	15	15	5
b) help during assessment	10	35	15	-5
c) paperwork	10	5	5	5
d) other	20	20	5	15
^a 2 people involved				
TOTAL TIME	60	75	40	20

Table 3. Travel time for each care home in one year (2014-2015)

Care Home	Distance (Miles) ^a	Bus (one way) ^b	Mode: bus (90%)	Bike (one way) ^b	Mode: bike (10%)	Total nr visits	Expected time (return trip) for visit
From Caxton House Community Centre		minutes	Average minutes	minutes	Average minutes		minutes
Care home 1	3	30	30	16-18	17	13	57.4
Care home 2	3.6	45-49	47	18-20	19	81	88.4
Care home 3	3	39-43	41	13-17	15	31	76.8
Care home 4	0.8	13-15	12	7	7	28	23
Care home 5	1.2	17-21	19	6	6	23	35.4
Care home 6	1.2	18-23	21	6	6	32	39
Care home 7	0.2	0	0	2	2	34	4
Mean							46
a) Distance in miles as per Google map and TFL b) Travel route calculated using Google Map and TFL							

6. Estimate of the potential impact on SLT time applying the teleswallowing model in Whittington Health

6.1 Potential impact of the teleswallowing model on SLT clinical and travel time

We used the number of first assessments and follow-ups in each care home in Whittington Health to assess the total time spent on clinical activities and travel in one year. Using the times of the teleswallowing model in Blackpool, and assuming the same times can be applied in Whittington Health, we estimated the potential saving in SLT time if Whittington Health were to provide a teleswallowing service instead of standard practice.

We assumed that a full-time SLT works 37.5 hours per week. Based on the current volume of assessments per year, the adoption of the teleswallowing model could potentially save 5 weeks of SLT time for first assessments and more than 6 weeks for follow up assessments, for a total of 10.38 weeks in one year (Table 4).

Table 4. Total SLT time saved in one year with teleswallowing in Whittington Health (using referrals in 2014-15)

First assessments

	Nr first referrals	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	8	75	57	132	30	-102	-819
Care Home 2	28	75	88	163	30	-133	-3735
Care Home 3	17	75	77	152	30	-122	-2071
Care Home 4	13	75	23	98	30	-68	-884
Care Home 5	11	75	35	110	30	-80	-884
Care Home 6	13	75	39	114	30	-84	-1092
Care Home 7	19	75	4	79	30	-49	-931
Total minutes							- 10,416

Follow-up assessments

	Nr follow up	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time difference in one year with tele-swallowing
Care Home 1	5	65	57	122	25	-97	-487
Care Home 2	53	65	88	153	25	-128	-6805
Care Home 3	14	65	77	142	25	-117	-1635
Care Home 4	15	65	23	88	25	-63	-945
Care Home 5	12	65	35	100	25	-75	-905
Care Home 6	19	65	39	104	25	-79	-1501
Care Home 7	15	65	4	69	25	-44	-660
Total minutes							-12,938

TOTAL SLT TIME SAVED (minutes)	-23,355
TOTAL SLT TIME SAVED (weeks)	-10.38

7 Estimate of the potential impact on other staff time applying the teleswallowing model in Whittington Health

7.1 Total time saved by other staff with the teleswallowing model

We used the same approach described above to estimate the difference in time spent by other staff using the teleswallowing model in Whittington. The adoption of the teleswallowing model could potentially save 0.7 weeks for first assessments and 1.2 weeks for follow up activities, for a total of 1.9 weeks in one year (Table 5).

The calculation was performed assuming that, in the standard practice model, two care home staff members are supporting the SLT (as currently happens in Whittington Health) and only one care home staff member is involved in the teleswallowing model (as per Blackpool model). There is no impact on travel time in this calculation.

Table 5. Total time saved by other staff in one year with teleswallowing in Whittington Health (using referrals in 2014-15)

First assessments

	Nr first referrals	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saving in one year with tele-swallowing
Care Home 1	8	60	45	-15	-120
Care Home 2	28	60	45	-15	-420
Care Home 3	17	60	45	-15	-255
Care Home 4	13	60	45	-15	-195
Care Home 5	11	60	45	-15	-165
Care Home 6	13	60	45	-15	-195
Care Home 7	19	60	45	-15	-285
					-1,635

Follow-up assessments

Care Home	Nr follow up	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saving in one year with tele-swallowing
Care Home 1	5	60	40	-20	-100
Care Home 2	53	60	40	-20	-1060
Care Home 3	14	60	40	-20	-280
Care Home 4	15	60	40	-20	-300
Care Home 5	12	60	40	-20	-240
Care Home 6	19	60	40	-20	-380
Care Home 7	15	60	40	-20	-300
					-2,660

TOTAL OTHER STAFF TIME SAVED (minutes)	-4,295
TOTAL OTHER STAFF WEEKS SAVED (weeks)	-1.9

8. Sensitivity analysis

We performed several sensitivity analyses to assess how the time savings changed under different scenarios:

- Scenario 1: The first assessment is performed face to face (standard practice) and the follow-up assessment is a teleswallowing assessment
- Scenario 2: The time per assessment spent on standard practice in Whittington Health is the same as Blackpool for both SLT and other staff, and only one care home staff member is involved in the assessment
- Scenario 3: In standard practice the SLT sees two patients at every care home visit
- Scenario 4: In standard practice the SLT sees three patients at every care home visit
- Scenario 5: Only one care home staff member is involved in standard practice in Whittington Health

- Scenario 6: The first assessment is performed face to face (standard practice) and the follow-up assessment is a teleswallowing assessment but only one care home staff member is involved in Whittington Health

In the following section we present the results of each scenario.

Scenario 1: The first assessment is performed face to face (standard practice) and the follow-up assessment is a teleswallowing assessment

In this case there is no saving in terms of SLT time and other staff time for the first assessment, but there is a saving in SLT time of almost 6 weeks in a year for follow up assessments, and a saving in time for other staff of 1.2 weeks (see Appendix 5 Tables 1 and 2 for the detailed analysis).

Scenario 2: The time per assessment spent on standard practice in Whittington Health is the same as in Blackpool for both SLT and other staff, and only one care home staff member is involved in the assessment

In this case, if teleswallowing were introduced, the SLT time saved is almost 12 weeks in one year (Appendix 5 Table 3) and a total of 4 weeks of other staff time is saved (Appendix 5 Table 4).

Scenario 3: In standard practice the SLT sees two patients at every care home visit

In the base case scenario we assumed that an SLT sees one patient for each home care visit. In this scenario we assume that SLTs can assess two patients every time they visit a home care. Therefore, the travelling time decreases as fewer trips are required to assess the same number of patients during both first assessments and follow-up assessments in one year.

In this case the SLT time saved is more than 6 weeks in one year (Appendix 5 Table 5). There is no impact on other staff time.

Scenario 4: In standard practice the SLT sees three patients at every care home visit

In this scenario we assume that SLTs can assess three patients every time they visit a home care. In this case the SLT time saved is around 5 weeks in a year (Appendix 5 Table 6). There is no impact on other staff time.

Scenario 5: Only one care home staff member is involved in standard practice in Whittington Health

As previously mentioned, the number of care home staff involved in standard practice in Whittington Health and Blackpool is different: two staff in Whittington Health and only one in Blackpool. In this scenario we assume that only one care home staff member is involved in standard practice in Whittington Health for 30 minutes instead of two for 30 minutes each.⁶ This decreases the time spent by other staff in standard practice.

In this case the teleswallowing model would require an additional one week of other staff time in one year (Appendix 5 Table 7).

⁶ Note that based on current practice in Whittington Health only 30 minutes of other staff time is unlikely to be sufficient, hence this scenario may not be realistic.

Scenario 6: The first assessment is performed face to face (standard practice) and the follow-up assessment is a teleswallowing assessment but only one care home staff member is involved in Whittington Health

In this case we assume the first assessment is performed face to face and the follow up with teleswallowing, as in scenario 1, but only one member of care home staff is involved in standard practice for 30 minutes, as in scenario 5 (though see footnote 6 above).

In this case, as in scenario, 1 the saving in SLT time is almost 6 weeks in a year (Appendix 5 Table 8) but the teleswallowing model would require an additional 1.32 weeks of other staff time (Appendix 5 Table 9).

9. Monetary value of introducing the teleswallowing model on SLT and other staff workforce and travel costs in Whittington Health

9.1 Impact on SLT time and other staff

We estimated the impact in monetary terms of the SLT time saved if the teleswallowing model were adopted in Whittington Health. We used Agenda for Change NHS salary scales⁷ by band (see Appendix 6) for 2015-2016 to estimate the weekly salary costs for SLT and other staff time.

According to the information extracted from the Blackpool reports and the interviews and questionnaires administered to Blackpool and to Whittington Health, both standard practice and teleswallowing could be performed by a band 5- 8 SLT). The care home staff involved in both models are assumed to be band 1-5.

We calculate the monetary value of the time saved with the teleswallowing model using SLT and other staff costs (by band) for the base case and each of the six scenarios in Tables 6 and 7. The combined results for the base case and each scenario are in Table 8.

In the base case, the adoption of the teleswallowing model could potentially save more than 10 weeks of SLT time in a single year, which has a monetary value of £6,945. An extra 2 weeks of other staff time could be saved, with a monetary value of £737, giving a total monetary value of the time saved of -£7,682. Across the different scenarios the range is -£9,571 to -£3,338

9.2 Impact on transport cost

We estimated the number of bus trips undertaken in one year for first swallow assessments and follow-up assessments performed in each care home. Assuming the cost of a return bus trip is £3.00 (as per TfL), we estimated the total cost savings in a single year if teleswallowing were to be introduced. We evaluated the impact on travel costs for the base case and the six scenarios. A full description of the costing methodology for transport is in Appendix 7.

On average in the base case, the adoption of the teleswallowing model could save £653 in travel costs per year (Table 9), assuming all journeys start and end at the SLT base. Savings varied from £217-£653 between the six additional scenarios considered.

The combined monetary value across staff and travel costs is in Table 10. In the base case the monetary value of the saving is -£8,335. This ranges from -£ 3,633 to -£10,225 across the six scenarios.

⁷ <https://www.healthcareers.nhs.uk/about/careers-nhs/nhs-pay-and-benefits/agenda-change-pay-rates>

Table 6. Estimate of the monetary value of SLT time saved

	Base case		Scenarios 1 and 6		Scenario 2		Scenario 3		Scenario 4	
	Time saved per SLT (in weeks) per year	Monetary value	Time saved per SLT (in weeks) per year	Monetary value	Time saved per SLT (in weeks) per year	Monetary value	Time saved per SLT (in weeks) per year	Monetary value	Time saved per SLT (in weeks) per year	Monetary value
SLT qualified band 5 (point 23)	-10.38	-£5,681	-5.75	-£3,147	-11.99	-£6,564	-6.15	-£3,367	-5.34	-£2,924
SLT band 6	-10.38	-£6,085	-5.75	-£3,371	-11.99	-£7,031	-6.15	-£3,607	-5.34	-£3,133
SLT band 7	-10.38	-£7,237	-5.75	-£4,009	-11.99	-£8,362	-6.15	-£4,290	-5.34	-£3,726
SLT band 8a (point 33-38)	-10.38	-£8,776	-5.75	-£4,861	-11.99	-£10,140	-6.15	-£5,202	-5.34	-£4,518
Average		-£6,945		-£3,847		-£8,024		-£4,116		-£3,575

Table 7. Estimate of the monetary value of other staff time saved

	Base case		Scenario 1		Scenario 2		Scenarios 5 and 6	
	Time difference (in weeks) per year	Monetary value	Time difference (in weeks) per year	Monetary value	Time difference (in weeks) per year	Monetary value	Time difference (in weeks) per year	Monetary value
Other staff band 1-2	-1.91	-£595	-1.18	-£368	-4.01	-£1,249	1.32	£411
Other staff band 3	-1.91	-£670	-1.18	-£415	-4.01	-£1,406	1.32	£462
Other staff band 4	-1.91	-767	-1.18	-£475	-4.01	-£1,610	1.32	£529
Other staff band 5	-1.91	-£915	-1.18	-£566	-4.01	-£ 1,921	1.32	£631
average		-£737		-£456		-£1,547		£508

Table 8. Combined estimate of the monetary value changes in SLT and other staff time

STAFF	Base case		Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5		Scenario 6	
	time	cost	time	cost	time	cost	time	cost	time	cost	time	cost	time	cost
SLT (band 5-8)	- 10.38	-£ 6,945	-5.75	-£3,847	-11.99	-£8,024	- 6.15	-£ 4,116	-5.34	-£ 3,575	- 10.38	-£6,945	-5.75	-£3,847
Other staff (band 1-5)	-1.91	-£737	-1.18	-£456	-4.01	-£1,547	- 1.91	-£737	-1.91	-£737	1.32	£508	1.32	£508
Total saving		-£7,682		-£4,304		-£9,571		-£ 4,854		-£4,312		-£6,436		-£3,338

Table 9. Impact of teleswallowing on transport costs

	Base case		Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5		Scenario 6	
	Trips saved	Cost	Trips saved	Cost	Trips saved	Cost	Trips saved	Cost	Trips saved	Cost	Trips saved	Cost	Trips saved	Cost
Bus trips	219	£653	99.00	£294	219	£653	109	£326	73	£217	219	£653	99.00	£294

Table 10. Total impact of teleswallowing on staff and transport cost

	Base case	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Total monetary value of savings	-£8,335	-£4,598	-£10,225	-£5,180	-£4,530	-£ 7,089	-£ 3,633

10. Discussion

10.1 Summary of main findings and interpretation

The aim of this study was to evaluate the impact of introducing a novel teleswallowing assessment model into Whittington Health, using data from a pilot study in Blackpool. This was in the context of (1) there being significant unmet need for SLT services in London, and (2) increased and innovative use of technologies have been mooted as a way of meeting demands placed on SLT services. There is some, though as yet limited, evidence that the teleswallowing model is equally as effective as standard practice with regard to patient outcomes. From a costing perspective, the adoption of the teleswallowing model by Whittington Health could potentially save more than 10 weeks of SLT time in a year, with a monetary value of £6,945. If we also take into account the impact on other staff, 2 weeks of their time could be saved at a value of £737. An extra £653 could be saved in transport costs. In all of the scenarios considered, there would be a saving in SLT time if the teleswallowing model was introduced. Hence, the total monetary value of the time and travel costs saved was -£8,335. Savings were achieved in all sensitivity analyses, in the range -£ 3,633 to -£10,225.

Given the local and national context of this study – especially the high levels of unmet need for SLT services – the findings demonstrate how SLT time might be saved and reorganised to meet unmet clinical needs elsewhere in the local economy. Hence, the monetary values are not cash savings to SLT services, but represent the value of the time that could be freed up and used by SLTs to undertake alternative activities, thereby increasing capacity and productivity. In the current example, the time saved on swallowing assessments could be redirected towards working with clients and others to improved communication outcomes. This is particularly relevant in the context of a) predicted increases in the number of older people with long term conditions being admitted to long term residential care, and b) policy drivers such as the 5YFV (2014) and the Prime Minister’s Dementia Challenge 2020, which place an emphasis on communication with these client groups.

10.2 Strengths and limitations

The main strength of our study is that it is based on real data from a pilot study that has been undertaken previously to evaluate a SLT care home teleswallowing model. In addition, data on the impact of the teleswallowing model in terms of SLT and other staff time were combined with real service-level data from a SLT service in North London. There are several weaknesses. First, we assumed in our base case that the time spent providing the teleswallowing service in Whittington Health would be the same as in Blackpool, even though services are configured differently in the two areas – for example, the time spent on standard practice is different in the two areas and staffing is different. In a sensitivity analysis we evaluated what would happen if standard practice in Whittington Health was the same as in Blackpool, and the time savings were not appreciably different from the base case scenario. Second, in the absence of data our travel costs have been estimated on the basis that SLTs travel from the SLT base to the care home and back again. In reality, SLTs will plan their day to minimise travel time, for example, by seeing clients who live near one another consecutively rather than travelling back to base between each visit. In addition, they may start/end their journeys from their own homes. Hence, we may have over-estimated the travel costs associated with standard practice and therefore overestimated the cost savings associated with teleswallowing. Note that these costs represent a small component of the monetary value of the savings associated with the teleswallowing model. Third, we assumed that service provision would remain constant if the teleswallowing model was adopted. This was assumed with regard to the number of assessments needed, the number of SLTs available to provide those services, and the mode of transport used. Fourth, we have mainly considered the impact of the service transformation on SLT time; there are likely to be other costs and benefits that have not been considered fully. For example, if a teleswallowing

model were introduced, some initial expenditure is likely to be needed in terms of IT equipment and software including ongoing maintenance, plus training of care home staff in the teleswallowing procedure. We have included some non-SLT inputs, for example travel costs and time spent by care home staff, but our analysis does not constitute a full economic evaluation. Fifth, our calculations have been made within a single community based SLT service in London. It has not been possible to extrapolate beyond this service to the rest of London due to lack of data on the number of London-wide swallow assessments within care homes and associated travel. The time savings and monetary values presented in our analysis would feasibly be larger if the analysis were extrapolated to the whole of London

10.3 Further research

Further research would be beneficial to undertake a full evaluation of the teleswallowing model. This could involve: (1) a multi-centre randomised controlled trial to evaluate the effectiveness of the intervention on care processes and client outcomes; (2) a full economic analysis to calculate the costs and benefits of the intervention to the NHS and society; and, (3) a qualitative process evaluation to consider the barriers to and facilitators for implementing the teleswallowing model.

11. Conclusion

Introducing a teleswallowing model of care for patients in care homes requiring swallowing assessments into a community SLT service in North London can produce real savings in SLT time. These savings could be spent elsewhere addressing current unmet needs for SLT services.

References

1. Sacchett, C., Morris, S., Utley, M., Pizzo, E., Verhoef, T., Gadhok, K., Amos, D., & Veazey, R. (2015) *London Speech and Language Therapy workforce scoping project: Final Report*. Unpublished. Submitted to HENCEL July 2015.
2. Boaden, E. (2014). *Swallowing Assessment and Management via Telemedicine: Service Evaluation Report*. Unpublished. Prepared for Blackpool Teaching Hospitals NHS Foundation Trust Speech and Language Therapy Department.
3. Southern, V. (2015). *Speech and Language Therapy Department Teleswallowing Extension Project, August 2014 - March 2015*. Blackpool Teaching Hospitals NHS Foundation Trust.
4. Department of Health (2010). *Equity and Excellence – Liberating the NHS*.
5. *Prime Minister's challenge on dementia 2020* (2015) Department of Health/Cabinet Office. Available from: <https://www.gov.uk/government/publications/prime-ministers-challenge-on-dementia-2020/prime-ministers-challenge-on-dementia-2020> [Accessed March 2015]
6. NHS England. (2014) *The NHS Five Year Forward View*. Available at: <http://www.england.nhs.uk/ourwork/futurenhs/> [Accessed November 2014].
7. Department of Health (2015). *Delivering high quality, effective, compassionate care: Developing the right people with the right skills and the right values*. A mandate from the Government to Health Education England: April 2015 to March 2016
8. NICE: Swallowing screening and nutrition management <http://www.nice.org.uk/guidance/qualitystandards/stroke/swallowingscreeningandnutritionmanagement.jsp> [accessed April, 2014].

Appendices

1. Questionnaire for Whittington Health
2. Questionnaire for Blackpool
3. Additional questionnaire for Blackpool
4. Travel time calculations
5. Sensitivity analysis
6. Agenda for pay NHS staff (band 1-9)
7. Travel cost calculations



London Speech and Language Therapy workforce scoping project

Phase 2: modelling workforce transformation example

Data request to Whittington

Prepared by:

Elena Pizzo, Senior Research Associate
Steve Morris, Professor of Health Economics
Carol Sacchett, Director of Studies in Speech and Language Therapy, UCL

Department of Applied Health Research, UCL

Date:

12 February 2016

1. How many nursing/residential homes are there in the Whittington SLT service?

8 care homes, but only 7 with SLT service _____

2. How many adults with dysphagia are referred from care homes in Whittington over 1 year (eligible population)?

109 new referrals, 133 follow up

3. How many FTE SLTs are currently involved in providing standard swallowing assessment Whittington? (indicate how many of each band)

Band 6 _1.1 WTE_(also involved in other services)_____

Band 7 _0.4 WTE_(dedicated to care home only)_ + 0.1 (temporary budget)_____

Band 8 0.65 WTE (also involved in other services)

4. How many extra people (e.g. care home nurses) per patient are involved in standard swallowing assessment in a care home (excluding the SLT)?

2 people: 1 registered nurse + 1 home care worker

5. How much time (on average) do these extra people (the care home nurses, not the SLTs) spend per patient on the following activities in standard swallowing assessment in a care home?

a) Preparation of patient (sitting up the patient, oral hygiene, preparation of equipment, preparation of food): 10_____ minutes

b) Help during the assessment: 5_____ minutes

c) Paperwork (filling in documents): 5_____ minutes

d) Other activities not included above (e.g. giving information to SLT, please describe what) 10_____ minutes

6. How much time (on average) does an SLT spend per patient on the following activities in a standard swallowing assessment/therapy in a care home?

a) Preparation of patient (sitting up the patient, oral hygiene, preparation of equipment, preparation of food): 10_____ minutes

b) Assessment: 25-40_____ minutes

c) Paperwork (filling in documents): 10_____ minutes

d) Other activities not included above (e.g. giving information to SLT, please describe what) 15_____ minutes

e) Travelling (two way, return travel to care home): __(depends)_____ minutes

7. What modes of transport are used to travel to care homes to provide swallowing assessment/therapy? Please record how many times each mode of transport is used on average per 100 visits.

Car ___0___ /100

Bike ___10___ /100 (2 therapists)

Walking _____ /100 (rarely)

Bus ___90___ /100 (3 therapists)

Tube _____ /100 (rarely)

Other (please state) _____ /100

8. Over a 6 month period, what proportion of all patients are assessed together during the same visit to the care home?(i.e. an SLT sees more than one patient in the same care home, instead of going multiple times to the same place to assess a single patient. For example, if in 6 months the SLT sees 20 patients, and 16 are seen during the same visit as other patients and 4 are seen in individual visits then 16/20 (80%) are assessed together)

Not many, it is very difficult to say. Better to assume every visit is a single patient visit

9. What is the average number of patients that an SLT typically assesses during a single visit to a care home? (e.g. on average the SLT sees 3 patients per visit)

Very rare (max 2-3) _____

10. How many sessions of swallowing therapy do care home patients with swallowing problems typically receive from an SLT, including the initial assessment delivered by SLT?

1 referral (first assessment) and 2.1 follow up on average _____

Please return this questionnaire to:

Elena Pizzo - Senior Research Associate – Health Economist

Email e.pizzo@ucl.ac.uk

Department of Applied Health Research, UCL

1-19 Torrington Place, London WC1E 7HB

If you have any queries please contact:

Elena Pizzo - Senior Research Associate – Health Economist

Email e.pizzo@ucl.ac.uk

Tel +44(0)20 31083250



**London Speech and Language Therapy workforce
scoping project
Phase 2: modelling workforce transformation
example**

Data request to Blackpool

Prepared by:

Elena Pizzo, Senior Research Associate
Steve Morris, Professor of Health Economics
Carol Sacchett, Director of Studies in Speech and Language Therapy, UCL

Department of Applied Health Research, UCL

Date:

12 February 2016

1. Could you please confirm the SLT grade (band) required to perform a standard swallowing assessment in a care home?

SLT Band __6, 7 & 8_ (Blackpool had no Band 5s in post for the projects but we would send qualified band 5 SLTs into care homes if available)_____

2. Could you please confirm the SLT grade (band) required to perform a teleswallowing assessment/therapy?

SLT Band __6, 7 & 8__ (Blackpool had no Band 5s in post for the projects but we would send qualified band 5 SLTs into care homes if available)_____

3. Are SLTs required to attend a specific training course to be able to perform teleswallowing assessment/therapy?

Yes
No

If yes, can you please describe what the training consists of and how much time in total each SLT will spend attending the training course (e.g. 3 hours, or 3 sessions of one hour, one day)?

I've said no as it's not a specific course. All it consists of is familiarisation to use the software ie to connect to a nursing home, and to orientate to viewing a patient remotely rather than physically and to instruct the staff at the care home (supported implementation rather than training)

4. How many extra people (e.g. care home nurses) per patient are involved in a standard swallowing assessment/therapy in a care home (excluding the SLT)?

___potentially 1 person _____

5. How much time (on average) do these extra people (the care home nurses, not the SLTs) spend per patient on the following activities in a standard swallowing assessment/therapy in a care home?

a) Preparation of patient (sitting up the patient, oral hygiene, preparation of equipment, preparation of food) Guess: 15 ___ minutes – SLT often prepares the drinks etc

b) Help during the assessment:

about 45-50_ minutes – ie the duration of the home visit, useful for hand-over of information, demonstration of posture, intake, therapy/facilitation/compensation techniques etc

c) Paperwork (filling in documents): Guess: _____5-10___ minutes –

d) Other activities not included above (e.g. giving information to SLT, please describe what)

Guess: _____20___ minutes – triage phone call to SLT, entry in patient notes

6. How many extra people (e.g., care home nurses) are involved in teleswallowing assessment/therapy (excluding the SLT)?

___1 trained nurse _____

7. How much time (on average) do these extra people (the care home nurses, not the SLTs) spend per patient on the following activities in a teleswallowing assessment/therapy?

a. Preparation of patient (sitting up the patient, oral hygiene, preparation of equipment, preparation of food) _Guess: 15_____ minutes

b. Help during the assessment:
_average 26_____ minutes – this is the average time taken to deliver a Teleswallowing assessment (a review can take 14 minutes)

c. Paperwork (filling in documents):
_____0-5_____ minutes – the Teleswallowing proforma is completed throughout the assessment contemporaneously – nurse may enter in patient notes after assessment

d. Other activities not included above (e.g. giving information to SLT, please describe what)
_____5-10__ minutes – preparation/scheduling phone call, referral information

8. On average, according to the evaluation reports, the standard care home assessment takes an SLT 90 minutes per patient. Which activities are included in this time? For how long?

a) Preparation of patient Yes No ___10 minutes

b) Direct assessment Yes No ___45__ minutes

c) Paperwork Yes No ___15-20__ minutes

d) Liaison with care home staff Yes No ___20_ minutes
(e.g. information gathering, reporting findings/recommendations)

9. According to the evaluation reports, SLTs spend 40 minutes travelling to a care home to deliver a standard assessment/therapy there. Are these 40 minutes travelling time included in the 90 minutes SLT assessment time?

Yes No

10. Each time the SLT provides a standard swallowing assessment in a care home, how many patients on average does he/she typically assess in one visit? (e.g. 3 patients in one care home visit?)

SLT rarely sees more than 1 patient (90 mins) in a care home and then has to travel to next venue. Possibly 2- 3 (90 mins each + travel) could be seen in a morning or afternoon session (3 hours 30 mins)._____

11. Each time the SLT provides a teleswallowing assessment, how many patients on average does he/she typically assess in one session? (e.g. 3 patients in the same session?)

__in one 90 minute session (average home visit), the SLT could deliver 3 Teleswallow assessments (three fold increase)_so 7 Teleswallow full assessments could be achieved in a 3.5 hour session as no travel is required/reduced preparation (more reviews could be delivered as an average review took 14 minutes)_____

Please return this questionnaire to:

Elena Pizzo - Senior Research Associate – Health Economist

Email e.pizzo@ucl.ac.uk

Department of Applied Health Research, UCL

1-19 Torrington Place, London WC1E 7HB

If you have any queries please contact:

Elena Pizzo - Senior Research Associate – Health Economist

Email e.pizzo@ucl.ac.uk

Tel +44(0)20 31083250



**London Speech and Language Therapy workforce
scoping project
Phase 2: modelling workforce transformation
example**

Data request to Blackpool (part 2)

Prepared by:

Elena Pizzo, Senior Research Associate

Department of Applied Health Research, UCL

Date:

23 March 2016

Please complete the following table with the time spent by SLT and Other staff in first assessment and follow up activities:

	First assessment	First assessment	Follow up	Follow up
SLT Activities (time per patient)	Standard treatment Blackpool	Teleswallowing Blackpool	Standard follow up Blackpool	Teleswallowing FU Blackpool
a) patient preparation	10	0	10	0
b) direct assessment	45	20	35	15
c) paperwork	15	5	15	5
d) liaison with care home staff	20	5	20	5
e) travelling (return)	40	0	40	0
TOTAL TIME	130	30	120	25

	First assessment	First assessment	Follow up	Follow up
Other people activities (time per patient)	Standard treatment Blackpool	Teleswallowing Blackpool	Standard follow up Blackpool	Teleswallowing FU Blackpool
a) prepare patient	15	15	15	15
b) help during assessment	45	20	35	15
c) paperwork	5	5	5	5
d) liaison with SLT	20	5	20	5
e) travelling	0	0	0	0
TOTAL TIME	85	45	75	40

Please return this questionnaire to:

Elena Pizzo - Senior Research Associate – Health Economist

Email e.pizzo@ucl.ac.uk

Department of Applied Health Research, UCL

1-19 Torrington Place, London WC1E 7HB

If you have any queries please contact:

Elena Pizzo - Senior Research Associate – Health Economist

Email e.pizzo@ucl.ac.uk

Tel +44(0)20 31083250

Appendix 4

Travel time and cost for each home care

Home care	Miles	Bus (one way)	Mode: bus (90%)	Bike (one way)	Mode: bike (10%)	New referrals	Nr of follow up	Total nr visits	Expected time (return trip) for visit	Total time (return) for each home care	2 patients are seen in one visit	3 patients are seen in one visit	Expected return cost (return ticket £3)
Caxton House Community Centre		minutes	aver min	minutes	aver min								
To:													
Care Home 1	3	30	30	16-18	17	8	5	13	57.4	746.2	28.7	19.1	£ 2.70
Care Home 2	3.6	45-49	47	18-20	19	28	53	81	88.4	7160.4	44.2	29.5	£ 2.70
Care Home 3	3	39-43	41	13-17	15	17	14	31	76.8	2380.8	38.4	25.6	£ 2.70
Care Home 4	0.8	13-15	12	7	7	13	15	28	23	644	11.5	7.7	£ 2.70
Care Home 5	1.2	17-21	19	6	6	11	12	23	35.4	814.2	17.7	11.8	£ 2.70
Care Home 6	1.2	18-23	21	6	6	13	19	32	39	1248	19.5	13.0	£ 2.70
Care Home 7	0.2	0	0	2	2	19	15	34	4	136	2	1.3	£ 2.70

The distance of each home care from the SLT base has been calculated using the postcodes of each site and using Google Map and TFL to simulate a trip by bus or by bicycle.

Times are then doubled to take into account of the return travel time.

For each site we also calculated the total number of visits in one year to estimate the total travel time, assuming that every time the SLT visits a care home s/he can only assess one patient at a time.

For the sensitivity analysis we also calculated the number of trips required if a SLT can assess more than one patient for each home care visit, so for example s/he might assess 2 or 3 patients in the same care home but travelling there only one time.

Appendix 5. Sensitivity analyses

Scenario 1: The first assessment is performed face to face (standard practice) and the follow-up assessment is a teleswallowing assessment

Table 1. SLT time saved if in the teleswallowing model, the first assessment is performed face to face and the follow-up assessment is a teleswallowing assessment

Follow-up assessments

	Nr follow up	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	5	65	57	122	25	-97	-487
Care Home 2	53	65	88	153	25	-128	-6805
Care Home 3	14	65	77	142	25	-117	-1635
Care Home 4	15	65	23	88	25	-63	-945
Care Home 5	12	65	35	100	25	-75	-905
Care Home 6	19	65	39	104	25	-79	-1501
Care Home 7	15	65	4	69	25	-44	-660
Total time (min)							-12,938

TOTAL SLT TIME SAVED (minutes)	-12,938
TOTAL SLT SAVED (weeks)	-5.75

Table 2. Time saved by Other Staff if in the teleswallowing model, the first assessment is performed face to face and the follow-up assessment is a teleswallowing assessment

Follow-up assessments

	nr follow up	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	5	60	40	-20	-100
Care Home 2	53	60	40	-20	-1060
Care Home 3	14	60	40	-20	-280
Care Home 4	15	60	40	-20	-300
Care Home 5	12	60	40	-20	-240
Care Home 6	19	60	40	-20	-380
Care Home 7	15	60	40	-20	-300
Total time (min)					-2,660

TOTAL OTHER STAFF TIME SAVED (minutes)	-2,660
TOTAL OTHER STAFF TIME SAVED (weeks)	-1.2

Scenario 2: The time per assessment spent on standard practice in Whittington Health is the same as in Blackpool for both SLT and other staff and only one care home staff member is involved in the assessment

Table 3. SLT time saved if the time per assessment spent on standard practice in Whittington Health is the same as in Blackpool and only one care home staff member is involved in the assessment

Initial assessments

	nr first referrals	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	8	90	57	147	30	-117	-939
Care Home 2	28	90	88	178	30	-148	-4155
Care Home 3	17	90	77	167	30	-137	-2326
Care Home 4	13	90	23	113	30	-83	-1079
Care Home 5	11	90	35	125	30	-95	-1049
Care Home 6	13	90	39	129	30	-99	-1287
Care Home 7	19	90	4	94	30	-64	-1216
Total time							-12,051

Follow-up assessments

	nr follow up	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	5	80	57	137	25	-112	-562
Care Home 2	53	80	88	168	25	-143	-7600
Care Home 3	14	80	77	157	25	-132	-1845
Care Home 4	15	80	23	103	25	-78	-1170
Care Home 5	12	80	35	115	25	-90	-1085
Care Home 6	19	80	39	119	25	-94	-1786
Care Home 7	15	80	4	84	25	-59	-885
Total time							-14,933

TOTAL SLT TIME SAVED (minutes)	-26,985
TOTAL SLT TIME SAVED (weeks)	- 11.99

Table 4. Time saved by other staff if the time per assessment spent on standard practice in Whittington Health is the same as in Blackpool and only one care home staff member is involved in the assessment

Initial assessments

	Nr first referrals	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saving in one year with tele-swallowing
Care Home 1	8	85	45	-40	-320
Care Home 2	28	85	45	-40	-1120
Care Home 3	17	85	45	-40	-680
Care Home 4	13	85	45	-40	-520
Care Home 5	11	85	45	-40	-440
Care Home 6	13	85	45	-40	-520
Care Home 7	19	85	45	-40	-760
Total time(min)					-4,360

Follow-up assessments

	Nr follow up	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saving in one year with tele-swallowing
Care Home 1	5	75	40	-35	-175
Care Home 2	53	75	40	-35	-1855
Care Home 3	14	75	40	-35	-490
Care Home 4	15	75	40	-35	-525
Care Home 5	12	75	40	-35	-420
Care Home 6	19	75	40	-35	-665
Care Home 7	15	75	40	-35	-525
Total time (min)					-4,655

TOTAL OTHER STAFF TIME SAVED (minutes)	-9,015
TOTAL OTHER STAFF TIME SAVED (weeks)	-4

Scenario 3: In standard practice the SLT sees two patients at every care home visit

Table. 5 SLT time saved if in standard practice the SLT sees two patients at every care home visit

Initial assessments

	nr first referrals	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	8	75	14.4	89	30	-59	-475
Care Home 2	28	75	22.1	97	30	-67	-1879
Care Home 3	17	75	22.6	98	30	-68	-1149
Care Home 4	13	75	7.1	82	30	-52	-677
Care Home 5	11	75	11.3	86	30	-56	-619
Care Home 6	13	75	12.0	87	30	-57	-741
Care Home 7	19	75	1.2	76	30	-46	-877
Total time (min)							-6,417

Follow-up assessments

	nr follow up	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	5	65	23	88	25	-63	-315
Care Home 2	53	65	24	89	25	-64	-3402
Care Home 3	14	65	19	84	25	-59	-829
Care Home 4	15	65	7	72	25	-47	-704
Care Home 5	12	65	9	74	25	-49	-586
Care Home 6	19	65	11	76	25	-51	-975
Care Home 7	15	65	1.2	66	25	-41	-618
Total time (min)							-7,428

TOTAL SLT TIME SAVED (minutes)	-13,844
TOTAL SLT TIME SAVED (weeks)	- 6.15

Scenario 4: In standard practice the SLT sees three patients at every care home visit

Table 6. SLT time saved if with standard practice the SLT sees three patients at every care home visit

Initial assessments

	nr first referrals	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	8	75	12.0	87	30	-57	-456
Care Home 2	28	75	12.6	88	30	-58	-1614
Care Home 3	17	75	12.0	87	30	-57	-970
Care Home 4	13	75	4.1	79	30	-49	-639
Care Home 5	11	75	6.4	81	30	-51	-566
Care Home 6	13	75	7.0	82	30	-52	-676
Care Home 7	19	75	0.6	76	30	-46	-867
							- 5,787

Follow-up assessments

	nr follow up	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	5	65	9.6	75	25	-50	-248
Care Home 2	53	65	10.3	75	25	-50	-2665
Care Home 3	14	65	8.2	73	25	-48	-675
Care Home 4	15	65	2.6	68	25	-43	-638
Care Home 5	12	65	3.9	69	25	-44	-527
Care Home 6	19	65	6.2	71	25	-46	-877
Care Home 7	15	65	0.4	65	25	-40	-607
							- 6,237

TOTAL SLT TIME SAVED (minutes)	-12,024
TOTAL SLT TIME SAVED (weeks)	-5.34

Scenario 5: Only one care home staff member is involved in standard practice in Whittington Health

Table 7. Extra time of other staff if one staff member is involved in standard practice in Whittington Health

Initial assessments

	nr first referrals	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time difference in one year with tele-swallowing
Care Home 1	8	30	45	15	120
Care Home 2	28	30	45	15	420
Care Home 3	17	30	45	15	255
Care Home 4	13	30	45	15	195
Care Home 5	11	30	45	15	165
Care Home 6	13	30	45	15	195
Care Home 7	19	30	45	15	285
Total time (min)					1,635

Follow-up assessments

	Nr follow up	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time difference in one year with tele-swallowing
Care Home 1	5	30	40	10	50
Care Home 2	53	30	40	10	530
Care Home 3	14	30	40	10	140
Care Home 4	15	30	40	10	150
Care Home 5	12	30	40	10	120
Care Home 6	19	30	40	10	190
Care Home 7	15	30	40	10	150
Total time (min)					1,330

TOTAL OTHER STAFF EXTRA TIME (minutes)	2,965
TOTAL OTHER STAFF EXTRA TIME (weeks)	1.32

Scenario 6: The first assessment is performed face to face (standard practice) and the follow-up assessment is a teleswallowing assessment but only one care home staff member is involved in Whittington Health

Table 8. SLT time saved if the first assessment is performed face to face and the follow-up assessment is a teleswallowing assessment but only one care home staff member is involved in Whittington Health

Follow-up assessments

	nr follow up	Standard practice time per patient	Travelling time per patient with standard practice	Total time per patient with standard practice	Total SLT time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time saved in one year with tele-swallowing
Care Home 1	5	65	57	122	25	-97	-487
Care Home 2	53	65	88	153	25	-128	-6805
Care Home 3	14	65	77	142	25	-117	-1635
Care Home 4	15	65	23	88	25	-63	-945
Care Home 5	12	65	35	100	25	-75	-905
Care Home 6	19	65	39	104	25	-79	-1501
Care Home 7	15	65	4	69	25	-44	-660
Total time							-12,938

TOTAL SLT TIME SAVED (minutes)	-12,938
TOTAL SLT TIME SAVED (weeks)	-5.75

Table 9. Time saved by other staff if the first assessment is performed face to face and the follow-up assessment is a teleswallowing assessment but only one care home staff member is involved in Whittington Health

Initial assessments

	Nr first referrals	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time difference in one year with tele-swallowing
Care Home 1	8	30	45	15	120
Care Home 2	28	30	45	15	420
Care Home 3	17	30	45	15	255
Care Home 4	13	30	45	15	195
Care Home 5	11	30	45	15	165
Care Home 6	13	30	45	15	195
Care Home 7	19	30	45	15	285
Total time (min)					1,635

Follow-up assessments

	nr follow up	Time per patient with standard practice	Time per patient with tele-swallowing	Time difference per patient with tele-swallowing	Total time difference in one year with tele-swallowing
Care Home 1	5	30	40	10	50
Care Home 2	53	30	40	10	530
Care Home 3	14	30	40	10	140
Care Home 4	15	30	40	10	150
Care Home 5	12	30	40	10	120
Care Home 6	19	30	40	10	190
Care Home 7	15	30	40	10	150
Total time (min)					1,330

TOTAL OTHER STAFF EXTRA TIME (minutes)	2,965
TOTAL OTHER STAFF EXTRA TIME (weeks)	1.32

Appendix 6. Agenda for change pay rate by band 2015-2016

<https://www.healthcareers.nhs.uk/about/careers-nhs/nhs-pay-and-benefits/agenda-change-pay-rates>

Agenda for change - pay rates

2015-2016

This pay system covers all staff except doctors, dentists and very senior managers. Each of the nine pay bands has a number of pay points. Staff will normally progress to the next pay point annually until they reach the top of the pay band. In addition to basic pay, there is also extra pay for staff who work in high cost areas such as around London.

Band 1

Point 2	£	15,251.00
Point 3	£	15,516.00
Average	£	15,383.50

Possible roles at band 1 - domestic support worker, housekeeping assistant, driver and nursery assistant.

Band 2

Point 2	£	15,251.00
Point 3	£	15,516.00
Point 4	£	15,944.00
Point 5	£	16,372.00
Point 6	£	16,800.00
Point 7	£	17,351.00
Point 8	£	17,978.00
Average	£	16,458.86

Possible roles at band 2 - domestic team leader, security officer, secretary/typist and healthcare assistant.

Band 3

Point 6	£	16,800.00
Point 7	£	17,351.00
Point 8	£	17,978.00
Point 9	£	18,152.00
Point 10	£	18,653.00
Point 11	£	19,217.00
Point 12	£	19,655.00
Average	£	18,258.00

Possible roles at band 3- emergency care assistant, clinical coding officer, support, time and recovery worker, estates officer and occupational therapy assistant.

Band 4

Point 11	£	19,217.00
Point 12	£	19,655.00
Point 13	£	20,348.00
Point 14	£	21,052.00
Point 15	£	21,692.00
Point 16	£	21,909.00
Point 17	£	22,458.00
Average	£	20,904.43

Possible roles at band 4 - assistant practitioner, audio visual technician, pharmacy technician, dental nurse and theatre support worker.

Band 5

Point 16	£	21,909.00
Point 17	£	22,458.00
Point 18	£	23,363.00
Point 19	£	24,304.00
Point 20	£	25,298.00
Point 21	£	26,302.00
Point 22	£	27,361.00
Point 23	£	28,462.00
Average	£	24,932.13

Possible roles at band 5 (includes newly qualified professionals) - operating department practitioner (ODP), midwife, podiatrist, adult nurse, diagnostic radiographer, practice manager and ICT test analyst)

Band 6

Point 21	£	26,302.00
Point 22	£	27,361.00
Point 23	£	28,462.00
Point 24	£	29,333.00
Point 25	£	30,357.00
Point 26	£	31,383.00
Point 27	£	32,407.00
Point 28	£	33,560.00
Point 29	£	35,225.00
Average	£	30,487.78

Possible roles at band 6 - school nurse, health visitor, senior paramedic, health records officer, clinical psychology trainee and biomedical scientist.

Band 7

Point 26	£	31,383.00
Point 27	£	32,407.00
Point 28	£	33,560.00
Point 29	£	35,225.00
Point 30	£	36,250.00
Point 31	£	37,403.00
Point 32	£	38,683.00
Point 33	£	40,028.00
Point 34	£	41,373.00
Average	£	36,256.89

Possible roles at band 7 - communications manager, estates manager, high intensity therapist, advanced speech and language therapist and theatre team leader (ODP).

Band 8a

Point 33	£	40,028.00
Point 34	£	41,373.00
Point 35	£	43,038.00
Point 36	£	44,703.00
Point 37	£	46,625.00

Point 38	£	48,034.00
average	£	43,966.83

Possible roles at band 8a - consultant prosthetics/orthotist, dental laboratory manager, project and programme management, modern matron (nursing) and nurse consultant (children's nursing).

Band 8b

Point 37	£	46,625.00
Point 38	£	48,034.00
Point 39	£	50,467.00
Point 40	£	53,285.00
Point 41	£	56,104.00
Point 42	£	57,640.00
average	£	52,025.83

Possible roles at band 8b - strategic management, head of education and training, clinical physiology service manager and head orthoptist.

Band 8c

Point 41	£	56,104.00
Point 42	£	57,640.00
Point 43	£	59,606.00
Point 44	£	62,397.00
Point 45	£	66,582.00
Point 46	£	68,484.00
Average	£	61,802.17

Possible roles at band 8c - head of human resources, consultant clinical scientist (molecular genetics/cytogenetics) and consultant paramedic.

Band 8d

Point 45	£	66,582.00
Point 46	£	68,484.00
Point 47	£	71,338.00
Point 48	£	74,825.00
Point 49	£	78,629.00
Point 50	£	82,434.00
Average	£	73,715.33

Possible roles at band 8d include estates manager, chief nurse and chief finance manager

Band 9

Point 49	£	78,629.00
Point 50	£	82,434.00
Point 51	£	86,390.00
Point 52	£	90,537.00
Point 53	£	94,883.00
Point 54	£	99,437.00
Average	£	88,718.33

Possible roles at band 9 include consultant psychologist, consultant podiatric surgeon, chief finance manager and director of estates and facilities.

Appendix 7. Calculation of travel costs in one year (base case and scenarios 3 and 4)

	nr fist referrals in a year	nr of visits in a year	nr fist referrals by bus in a year	nr of total visits by bus in a year	nr visits by bus in a year	nr visits by bus in a year	nr visits by bus in a year	cost per return ticket	Total cost in a year	Total cost in a year	Total cost in a year	Total cost in a year
			90%	90%	(Only first)	(2 patients per visit)	(3 patients per visit)		(base case)	(only first assessment)	(2 patients per visit)	(3 patients per visit)
Care Home 1	8	13	7.2	11.7	7.2	5.85	3.90	£3.00	£35.10	£21.60	£17.55	£11.70
Care Home 2	28	81	25.2	72.9	25.2	36.4	24.30	£3.00	£218.70	£75.60	£109.35	£72.90
Care Home 3	17	31	15.3	27.9	15.3	13.95	9.30	£3.00	£83.70	£45.90	£41.85	£27.90
Care Home 4	13	28	11.7	25.2	11.7	12.60	8.40	£3.00	£75.60	£35.10	£37.80	£25.20
Care Home 5	11	23	9.9	20.7	9.9	10.35	6.90	£3.00	£62.10	£29.70	£31.05	£20.70
Care Home 6	13	32	11.7	28.8	11.7	14.40	9.60	£3.00	£86.40	£35.10	£43.20	£28.80
Care Home 7	19	34	17.1	30.6	17.1	15.30	10.20	£3.00	£91.80	£51.30	£45.90	£30.60
	109	242	99	219	99	108.90	72.60		£653.40	£294.30	£326.70	£217.80