

Health care resource use time and cost associated with combination treatments in first-line common epidermal growth factor receptor–mutated advanced non-small cell lung cancer

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Key Takeaway

Despite differences in health care systems between Italy and the UK, SC amivantamab Q4W + lazertinib resulted in substantial HCRU and associated cost savings as well as reduced patient treatment time compared with osimertinib + chemotherapy as first-line treatment for common *EGFR*-mutated advanced NSCLC in Italy and the UK

Conclusions

Over the first year of treatment, SC amivantamab Q4W + lazertinib resulted in 47% and 59% lower overall HCRU time compared with osimertinib + chemotherapy in Italy and the UK, respectively; HCRU costs were 52% and 57% lower with SC amivantamab Q4W + lazertinib versus osimertinib + chemotherapy in Italy and the UK, respectively

SC amivantamab Q4W + lazertinib required less premedication time, less treatment preparation and administration time, and shorter patient chair time compared with osimertinib + chemotherapy

Despite differences in health care systems, data sources, and total HCRU costs, the relative impact of SC amivantamab Q4W + lazertinib was similar between Italy and the UK in reducing the time and costs associated with administration versus osimertinib + chemotherapy; these efficiencies can potentially increase HCP capacity, reduce costs for health care systems, and inform treatment decisions in first-line *EGFR*-mutated advanced NSCLC

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Introduction

- The combination regimens amivantamab + lazertinib and osimertinib + chemotherapy have shown improved outcomes versus osimertinib monotherapy in first-line treatment for epidermal growth factor receptor (*EGFR*)–mutated advanced non-small cell lung cancer (NSCLC)^{1,2}; however, combination regimens add considerations related to administration time and need for health care resources
- Health care systems increasingly aim to optimize efficiency and capacity, whereas patients aim to reduce treatment time; therefore, treatment selection should take into account the health care resource use (HCRU) required for drug administration
- Here, time and costs of HCRU associated with subcutaneous (SC) amivantamab every 4 weeks (Q4W) + lazertinib³ versus osimertinib + chemotherapy are compared to inform health care decision-making

Methods

- A microcosting approach was developed to compare HCRU time and the associated costs for the first year of treatment in a hypothetical cohort focused on the average patient (**Figure 1**)
- Model assumptions for time related to premedications, drug preparation, drug administration, and postadministration monitoring are shown in **Tables 1 and 2**
 - Patient chair time was calculated separately from these factors
- Italian analysis: Time inputs and unit costs were based on hospital sales and consumption data, publicly available sources, and national tariffs, where relevant⁴
- United Kingdom (UK) analysis: Time inputs were based on experts’ interviews and publicly available sources; cost per working hour for health care professionals (HCPs) for the first year of treatment per patient used band 7 for hospital-based clinical specialist nurses and specialist pharmacists and band 4 for hospital-based pharmacy technicians⁵; material costs and incidentals were based on Burcombe et al 2013⁶
- The Italian analysis was based on references and hospital consumption data validated by key opinion leaders, while the UK analysis used a model based on assumptions and references and was validated by key opinion leaders
- Sensitivity analyses were conducted for the UK

Table 1: Premedication assumptions for SC amivantamab Q4W + lazertinib and osimertinib + chemotherapy in Italy and the UK

Premedication frequency and treatment length	HCRU assumption
SC amivantamab Q4W + lazertinib	
Chlorhexidine 4% nail cleaning agent QD × all cycles	
Topical clindamycin 1% lotion QD Week 13+	Italy: Assumes no physician, nurse, or hospital pharmacist time is required; patient self-administers
Ceramide-based moisturizer QD × all cycles	UK: CID1, based on UK HCP feedback; 30 min of nurse time assumed on D1; no HCP time assumed for subsequent cycles
Antibiotics (doxycycline) QD × first 12 weeks	
Anticoagulant (apixaban ^a) QD × first 4 months	
Antihistamine (chlorphenamine ^b) once per cycle × all cycles	
Glucocorticoid (Italy: dexamethasone) Week 1, D1 and D2 ^c	
Antipyretic (paracetamol) once per cycle × all cycles	
Osimertinib + chemotherapy	
Vitamin B12 injection C1 and Q3 cycles thereafter × all cycles (starting 1–2 weeks before pemetrexed)	Italy: Assumes 1 nurse (5 min) and 1 pharmacist (5 min) Q3 months UK: Assumes 1 nurse (10 min)
Folic acid QD × all cycles (starting 1–2 weeks before pemetrexed) ^d	Italy: Assumes no physician, nurse, or hospital pharmacist time is required; patient self-administers UK: CID1, based on UK HCP feedback; 30 min of nurse time assumed on D1; no HCP time assumed for subsequent cycles
Antiemetics (ondansetron) once per cycle × all cycles	
Antiemetics for platinum-based chemotherapy (metoclopramide or branded netupitant and palonosetron) once per cycle × 4 cycles ^e	
Glucocorticoid (dexamethasone) × all cycles (starting 3 days before pemetrexed) ^f	Italy: Assumes 7.5 min of nurse time every cycle UK: No HCP time assumed

^aLow-molecular-weight heparin in Italy; ^bDiphenhydramine in Italy; ^cOnce at first cycle then optional in Italy; ^dThroughout all cycles (starts 2 weeks prior to pemetrexed) and 3 weeks after discontinuation of pemetrexed; ^eOptional and throughout all cycles in Italy; ^fOptional and starts 1 day prior to pemetrexed for 3 days in Italy. C, Cycle; D, Day; HCP, health care professional; HCRU, health care resource use; QD, every 3; Q4W, every 4 weeks; QD, once-daily; SC, subcutaneous; UK, United Kingdom.

Table 2: Treatment preparation, administration, and postadministration assumptions for SC amivantamab Q4W + lazertinib and osimertinib + chemotherapy in Italy and the UK

Assumption	SC amivantamab Q4W + lazertinib	Osimertinib + chemotherapy
Italy		
Drug preparation: fixed HCP time per visit for drug preparation and setup		
Pharmacist ^a	12.5 min	28 min
Pharmacy technician ^b	12.5 min	28 min
Fixed physician time for drug preparation and setup on Week 1 Day 1 (including catheter insertion for IV therapies ^c)	Not required	25.6 min
Drug administration^d		
Cycle 1	5 min	10 min pemetrexed + 30-min gap (including flush) + 60 min carboplatin
Cycles 2–4	5 min	10 min pemetrexed + 30-min gap (including flush) + 30 min carboplatin
Cycle 5 and onward	10 min	10 min pemetrexed
Nurse time ^e	100% of time with patients	50% of time with patients (eg, 100 min × 50%)
Physician time	16.7 min of time with patients	16.7 min of time with patients
Postadministration monitoring^f		
Patient chair time: Cycle 1	2 h	Not required
Nurse time	100% of time with patients	Not required
UK		
Drug preparation^g: fixed HCP time per visit for drug preparation and setup		
Pharmacist ^a	0.6 min	6 min (first 4 cycles) 3 min (subsequent cycles)
Pharmacy technician ^b	5.4 min	54 min (first 4 cycles) 27 min (subsequent cycles)
Drug administration^d		
Cycle 1	5 min	10 min pemetrexed + 30-min gap (including flush) + 60 min carboplatin
Cycles 2–4	5 min	10 min pemetrexed + 30-min gap (including flush) + 30 min carboplatin
Cycle 5 and onward	10 min	10 min pemetrexed
Nurse time ^e	100% of time with patients	50% of time with patients (eg, 100 min × 50%)
Postadministration monitoring^f		
Patient chair time: Cycle 1	2 h	Not required
Nurse time	100% of time with patients	Not required

^aPharmacist time included tasks like screening prescriptions and checking before releasing prescriptions; ^bPharmacy technician time included tasks like dispensing medications; ^cAssuming 51% of patients receiving IV therapy require catheter insertion; ^dFor SC amivantamab Q4W + lazertinib, administration time is based on Summary of Product Characteristics recommendations; for osimertinib + chemotherapy, chemotherapy administration times are based on the National Health Service protocol for NSCLC; ^eHCP time is based on discussion with Italian and UK experts; for the UK, as the SACT assessment time is assumed to be the same for each combination regimen, this time has not been included; ^fBased on discussions with Italian and UK experts; ^gIncludes aseptic manufacturing and chemotherapy release versus amivantamab release. HCP, health care professional; IV, intravenous; NSCLC, non-small cell lung cancer; Q4W, every 4 weeks; SACT, systemic anticancer treatment; SC, subcutaneous; UK, United Kingdom.

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Results

- In the Italian analysis, SC amivantamab Q4W + lazertinib required 47% less HCRU time versus osimertinib + chemotherapy (15.5 vs 29.0 hours, respectively; **Figure 2A**); in the UK analysis, 59% less HCRU time was required (6.4 vs 15.5 hours, respectively; **Figure 2B**)
- For SC amivantamab Q4W + lazertinib versus osimertinib + chemotherapy:
 - Premedication time was 100% lower in the Italian analysis (0 vs 2.9 hours) and 62% lower in the UK analysis (0.5 vs 1.3 hours)
 - Time associated with drug preparation and administration was 48% lower in the Italian analysis (13.5 vs 26.1 hours) and 73% lower in the UK analysis (3.9 vs 14.2 hours)
 - Year 1 patient chair time related to treatment administration was estimated to be 2.3 versus 7.3 hours
- HCRU time reductions resulted in a 52% lower annual cost per patient for SC amivantamab Q4W + lazertinib than osimertinib + chemotherapy in the Italian analysis (€1070 vs €2209; **Figure 3A**) and a 57% lower annual cost per patient in the UK analysis (£448 vs £1033; **Figure 3B**)
- After evaluating various inputs in sensitivity analyses for cost savings associated with the average patient in the UK, results were consistently in favor of SC amivantamab Q4W + lazertinib versus osimertinib + chemotherapy (**Table 3**)

Table 3: Sensitivity analyses for costs associated with SC amivantamab Q4W + lazertinib in the average patient in the UK

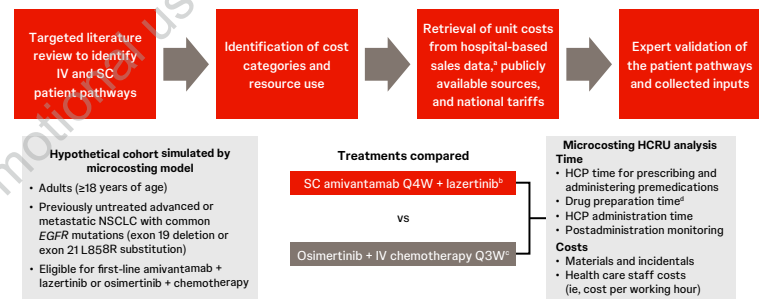
Sensitivity analysis	Savings with SC amivantamab Q4W + lazertinib
Base case	
Drug preparation for SC amivantamab (pharmacist: 2 min; pharmacy technician: 4 min)	£576
Drug administration (nurse time: 30% of time for osimertinib + chemotherapy)	£476
Drug administration (nurse time: 70% of time for osimertinib + chemotherapy)	£696
Postadministration monitoring for SC amivantamab (1 h: 50% nurse time)	£661
Nurse Grade 5 (cost of working hour: £53)	£583

Q4W, every 4 weeks; SC, subcutaneous; UK, United Kingdom.

Potential limitations

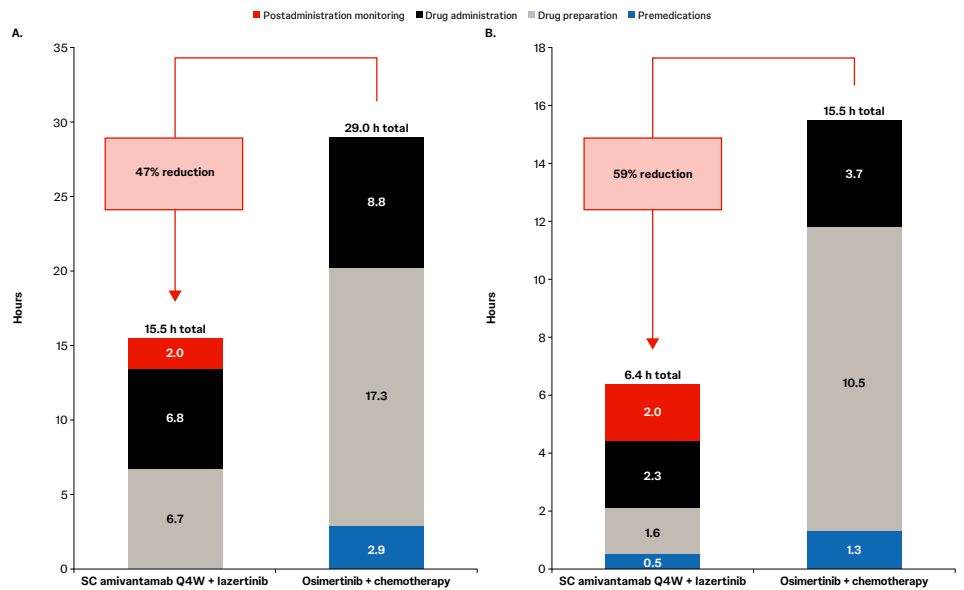
- This analysis represents a snapshot in time and does not take into account financial fluctuations in cost
- Assumptions made in the model may not fully reflect real-world practice and may not capture some costs and time spent for patients with *EGFR*-mutated NSCLC
- The Italian and UK analyses used different source inputs beyond the Summary of Product Characteristics and publications: the Italian analysis leveraged hospital consumption and sales data, and the UK analysis was model based
 - Further analyses will be required in different health care systems for an accurate view of local outcomes

Figure 1: Cost model design



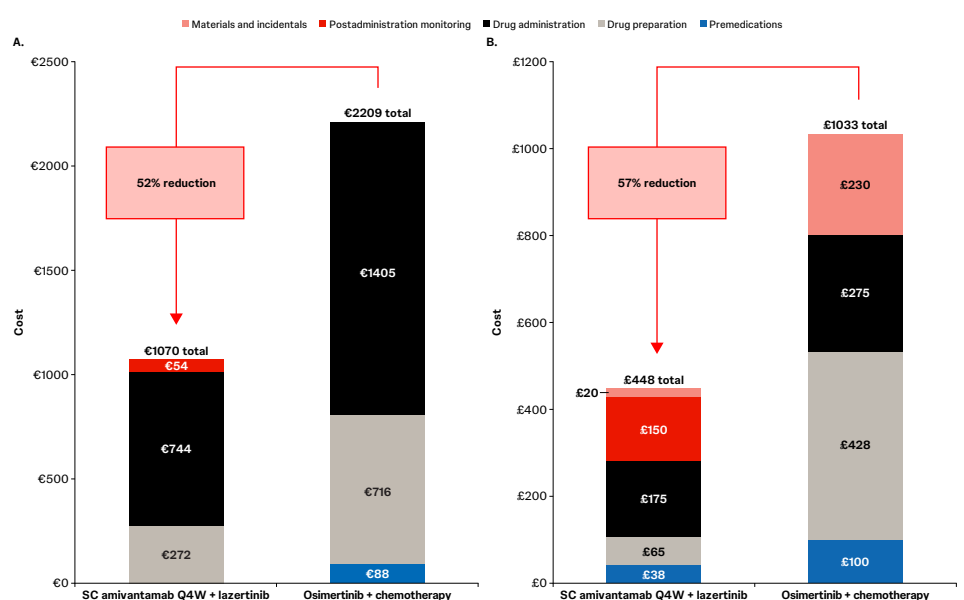
Note: Italy inputs were also extracted from health care databases. ^aHospital-based sales data were only used in the Italian analysis, alongside the Summary of Product Characteristics and references. ^bModel assumptions: patients received SC amivantamab (concentration, 160 mg/mL), co-formulated with recombinant human hyaluronidase (PH20), administered by manual injection at a dose of 1800 mg (2240 mg for body weight ≥80 kg) once weekly for the first 4 weeks and then at 3520 mg (4640 mg for body weight ≥80 kg) Q4W thereafter. Lazertinib was administered orally at a dose of 240 mg QD. ^cModel assumptions: patients received oral osimertinib (80 mg QD) and IV pemetrexed (500 mg/m²) either cisplatin (75 mg/m²) or carboplatin (area under the concentration–time curve 5) administered IV on Day 1 of 21-day cycles for 4 cycles. This treatment was followed by oral osimertinib (80 mg QD) + IV pemetrexed maintenance therapy (500 mg/m²) Q3W. In the UK, pharmacist release time was used for SC amivantamab, and aseptic manufacturing and release time were used for chemotherapy. ^dEGFR, epidermal growth factor receptor; HCP, health care professional; HCRU, health care resource use; IV, intravenous; NSCLC, non-small cell lung cancer; Q3W, every 3 weeks; Q4W, every 4 weeks; QD, once daily; SC, subcutaneous; UK, United Kingdom.

Figure 2: Year 1 HCRU time by assumption in (A) Italy and (B) the UK



HCRU, health care resource use; Q4W, every 4 weeks; SC, subcutaneous; UK, United Kingdom.

Figure 3: Year 1 costs by assumption in (A) Italy and (B) the UK



Q4W, every 4 weeks; SC, subcutaneous; UK, United Kingdom.

