

Cost Analysis of Lurasidone for the Treatment of Schizophrenia in Adults and Adolescents

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BACKGROUND AND OBJECTIVES

Schizophrenia is a serious mental health condition characterized by distortions in thought processes, perception, mood, sense of self and behavior [1]. While there is no cure for schizophrenia, evidence shows that it can be treated effectively using pharmacological and psychosocial therapies [2]. Most pharmacological interventions target dopamine pathways in the brain and can broadly be classified into typical and atypical antipsychotics. Lurasidone is a second-generation atypical antipsychotic with a license for the treatment of schizophrenia in both adults and adolescents and represents an additional treatment option alongside already existing antipsychotics [3]. There are currently no restrictions on treatment lines of schizophrenia therapy within the UK, with the National Institute for Health and Care Excellence (NICE) advising that “the choice of antipsychotic medication should be made by the service user and healthcare professional together” [4].

The objective of this study was to demonstrate the cost impact of lurasidone as a first-line option, when compared to alternative antipsychotics, for the treatment of schizophrenia in both adolescents (13-17 years and 15-17 years) and adults (18 years and above).

TREATMENT SEQUENCES

The primary outcome was an estimated incremental cost comparing lurasidone as a first-line treatment option when compared to second- and third-line populations respectively. The treatment sequences were chosen to reflect current (and expected) clinical practice.

Adolescents (aged 13-17 years) (under 15’s limited to lurasidone or haloperidol due to licensing):

Intervention: Lurasidone, haloperidol, aripiprazole, paliperidone and clozapine

Comparator: Haloperidol, lurasidone, aripiprazole, paliperidone and clozapine

Adolescents (aged 15-17 years):

Intervention: Lurasidone, haloperidol, aripiprazole, paliperidone and clozapine

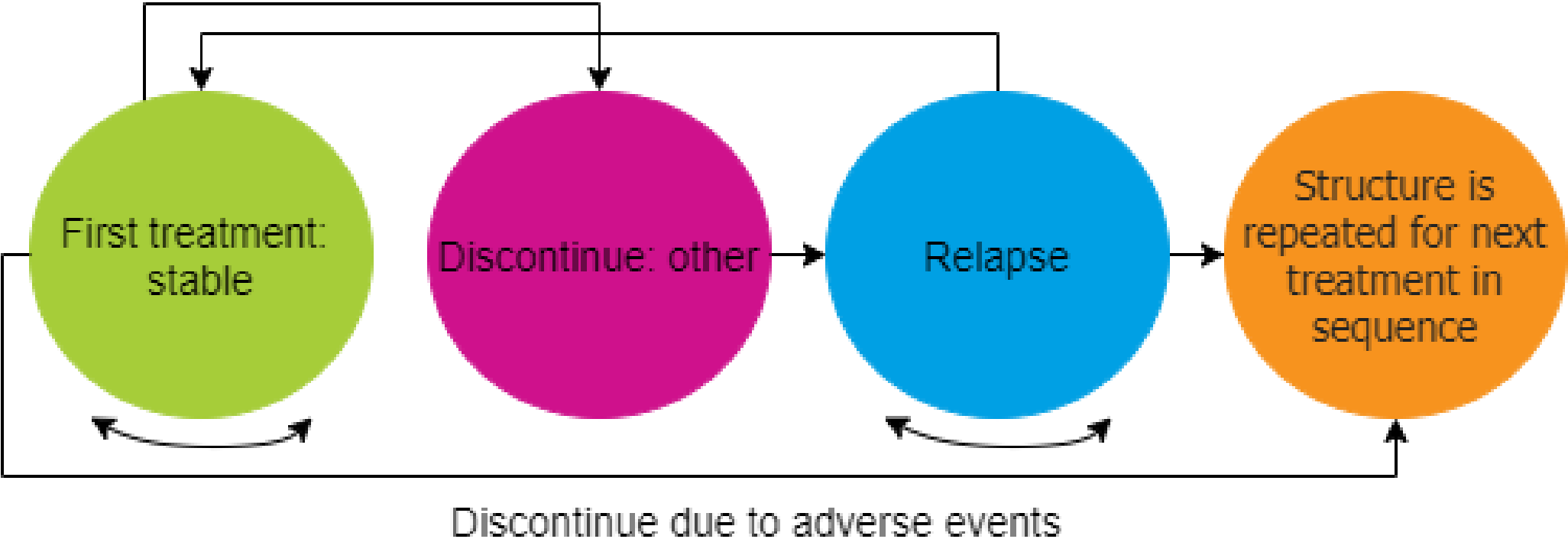
Comparator: Haloperidol, lurasidone, aripiprazole, paliperidone and clozapine

Adults:

Intervention: Lurasidone, cariprazine, brexpiprazole and clozapine

Comparator: Cariprazine, brexpiprazole, lurasidone and clozapine

Figure 1: Model schematic (for all populations)



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METHODS

A Markov model was developed in Microsoft Excel to estimate the cost impact of lurasidone as a first-line treatment option. The sequence-based model incorporated health states classified by stable (no relapse or discontinuation), discontinuation (due to adverse events or other reasons) and relapse. The current model was designed in alignment with two published NICE models [12, 20]. The movement of patients between health states was informed by network meta-analyses. Patients discontinuing first-line treatment, due to intolerable side effects or other reasons, were assumed to either switch to second-line therapy or stop treatment abruptly and move onto no treatment (where they remained until they experienced a relapse). Patients were assumed to stop any antipsychotic drug following relapse and, instead, were treated for the relapse episode. Following relapse, patients either returned to their previous antipsychotic medication or switched to the next treatment in the sequence. It was assumed that the discontinuation of an antipsychotic because of intolerable side effects only occurred during the first six weeks of use. However, discontinuation due to other reasons was possible across the remainder of cycles. A cost was assigned to patients that experienced side effects that did not lead to discontinuation. It was also possible for patients to die within any health state. All assumptions were clinically validated. Discount rates were 3.5% for costs. Deterministic sensitivity analysis (DSA) was conducted to assess the impact of bias on the results of the model.

Table 1: Key model input parameters

Intervention	Six-weekly probability				
	Discontinuation: intolerable adverse events	Discontinuation: other reasons	Relapse	>7% weight gain	Extrapyramidal symptoms
Lurasidone (adolescents) (80mg)	1.3% [5]	8.8% [5]	2.1% [9]	5.9% [8]	28.7% [8]
Haloperidol (3mg)	8.0% [6]	7.5% [8]	4.9% [10]	9.7% [8]	46.2% [8]
Paliperidone (3mg)	3.4% [5]	3.8% [5]	1.9% [9]	16.9% [8]	23.8% [8]
Aripiprazole (10mg)	15.3% [5]	25.7% [5]	4.6% [9]	9.0% [8]	19.5% [8]
Lurasidone (adults) (148mg)	7.6% [7]	18.2% [7]	2.1% [9]	5.9% [8]	28.7% [8]
Brexpiprazole (4mg)	5.6% [7]	25.6% [7]	2.5% [9]	13.5% [8]	23.7% [8]
Cariprazine (6mg)	8.5% [7]	28.8% [7]	3.7% [9]	5.6% [8]	32.7% [8]
Clozapine (325mg)	N/A	5.4% [8]	2.9% [11]	33.3% [8]	6.8% [8]

Six-weekly health state costs (per patient)	Stable	Relapse	Source
Adults	£2,000	£27,906	[12-18]
Adolescents	£701	£28,692	[12-19]
Six-weekly adverse events costs (per patient)	Costs		Source
>7% weight gain	£91.60		[13,19]
Acute extrapyramidal symptoms	£219.51		[12,17]

RESULTS

Table 2: Results

Total cost (five-year, per 100 patients)	First-line	Second or third-line	Difference
Adolescent (13-17 years)	£10,006,053	£10,314,941	-£308,889
Adolescent (15-17 years)*	£5,223,476	£5,417,407	-£193,931
Adults (18 years and over)	£14,026,233	£14,105,885	-£79,653

*Results presented for a three-year time horizon. Incremental cost per patient: £3,089, £1,939 and £797 for 13-15, 15-17 and 18+ populations, respectively. The results suggest that lurasidone as a first-line treatment is cost-saving within the adolescent and adult populations when compared to second-line and third-line respectively. Lurasidone is more expensive in terms of treatment costs, resource use (in the stable health state) and the treatment of adverse events. However, these costs are outweighed by the savings associated with the relapse health state. DSA showed that the results were most sensitive to the rate of discontinuation (due to other reasons) in all populations. However, this input only caused lurasidone to become cost-incurring as a first-line treatment within the 13-17 year population when varied.

CONCLUSIONS

Lurasidone is cost-saving as a first-line treatment within all populations because patients receiving this treatment option spend less time within the relapse health state (which is the most-costly health state).

REFERENCES

1 World Health Organization (WHO). Mental disorders: Schizophrenia. 2019. Available from: https://www.who.int/mental_health/management/schizophrenia/en/. 2. Essali N, *et al.* Cariprazine versus placebo for schizophrenia. Cochrane Database Syst Rev. 2016;5:CD012207. 3. Agency EM. Latuda. Amsterdam: 2020. [cited 13 October 2020]. Available from: <https://www.ema.europa.eu/en/medicines/human/EPAR/latuda>. 4. Excellence NfHaC. Choosing and delivering interventions for psychosis and schizophrenia in adults. [cited 20.07 2021]. Available from: <https://pathways.nice.org.uk/pathways/psychosis-and-schizophrenia/choosing-and-delivering-interventions-for-psychosis-and-schizophrenia-in-adults#content=view-node%3Anodes-choosing-antipsychotic-medication>. 5. Unpublished NMA completed by YHEC (2021), PROSPERO number: CRD42021244609. 6. Srisurapanont M, *et al.* A network meta-analysis of the dose–response effects of lurasidone on acute schizophrenia. Scientific reports. 2021 Mar 10;11(1):1-3. 7. Unpublished NMA completed by YHEC (2021), PROSPERO number: CRD42020167883. 8. Huhn M, *et al.* Comparative efficacy and tolerability of 32 oral antipsychotics for the acute treatment of adults with multi-episode schizophrenia: a systematic review and network meta-analysis. The Lancet. 2019 Sep 14;394(10202):939-51. 9. Kearns B, *et al.* Schizophrenia Treatment with Second-Generation Antipsychotics: A Multi-Country Comparison of the Costs of Cardiovascular and Metabolic Adverse Events and Weight Gain. Neuropsychiatric Disease and Treatment. 2021;17:125. 10. Adams CE, *et al.* Haloperidol versus placebo for schizophrenia. Cochrane Database of Systematic Reviews. 2013(11). 11. Kishimoto T, *et al.* Relapse prevention in schizophrenia: a systematic review and meta-analysis of second-generation antipsychotics versus first-generation antipsychotics. Molecular Psychiatry. 2013 Jan;18(1):53-66. 12. Psychosis and Schizophrenia in Adults. The NICE Guideline on Treatment and Management. Updated edition 2014. 13. Curtis L, Burns A. Unit Costs of Health and Social Care 2020. Canterbury: 2020. Available from: <https://www.pssru.ac.uk/project-pages/unit-costs/unit-costs-2020/>. 14. Statistics HE. Hospital Episode Statistics for Admitted Patient Care and Outpatient Data. 2021. Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/hospital-episode-statistics-for-admitted-patient-care-outpatient-and-accident-and-emergency-data>. 15. Curtis L, Burns A. Unit Costs of Health and Social Care (2007) 16. Excellence NfHaC. Olanzapine. Available from: <https://bnf.nice.org.uk/drug/olanzapine.html#indicationsAndDoses>. 17. Drugs and pharmaceutical electronic market information tool (eMIT) 18. National Institute for Health and Care Excellence. Psychosis and schizophrenia in children and young people: recognition and management (CG155). London: 2013. Available from: <https://www.nice.org.uk/guidance/cg155>. 19. National Institute for Health and Care Excellence. Aripiprazole for the treatment of schizophrenia in people aged 15 to 17 years (TA213). 2011. Available from: <https://www.nice.org.uk/guidance/ta213>.

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