

A Multinational Study to Explore Patient Preferences for Chronic Myeloid Leukaemia (CML) Treatment: Results from Europe

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INTRODUCTION While tyrosine kinase inhibitors (TKIs) allow most patients with chronic-phase chronic myeloid leukaemia (CP-CML) to achieve near-normal life expectancy, they are associated with a range of potential side effects. Maintaining tolerability is important to sustain treatment adherence and thereby achieve optimal outcomes. Therefore, **understanding patient preferences and trade-offs is critical to ensure that treatment decisions reflect what matters most to patients.**

METHODS We conducted an online discrete choice experiment (DCE) to understand patient preferences for TKI treatment. Patient respondents were recruited via the CML Advocates Network from North America (USA, Canada), Europe (France, Germany, Italy, Spain, the UK), and Asia (China, Japan). For this analysis, we are focusing on European data. The DCE asked respondents to make 12 choices between hypothetical treatments described by the attributes and their levels (Figure 1).

Using a multinomial logit (NML) model, we estimated overall **part-worth utilities** (PWUs) for attribute levels and **attribute relative importance** (ARI) by the respondents' line of therapy (LoT). ARI represents each attribute's relative contribution to the overall change in utility between the best-case (all attributes at their most-preferred level) and worst-case (all attributes at their least-preferred level) scenario. *Note that ARI is dependent on the range of the levels for each attribute.* We also estimated the equivalence in value between different attributes, described in terms of the **willingness to forego some chance of Deep Molecular Response (DMR) in return for an improvement in another attribute.**

DCE ATTRIBUTES & LEVELS The DCE was developed in consultation with patients from all study countries. We conducted semi-structured 1-hour qualitative interviews to explore experiences of people living with CP-CML, including how treatment effectiveness might be defined, attitudes towards treatment-free remission (TFR) and the important characteristics of TKIs. The attributes were selected based on the interviews, and the levels were assigned to represent plausible ranges based on clinical evidence (Table 1).

Interview participants highlighted the importance of treatment efficacy, though views were mixed on the desirability of achieving TFR. They voiced concerns about the tolerability of TKIs, such as the experience of fatigue, gastrointestinal issues, and myalgia. Longer-term side effects that may persist even upon cessation of treatment were also a major concern that may influence treatment choices. Beyond TKI-specific concerns, challenges were also described in relation to dismissive communication from clinicians, and a lack of patient-led decision-making and psychological support.

TABLE 1: DCE attributes and levels

Attribute	Levels			
How treatment is taken	Once per day, no fasting	Twice per day, no fasting	Once per day, 3-hour fast	Twice per day, 3-hour fast
Chance of Deep Molecular Response (DMR) within 2yrs	15 out of 100 patients	35 out of 100 patients	50 out of 100 patients	
Experience of fatigue	No or mild fatigue most days	Moderate fatigue most days	Strong fatigue most days	
Risk of gastrointestinal (GI) problems	15 out of 100 patients	45 out of 100 patients	75 out of 100 patients	
Risk of breathing problems	5 out of 100 patients	25 out of 100 patients	40 out of 100 patients	
Risk of long-term cardiovascular (CV) problems	5 out of 100 patients	15 out of 100 patients	25 out of 100 patients	

FIGURE 1: Example choice task

Treatment A	Treatment B
How the treatment is taken Pill taken once daily (with or without food)	How the treatment is taken Pill taken twice daily on an empty stomach (no food 2 hours before and 1 hour after)
Chance of Deep Molecular Response (cancer cells reducing to a very low level) within 2 years 35 out of every 100 patients (35%)	Chance of Deep Molecular Response (cancer cells reducing to a very low level) within 2 years 15 out of every 100 patients (15%)
Experience of fatigue Strong fatigue most days	Experience of fatigue No or mild fatigue most days
Risk of gastrointestinal problems 75 out of every 100 patients (75%)	Risk of gastrointestinal problems 15 out of every 100 patients (15%)
Risk of breathing problems 40 out of every 100 patients (40%)	Risk of breathing problems 25 out of every 100 patients (25%)
Risk of long-term cardiovascular problems 25 out of every 100 patients (25%)	Risk of long-term cardiovascular problems 5 out of every 100 patients (5%)
<input type="checkbox"/> Select Treatment A	<input type="checkbox"/> Select Treatment B

RESULTS The analytic sample consisted of 344 respondents (Table 2).

- PWUs indicate that respondents preferred lower levels of fatigue, a higher chance of DMR, lower risk of adverse events (AEs), and more convenience in how treatment is taken, especially avoiding fasting.
- Day-to-day experience of fatigue was the most important attribute in respondent choices, followed by chance of DMR within two years, risk of GI problems, how treatment is taken, breathing problems, and risk of long-term cardiovascular problems.
- There were no significant differences by line-of-therapy (LoT) and overlapping CIs suggest most attributes had similar weight within both LoT groups.

TABLE 2: Respondent characteristics

	France (N=84)	Germany (N=70)	Italy (N=45)	Spain (N=39)	UK (N=106)	Combined (N=344)
Data collection dates						
Opened	28/05/25	24/06/25	26/06/25	02/05/25	30/04/25	
Data cut	25/08/25	25/08/25	25/08/25	25/08/25	25/08/25	
Line of treatment						
First	38 (45.2%)	23 (32.9%)	21 (46.7%)	14 (35.9%)	46 (43.4%)	142 (41.3%)
Second	18 (21.4%)	15 (21.4%)	12 (26.7%)	7 (17.9%)	23 (21.7%)	75 (21.8%)
Third	11 (13.1%)	8 (11.4%)	5 (11.1%)	4 (10.3%)	15 (14.2%)	43 (12.5%)
Fourth+	9 (10.7%)	8 (11.4%)	2 (4.4%)	2 (5.1%)	11 (10.4%)	32 (9.3%)
TFR	8 (9.5%)	16 (22.9%)	5 (11.1%)	12 (30.8%)	11 (10.4%)	52 (15.1%)

In **Figure 2**, the vertical bars show the relative importance of each attribute in respondent choices, by (LoT), excluding respondents in TFR (N=52).

FIGURE 2: Relative attribute importance (N=292, excluding TFR)

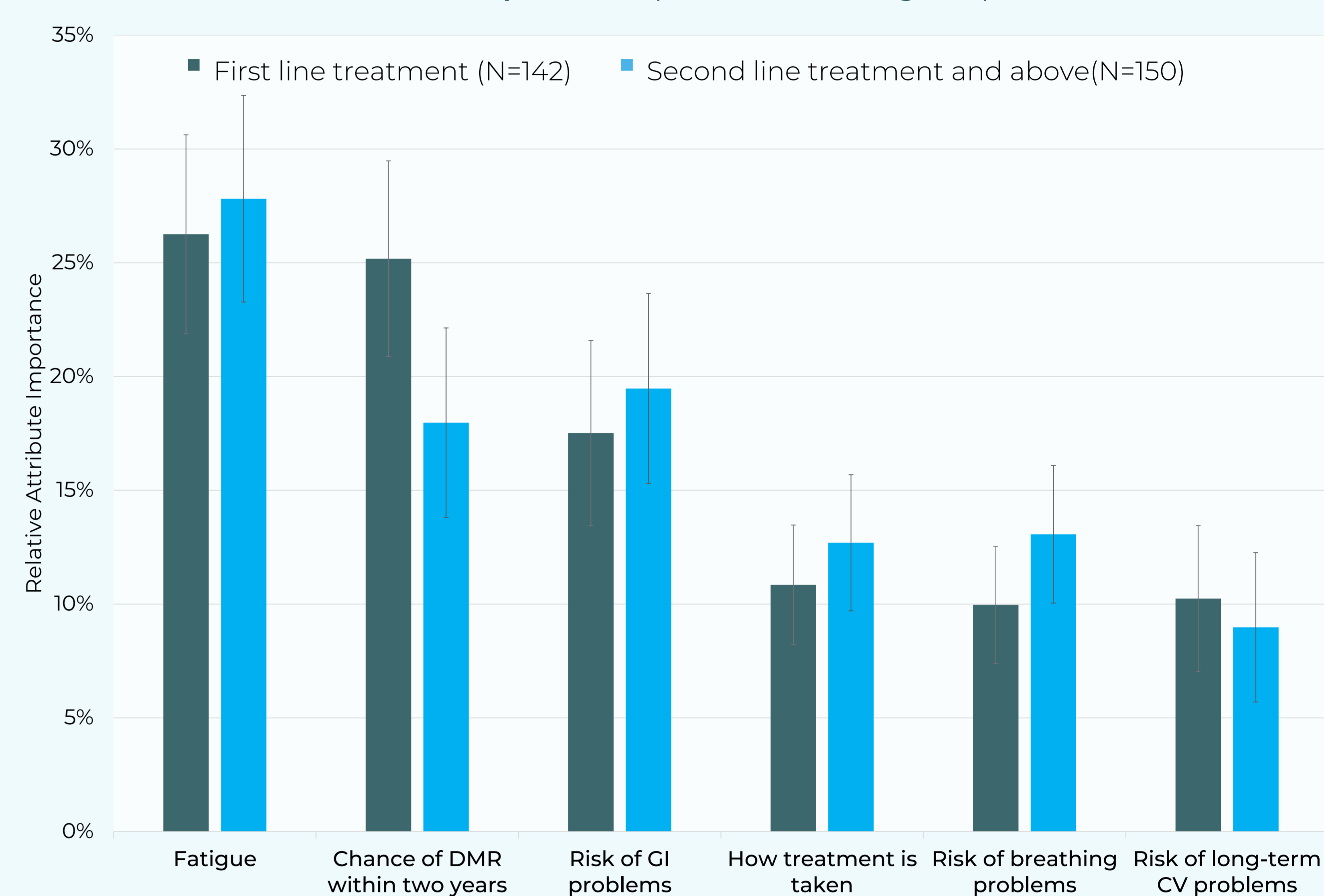


Table 3 shows the improvement in DMR respondents would, in theory, be willing to forego in order to improve the levels of the other attributes. This is an alternative way of expressing the relative importance of the attributes.

TABLE 3: Attribute value equivalence ("risk-benefit trade-offs")

Outcome	Equivalent to this improvement in chance of DMR
Having no or mild fatigue* (compared to strong fatigue)	43% increase
Reduced GI risk (from 75% to 15%)	30% increase
Easier treatment, from 2x/day with fasting to 1x/day without fasting	20% increase
Reduced risk of breathing problems (from 40% to 5%)	19% increase
Reduced long-term cardiovascular risk (from 25% to 5%)	18% increase

*As fatigue can arise as both a symptom of CML and a treatment-related side effect, this trade-off should be interpreted carefully.

DISCUSSION The relative importance of fatigue in patient choices highlights **fatigue as an important unmet need in CML**. Convenience in how treatment is taken is also important to patients; at least equal in importance to the risk of breathing problems and long-term CV problems. These results also confirm ongoing unmet needs around a better chance of treatment success and lower risks for all adverse events.

With respect to previous DCEs in CML, Mason *et al.*¹ tested a different set of attributes and found that patients prioritised the risk of a blockage of a major blood vessel over all other attributes, including risk of fatigue. They also found a strong aversion to fasting requirements, and that this attribute was more important than AEs like nausea and diarrhoea. Hirji *et al.*² explored preferences and willingness-to-pay (WTP) for different options of dosing frequency and fasting. WTP was greatest for dosing options that did not require fasting. We found a similar aversion to fasting, but this attribute was less important than the other aspects of treatment we tested, and that the importance of long-term CV problems was similar to the other AEs we tested. However, relative attribute importance is design dependent. Differences in attributes and levels, samples, treatment options and analysis choice can impact results – therefore results are not expected to be identical across studies.

These results demonstrate **the importance of understanding and accounting for the day-to-day experience of patients** alongside clinical endpoints like chance of DMR and adverse events when assessing the value of treatments for CML.

¹ Mason *et al.* Quantifying Patient Preferences for Tyrosine Kinase Inhibitors in Chronic Myeloid Leukemia: A Discrete-Choice Experiment. European Hematology Association 2021.

² Hirji *et al.* Patient Preferences for Chronic Myeloid Leukemia Medication Regimen Attributes and their Potential Impact on Adherence: Results from a Multi-national Conjoint Study. JHEOR. 2014 Sep 3;2(1):75-86.

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