Real-World Cost-Effectiveness Analysis of Sequential Therapy of iCT IRd and DRd modality for Newly Diagnosed Multiple Myeloma Patients Who Are Transplant-Ineligible in China

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BACKGROUND

- Multiple myeloma (MM) is an incurable hematological malignancy with a nearly 30% increase in incidence over a 10-year interval in China.[1]
- The in-class transition (iCT) IRd modality (in-class transition from bortezomib-based induction regimens to ixazomib-lenalidomide-dexamethasone regimen) and the DRd modality (daratumumab-lenalidomide-dexamethasone regimen as induction therapy and continuous therapy) are recommended for newly diagnosed multiple myeloma patients who are ineligible for stem-cell transplantation (NDMM). [2]
- Previous real-world studies have shown that iCT IRd modality offers better adherence, greater effectiveness, and superior safety than DRd modality.

OBJECTIVE

- This study aims to assess the cost-utility of the iCT IRd modality compared to the DRd modality for NDMM from the perspective of the Chinese healthcare system.

Method 1: Model Design

Model Features	
Model design	Markov model
Model perspectives	Chinese healthcare system
Target Patients	Patients with transplant ineligible newly diagnosed multiple myeloma
Model comparators	iCT IRd modality vs. DRd modality
Time horizon	Lifetime
Model cycle length	1- month
Annual discount rate	5% for both health benefits and medical costs
Model Inputs	• Cohort age and % male • Treatment compliance • Treatment efficacy • Drug and healthcare resource utilization • Utilities
Model outcomes of interest	• Life years • Quality-Adjusted Life Years (QALYs) • Total direct medical costs • Incremental cost-utility ratio (ICUR)

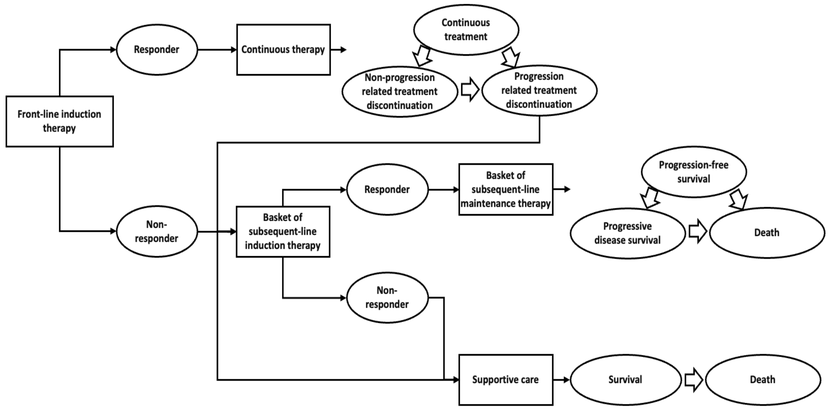


Figure 1: Diagram of Markov Model Structure

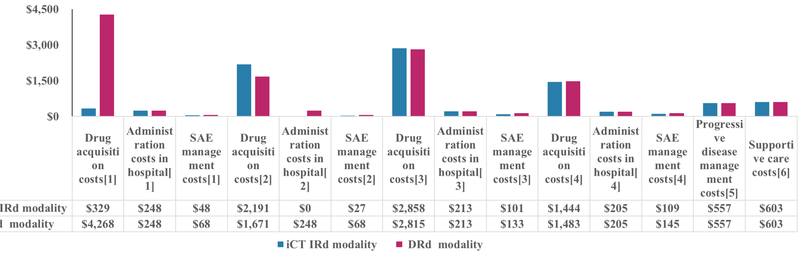
Method 2: Model Inputs

- Data used in this model were from the published literature and public data sources.
- The starting age and male proportion were **60.5** years and **57.2%**, respectively, which were based on the SLR for the characteristics of Chinese patients with NDMM.

2.1 Key Compliance, Efficacy and Utility Inputs

Model inputs	iCT IRd modality			DRd modality		
	Baseline	95% CI lower limit	95% CI upper limit	Baseline	95% CI lower limit	95% CI upper limit
Treatment compliance of continuous therapy						
Monthly discontinuation risk	0.043	0.026	0.071	0.055	0.037	0.081
Proportion of patients with discontinued treatment due to progressive disease	26.0%	18.8%	34.8%	50.1%	-	-
Treatment efficacy						
Overall response rate (ORR)						
Induction therapy for NDMM	82.6%	-	-	87.3%	80.3%	92.1%
Subsequent induction therapy for rrMM	67.4%	-	-	61.2%	-	-
Monthly risk of progressive disease						
Patients with discontinued treatment for NDMM (not related disease relapse)	0.035	-	-	0.018	0.004	0.057
Subsequent continuous therapy for rrMM	0.037	-	-	0.064	-	-
Monthly risk of mortality						
rrMM with progressive disease	0.012	-	-	0.022	-	-
Supportive care	0.064	-	-	Same as the iCT IRd modality		
Quality of life (utility)						
PFS under continuous therapy for NDMM	0.817	-	-	Same as the iCT IRd modality		
Progression-free survival (PFS) under subsequent continuous therapy for rrMM	0.754	-	-	Same as the iCT IRd modality		
Post-progression survival (PPS)	0.643	-	-	Same as the iCT IRd modality		
Disutility associated with serious AE	0.049	-	-	Same as the iCT IRd modality		

Figure 2. Medical costs per treatment cycle*



*All included medical costs were adjusted to 2024 Chinese currency values according to the historic inflation rate of China, which are reported in 2025 US dollars using the exchange rate as of February 11 (¥7.12 for $1). **Different states (see figure 1)**: [1] Induction therapy for NDMM; [2] Continuous therapy for NDMM; [3] Subsequent induction therapy for rrMM; [4] Subsequent continuous therapy for relapsed-refractory multiple myeloma (rrMM).

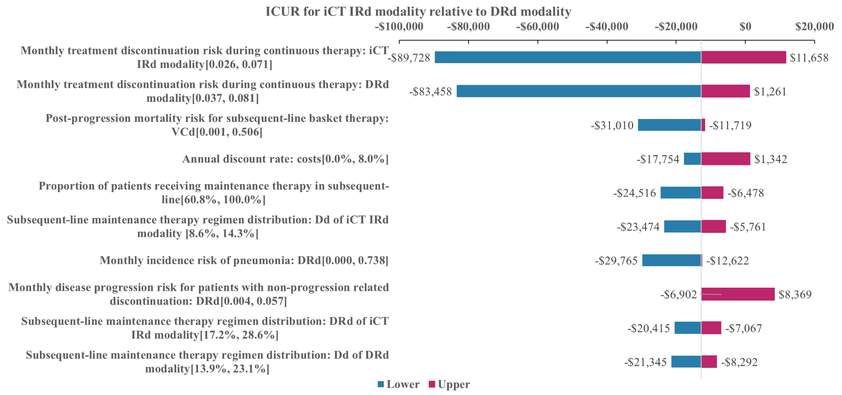
Result 1: Base-Case Analysis*

Treatment modality	iCT IRd modality	DRd modality	Difference
Life years	**5.774**	**5.076**	**0.698**
Front line (years)	3.072	3.271	-0.199
Subsequent lines (years)	2.702	1.805	0.897
QALYs	**4.620**	**4.066**	**0.554**
Front line	2.646	2.733	-0.087
Subsequent lines	1.975	1.334	0.641
Lifetime medical costs	**$86,076**	**$93,137**	**-$7,061**
Front line	$45,770	$63,964	-$18,194
Subsequent lines	$40,306	$29,173	$11,133
ICUR for iCT IRd modality vs. DRd modality	**Cost-effectiveness dominance**		

*The base case demonstrated a clear cost-effectiveness dominance of the iCT IRd modality over the DRd modality when daratumumab is subcutaneous.

- **Scenario analysis**: After the replacement of intravenous daratumumab with subcutaneous daratumumab in the model, the iCT IRd modality still yielded more health benefits than the DRd modality and resulted in overall cost savings. Thus, the cost-effectiveness dominance of the iCT IRd modality remained superior to that of the DRd modality.

Result 2: One-Way Sensitivity Analysis



Dd: Daratumumab-dexamethasone; **DRd**: Daratumumab-lenalidomide-dexamethasone; **IRd**: Ixazomib-lenalidomide-dexamethasone; **VCd**: Bortezomib-Cyclophosphamide-dexamethasone.

One-way sensitivity analysis suggested that results were primarily influenced by the discontinuation risks of continuous therapy for both modality. However, the ICUR remained under 1 time of China's gross domestic product per capita (GDPPC, $12,550) considering the uncertainty of all tested model inputs.

Result 3: Probabilistic Sensitivity Analysis (PSA)

Figure 3: The scatter points of the generated ICUR of the iCT IRd modality relative to the DRd modality from the performed PSA

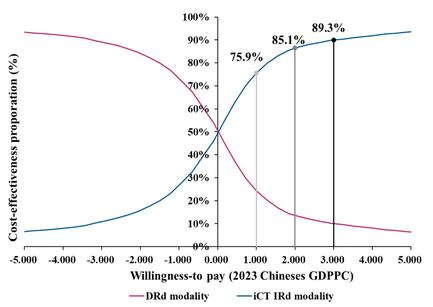


Figure 4: The cost-effectiveness acceptability curves for the iCT IRd modality versus DRd modality for NDMM under varied willingness-to-pay thresholds

Probabilistic sensitivity analysis estimated that the iCT IRd modality achieved probabilities of 75.9%, 85.1%, and 89.3%, of being cost-effective under willingness-to-pay thresholds of 1-, 2-, and 3-times GDPPC per QALY in 2023, respectively.

CONCLUSIONS

- The iCT IRd modality dominated the DRd modality for NDMM in China by providing more health benefits and saving costs, regardless of the administration route of daratumumab.
- The uncertainty of the CUA has limited impact on the cost-effectiveness dominance, supporting the use of iCT IRd modality as a favorable treatment option.

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