

- Title** Immunotherapy for Metastatic Melanoma and Economic Evaluation
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[http://www.moh.gov.my/index.php/database\\_stores/store\\_view\\_page/30/323](http://www.moh.gov.my/index.php/database_stores/store_view_page/30/323)

**Aim**

To study the evidence on safety, effectiveness and cost-effectiveness of Pembrolizumab, Nivolumab as compared to Dacarbazine for treatment of metastatic melanoma patients.

**Conclusions and results**

In term of safety, the most frequent adverse events were fatigue, diarrhoea, and vomiting in the anti-PD-1 group. In term of effectiveness, the result indicated that immunotherapy significantly prolonged the median PFS for advanced melanoma patients.

There was various cost-effectiveness studies conducted in different countries. Each of the studies was having variability in the immunotherapy and comparators used in the published cost-effectiveness analyses. Although some studies reported the treatment as cost-effective, it was based on the country's willingness-to-pay (WTP) threshold to decide the cost-effectiveness of various treatment regimes. Hence, it was not possible to conclude which immunotherapy was the most cost-effective treatment. However, there was one systematic review that suggested that the immunotherapy may not be cost-effective compared to chemotherapy.

The result from economic evaluation (base case analysis) showed that immunotherapy resulted with higher costs and QALYs gained compared with Dacarbazine. None of the treatments shown to be cost-effective at the suggested acceptable cost-effectiveness threshold of  $\leq 1$  GDP per capita per QALY gained. Sensitivity analyses were conducted as one way and scenario analysis by varying the parameters used in the model. The estimated ICERs ranged between MYR 53,000 to MYR 6,500,000. Price of the medicines and clinical parameters are possibly an important parameter that drives the direction of the treatment's cost-effectiveness.

**Recommendations (if any)**

Nivolumab and Pembrolizumab are not cost-effective for treatment of metastatic melanoma unless there is a revision in the drug price making it cost-effective.

**Methods****Systematic Review**

Electronic databases were searched through the Ovid interface: Ovid MEDLINE® In-process and other Non-

indexed citations and Ovid MEDLINE® 1948 to present, EBM Reviews - Cochrane Central Register of Controlled Trials – August 2018, EBM Reviews - Cochrane Database of Systematic Reviews - 2005 to August 6, 2018, EBM Reviews - Health Technology Assessment – 2nd Quarter 2018, Embase – 1996 to 2018 August 06. Searches were also run in PubMed.

Google was used to search for additional web-based materials and information. No limits were applied. Additional articles were identified from reviewing the references of retrieved articles. Last search was conducted on 6 August 2018.

**Local economic evaluation**

A state transition cohort model was build using Microsoft Excel® 2010 to estimate the cost effectiveness of Pembrolizumab/Nivolumab compared with Dacarbazine. Three health states were employed in this model; progression free, disease progression and dead. The model was constructed using monthly cycle and 5 years time horizons from the perspective of Ministry of Health Malaysia. The models used an estimated clinical effectiveness and probabilities of adverse events based on the published literatures. An annual discount rate of 3% was applied to both cost and effectiveness as recommended in the manual of economic evaluation for health technologies and pharmacoeconomic guidelines. All costs were adjusted to year 2017 value and expressed in Malaysian Ringgit (MYR).

**Further research/reviews required**

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