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Cancer Genomics Report Summary

Simplified Chinese (癌症基因报告摘要)

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Cancer Genomics Report Summary (癌症基因报告摘要)

Since 2017, treatment of advanced deadly cancers – particularly lung cancer and metastatic melanoma – has undergone a major paradigm shift. Traditional pillars of cancer treatment – surgery, radiation, and chemotherapy – have moved to 2 new efficacious approaches: tumor genomics and immunotherapy.

自 2017 年起，晚期致命癌症（包括肺癌和扩散的肿瘤）的治疗发生了重大的变化。治疗方案已由传统的手法如手术、电疗和化疗变成用肿瘤基因治疗和免疫治疗这两种更有效的疗法。

The impact on the insurance industry is becoming increasingly profound. High morbidity and mortality are reduced significantly for roughly 30% of patients in these cancers, and increasingly other cancers, where 5- year survival rates have been below 50%.

这对于保险业有着越来越显著的影响。对于五年存活率低于百分之五十的癌症，这种疗法能帮大约百分之三十的病人降低发病率和死亡率，而对于其他癌症也日渐有效。

Oncologists' new weapon is a class of antibody drugs led by Keytruda® (Merck) that free up the previously blocked immune system to recognize and destroy tumors. Collectively, these drugs are called ImmunoOncology therapies, or I-O, sometimes called 'checkpoint inhibitors.' However, the release of the immune system can be overdone and cause side effects or worse. At least one tumor genetic test, TMB (tumor mutational burden), promises to pre-qualify patients for I-O, to lower this danger. TMB simply counts the number of mutations in biopsied tumor cells, without regard to the gene(s) or other fine detail. Counts over 15 generally qualify a patient for I-O treatment. For those with low numbers a second targeted genomic test, PD-L1, can still rescue and requalify treatment.

肿瘤科医生的新武器便是一种由 Keytruda® (Merck) 主导的抗体，这种抗体能释放之前被隔绝的免疫系统，从而识别并破坏的癌细胞。总括而言，这类型的药物叫做免疫肿瘤治疗 （I-O）或称为抑制剂检查。不过，过度释放免疫系统会导致副作用或对身体有更坏的影响。至少有一种肿瘤基因测试 TMB （肿瘤突变负荷），保证对符合资格接受免疫肿瘤治疗 （I-O） 的病人减低危险。 TMB （肿瘤突变负荷）不需要知道基因的详情，只需要计算在活体组织检查中抽取的肿瘤细胞突变数。细胞突变数量超过 15 的病人一般都符合接受免疫肿瘤治疗 （I-O）的资格。如果细胞突变数量较少，病人也可以接受另一种救治方法 —基因标靶测试（ PD-L1），并重新获得治疗资格。

The chart below displays lung cancer, where FDA has now moved to approve chemotherapy-free treatments. There are 1.5 million lung cancer deaths annually – higher than prostate, colorectal, and breast cancers combined.

以下图表显示美国食品药品监督管理局（ FDA）已批准肺癌病人接受免化疗疗法。每年有一百五十万肺癌病人死亡，这远高于前列腺癌、结肠癌和乳癌死亡人数的总和。

What is the forecasted cost-effectiveness of these drugs? Compared to prior standards of care, which could not increase survival, the combination of TMB and Keytruda appears to be cost-neutral for lung cancer, and cost-effective for metastatic melanoma. More clinical trials are needed to increase confidence of C-E assessments, but an anti-tumor 'memory' effect has been seen after 18 weeks of treatment in the majority of patients in one such study that may eventually limit the expenditures to roughly $70K cost (Keytruda price is ~$23K for 6 weeks).

这些药物的预期成本效益如何？与先前无法增加存活率的治疗标准相比，TMB 和 Keytruda 的组合似乎对肺癌有差不多的成本效益，但是对于转移性黑色素瘤则具有良好的成本效益。在此一类研究中，大多数患者在治疗 18 周后，身体会产生对抗肿瘤的"记忆"效应，最终能将支出限制在大约七万美金左右（Keytruda 的花费是大约每六周两万三千美金）。不过，这需要更多的临床试验来增加对成本效益评估的信心。

SOA is eager to see more statistics over coming months on the cost comparison of I-O Therapy versus the current Standards of Care. However, the growing numbers of patients with decreased morbidity and mortality will bring significant outcry for coverage. Conversely, shorter treatment windows should limit outlays for insurers.

北美精算师协会（SOA）渴望在未来几个月内看到更多关于 I-O 疗法与现时标准疗法的费用比较和统计信息。不过随着患者数量的增加而发病率和死亡率的下降，人们将会强烈要求得到保障。相反，保险公司的支出亦会因较短的治疗窗口而有所控制。

The full research report can be found here: https://www.soa.org/resources/research-reports/2019/cancergenomics/.

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The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement and other topics. The SOA's research is intended to aid the work of policymakers and regulators and follow certain core principles:

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