

# Drug Policy:

## Keytruda™ (pembrolizumab)

<b>POLICY NUMBER</b> UM ONC_1263	<b>SUBJECT</b> Keytruda™ (pembrolizumab)		<b>DEPT/PROGRAM</b> UM Dept	<b>PAGE 1 of 9</b>
<b>DATES COMMITTEE REVIEWED</b> 11/12/14, 10/14/15, 07/26/16, 08/24/16, 03/08/17, 06/14/17, 06/13/18, 05/08/19, 09/11/19, 10/09/19, 12/11/19, 02/12/20, 03/11/20, 04/08/20, 05/13/20, 06/10/20, 08/12/20, 09/09/20, 12/09/20, 03/10/21, 04/14/21, 06/09/21, 07/14/21, 08/11/21, 09/08/21, 11/15/21, 12/8/21, 01/12/22, 03/09/22, 05/11/22, 06/08/22, 07/13/22, 09/20/22, 11/09/22, 12/14/22, 01/11/23, 02/08/23, 03/08/23, 05/10/23, 07/12/23, 10/11/23, 12/13/23, 01/10/24, 02/14/24, 06/12/24	<b>APPROVAL DATE</b> June 12, 2024	<b>EFFECTIVE DATE</b> June 28, 2024	<b>COMMITTEE APPROVAL DATES</b> 11/12/14, 10/14/15, 07/26/16, 08/24/16, 03/08/17, 06/14/17, 06/13/18, 05/08/19, 09/11/19, 10/09/19, 12/11/19, 02/12/20, 03/11/20, 04/08/20, 05/13/20, 06/10/20, 08/12/20, 09/09/20, 12/09/20, 03/10/21, 04/14/21, 06/09/21, 07/14/21, 08/11/21, 09/08/21, 11/15/21, 12/08/21, 01/12/22, 03/09/22, 05/11/22, 06/08/22, 07/13/22, 09/20/22, 11/09/22, 12/14/22, 01/11/23, 02/08/23, 03/08/23, 05/10/23, 07/12/23, 10/11/23, 12/13/23, 01/10/24, 02/14/24, 06/12/24	
<b>PRIMARY BUSINESS OWNER:</b> UM		<b>COMMITTEE/BOARD APPROVAL</b> Utilization Management Committee		
<b>NCQA STANDARDS</b> UM 2		<b>ADDITIONAL AREAS OF IMPACT</b>		
<b>CMS REQUIREMENTS</b>	<b>STATE/FEDERAL REQUIREMENTS</b>		<b>APPLICABLE LINES OF BUSINESS</b> Commercial, Exchange, Medicaid	

### I. PURPOSE

To define and describe the accepted indications for Keytruda (pembrolizumab) usage in the treatment of cancer, including FDA approved indications, and off-label indications.

Evolent is responsible for processing all medication requests from network ordering providers. Medications not authorized by Evolent may be deemed as not approvable and therefore not reimbursable.

The use of this drug must be supported by one of the following: FDA approved product labeling, CMS-approved compendia, National Comprehensive Cancer Network (NCCN), American Society of Clinical Oncology (ASCO) clinical guidelines, or peer-reviewed literature that meets the requirements of the CMS Medicare Benefit Policy Manual Chapter 15.

### II. INDICATIONS FOR USE/INCLUSION CRITERIA

#### A. Continuation requests for a not-approvable medication shall be exempt from this Evolent policy provided:

1. The member has not experienced disease progression on the requested medication **AND**
2. The requested medication was used within the last year without a lapse of more than 30 days of having an active authorization **AND**
3. Additional medication(s) are not being added to the continuation request.

## B. Cervical Cancer

1. Keytruda (pembrolizumab) + Carboplatin/Cisplatin + Taxol (paclitaxel) may be used as first line or subsequent therapy for members with advanced/recurrent/metastatic cervical carcinoma whose tumors express PD-L1 CPS greater than or equal to 1% **OR**
2. Keytruda (pembrolizumab) will be used in members with advanced/recurrent/metastatic cervical carcinoma whose tumors express PD-L1 CPS greater than or equal to 1% as a single agent as second line or subsequent therapy following disease progression on or after prior chemotherapy treatment, with no exposure to prior Keytruda (pembrolizumab) or another Immune Checkpoint Inhibitor.
3. **NOTE:** [Carboplatin/Cisplatin + Taxol (paclitaxel) + Keytruda (pembrolizumab) + Bevacizumab] is not supported by Evolent Keytruda Policy for members with advanced/metastatic cervical carcinoma in members whose tumors express PD-L1 CPS greater than or equal to 1%. This policy position is based on the findings of KEYNOTE 826 trial (see reference below). The latter trial showed no additional benefit for patient outcomes (PFS and OS) with the addition of bevacizumab to the above 3-drug regimen, [Carboplatin/Cisplatin + Taxol (paclitaxel) + Keytruda (pembrolizumab)]. The recommended alternative regimen by Evolent is detailed under item # 1 above.
4. Keytruda (pembrolizumab) may be used in members receiving chemoradiotherapy with advanced cervical carcinoma.

## C. Colorectal Cancer

1. Keytruda (pembrolizumab) may be used as a single agent for initial or subsequent therapy for members with unresectable/metastatic colorectal cancer whose tumors show deficient mismatch repair/microsatellite instability-high (dMMR/MSI-H). This requires confirmation of either dMMR **OR** MSI-High status by any standardized test.

## D. Cutaneous Squamous Cell Carcinoma (CSCC)

1. Keytruda (pembrolizumab) may be used as monotherapy for the treatment of members with recurrent, advanced, or metastatic cutaneous squamous cell carcinoma and are not candidates for curative surgery and/or curative radiation.

## E. Endometrial Carcinoma

1. Keytruda (pembrolizumab) may be used as first line therapy in combination with carboplatin and paclitaxel for members with recurrent/metastatic (stage III and IV) endometrial carcinoma
2. Keytruda (pembrolizumab) may be used as a single agent as subsequent-line systemic therapy for unresectable or metastatic, microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR) tumor that has progressed following prior treatment **OR**
3. Keytruda (pembrolizumab) may be used with Lenvima (lenvatinib) as subsequent therapy after disease progression on prior chemotherapy, in members who have not received prior therapy with an Immune Checkpoint Inhibitor and whose tumors are MSI-Stable or MMR-proficient (not MSI-High/deficient MMR).

## F. Gastric Cancer or Esophageal and Esophagogastric Junction Cancers

1. The member has unresectable locally advanced, recurrent, or metastatic gastric cancer or esophageal and EGJ adenocarcinoma **AND**
2. Keytruda (pembrolizumab) will be used as any **ONE** of the following:
  - a. As first line therapy in combination with fluoropyrimidine and platinum containing chemotherapy **AND** CPS of 1% or higher.
  - b. As first line therapy in combination with fluoropyrimidine and platinum containing chemotherapy with trastuzumab for members with HER-2 positive disease, regardless of PD-L1 level.

- c. As second line or subsequent therapy as a single agent for esophageal squamous cell carcinoma with PD-L1 expression by CPS of 10 or higher.
- d. As second-line or subsequent therapy for microsatellite instability-high (MSI-H) or deficient mismatch repair (dMMR) tumors.

#### **G. Head and Neck Cancer**

1. The member has unresectable, recurrent, or metastatic non-nasopharyngeal squamous cell carcinoma of the head and neck **AND** Keytruda (pembrolizumab) will be used for:
  - a. First line therapy
    - i. As a single agent for tumors that express PD-L1 (either CPS-Combined Positive Score or TPS-Tumor Proportion Score) greater than or equal to 1% **OR**
    - ii. In combination with chemotherapy, regardless of the PD-L1 expression score
  - b. Subsequent therapy as a single agent for disease progression on or after platinum-based chemotherapy, regardless of the PD-L1 expression score.
  - c. **NOTE: Keytruda (pembrolizumab) + Erbitux (cetuximab) combination is not supported by Evolent Keytruda policy for the initial and subsequent treatment of non-nasopharyngeal cancers. This policy position is based on the lack of Level 1 Evidence (randomized clinical trial and/or meta-analyses) to show superior outcomes compared to Evolent recommended alternatives agents/regimens, including but not limited to regimens at <http://pathways.newcenturyhealth.com>.**

#### **H. Hepatocellular Carcinoma (HCC)**

1. Keytruda (pembrolizumab) will be used in members with hepatocellular carcinoma who have not received prior therapy with an Immune Checkpoint Inhibitor, and have experienced disease progression on or after Nexavar (sorafenib), Lenvima (Lenvatinib), or Stivarga (regorafenib) unless intolerance or contraindications exist to the above 3 agents **OR**
2. For subsequent treatment as a single agent for progression on or after systemic treatment for unresectable or metastatic disease that is microsatellite instability-high (MSI-H) and/or deficient mismatch repair (dMMR) **AND**
3. **NOTE: Keytruda use in this disease is limited to members with liver function of Child Pugh Class A and B only, and members who have not received previous therapy with an immune checkpoint inhibitor [e.g., Tecentriq (atezolizumab)].**

#### **I. Hodgkin's Lymphoma**

1. The member has refractory or relapsed Hodgkin's Lymphoma and is not a candidate for HSCT and Keytruda (pembrolizumab) will be used as a single agent.

#### **J. Melanoma**

1. Keytruda (pembrolizumab) will be used as single agent for **ONE** of the following:
  - a. In adult or pediatric members greater than or equal to 12 years of age as adjuvant therapy for Stages IIb, IIc, and III melanoma following complete resection of the primary tumor (when identified) with or without a complete regional lymph node dissection. **NOTE: The maximum total duration of therapy is 1 year in the adjuvant setting.**
  - b. As neoadjuvant therapy for stage IIIB and IVC melanoma that is amenable to surgical resection; above neoadjuvant therapy (generally 3 cycles) may be followed by a total of 15 additional cycles of adjuvant Keytruda.
  - c. For unresectable or metastatic melanoma and the member had no prior disease progression on a PD-L1/PD-1 inhibitor.

#### **K. Merkel Cell Carcinoma (MCC)**

1. Keytruda (pembrolizumab) may be used as a single agent in members with recurrent/locally advanced/metastatic Merkel Cell Carcinoma regardless of the line of therapy.

#### **L. Microsatellite Instability-High or Mismatch Repair Deficient Cancer**

1. Keytruda (pembrolizumab) may be used in members with a metastatic /unresectable solid tumor that has progressed following prior treatment, including all satisfactory treatment alternatives and the solid tumor is positive for microsatellite instability-high (MSI-H) or deficient mismatch repair (dMMR) as confirmed by any standardized test for the above biomarker.

#### **M. Non-Muscle Invasive Bladder Cancer**

1. The member has high risk non-muscle invasive bladder cancer with carcinoma in situ (CIS), with or without papillary tumors, and Keytruda (pembrolizumab) will be used as monotherapy, for intravenous administration, in members who are refractory to local (intravesical) therapy with Bacillus Calmette-Guérin (BCG). Refractory is defined as a loss of response to treatment within 12 months of maintenance therapy with at least the first course of induction (5-6 doses) followed by at least 2 doses of maintenance BCG or the loss of response with the second induction course (of at least 2 doses) of BCG treatment.

#### **N. Non-Small Cell Lung Cancer (NSCLC) – Squamous and Non-Squamous**

1. Keytruda (pembrolizumab) will be used for **ONE** of the following:
  - a. As first line therapy in advanced, recurrent, or metastatic disease:
    - i. As a single agent if member's NSCLC is negative for EGFR and ALK (biomarkers not required for squamous histology) **AND** the tumor PD-L1 expression (either CPS-Combined Positive Score, or TPS-Tumor Proportion Score) is greater than or equal to 50% **OR**
    - ii. As a single agent if member's NSCLC is negative for EGFR and ALK (biomarkers not required for squamous histology) **AND** the PDL1 is greater than or equal to 1% and concurrent chemotherapy cannot be given or is contraindicated **OR**
    - iii. In combination with pemetrexed and platinum chemotherapy in members with non-squamous histology if EGFR and ALK genomic alterations are negative (biomarkers not required for squamous histology), regardless of the PD-L1 level **OR**
    - iv. In combination with carboplatin and paclitaxel or nab-paclitaxel (if there is a history of a severe allergic reaction, anaphylaxis, or intolerance to paclitaxel) in members with squamous cell histology, regardless of the PD-L1 level.
  - b. As continuation maintenance therapy in advanced, recurrent, or metastatic disease, in combination with pemetrexed (non-squamous histology **ONLY**) or as a single agent, in members who have achieved complete response/partial response/stable disease following first line therapy with a regimen that included chemotherapy + Keytruda (pembrolizumab).
  - c. As subsequent therapy in advanced, recurrent, or metastatic disease as a single agent for tumors with PD-L1 expression levels greater than or equal to 1% and the member had no prior progression on a PD-L1/PD-1 inhibitor.
  - d. As neoadjuvant therapy (with platinum-based chemotherapy) for 4 cycles for locally advanced- stages II, IIIA and IIB Non-Small Cell Lung Cancer; above may be followed by a maximum of 13 additional cycles of Keytruda as continuation/adjuvant therapy.
  - e. As adjuvant monotherapy, up to 12 months, following complete resection and platinum-based chemotherapy for members with stage IB (tumors  $\geq 4$  cm in diameter), II, or IIIA NSCLC, regardless of PD-L1 status.
2. **NOTE: [Keytruda (pembrolizumab) + Carboplatin + Abraxane (albumin-bound paclitaxel)] is not supported by Evolent Keytruda Policy for the treatment of NSCLC based on the results of**

the KEYNOTE- 407 trial which showed equivalent Progression Free Survival and Overall Survival with both Abraxane (albumin-bound paclitaxel) and Taxol (solvent-based paclitaxel). KEYNOTE-407 is referenced below. Please refer to alternative agents/regimens recommended by Evolent including but not limited to regimens available at <http://pathways.newcenturyhealth.com>.

#### **O. Primary Mediastinal Large B-Cell Lymphoma (PMBCL)**

1. Keytruda (pembrolizumab) may be used as a single agent in relapsed or refractory primary mediastinal large B-cell lymphoma.

#### **P. Renal Cell Carcinoma (RCC)**

1. The member has advanced or metastatic RCC and Lenvima (lenvatinib) may be used in combination with Keytruda (pembrolizumab) as first line therapy.
2. Keytruda (pembrolizumab) may be used in combination with Inlyta (axitinib) as first line treatment for members with IMDC favorable risk advanced/metastatic RCC who have not experienced prior disease progression on Inlyta (axitinib) and/or PD-L1/PD-1 inhibitor (e.g., avelumab, pembrolizumab, nivolumab).
3. Keytruda (pembrolizumab) may be used as a single agent for adjuvant therapy in resected renal cell carcinoma if any **ONE** of the following criteria are met:
  - a. Stage II disease with grade 4 histology or with sarcomatoid differentiation
  - b. Stage III or higher disease
  - c. Regional nodal metastases
  - d. M1 NED: Member with resectable metastases at diagnosis and surgical resection of the primary and of the metastatic lesions (within 1 year of nephrectomy) and no evidence of metastatic disease prior to starting Keytruda (pembrolizumab).

#### **Q. Small Cell Lung Cancer (SCLC)**

1. **NOTE:** Single agent Keytruda (pembrolizumab) is not supported by Evolent Keytruda Policy for the treatment of metastatic SCLC following disease progression on platinum-based chemotherapy and/or at least one other line of therapy (e.g., topotecan, irinotecan, paclitaxel, docetaxel). The above indication was withdrawn by the FDA based on confirmatory study, KEYNOTE-604 failed to meet the primary endpoint of overall survival compared to chemotherapy. Please refer to alternative agents/regimens recommended by Evolent including but not limited to regimens available at <http://pathways.newcenturyhealth.com>.

#### **R. Soft Tissue Sarcoma**

1. **NOTE:** Single agent Keytruda (pembrolizumab) is not supported by Evolent Keytruda Policy for the following soft tissue sarcomas: cutaneous angiosarcoma, undifferentiated sarcomas, myxofibrosarcoma, undifferentiated pleomorphic sarcoma. This policy position is based on the lack of Level 1 Evidence (randomized clinical trial and/or meta-analyses) to show superior outcomes with Keytruda (pembrolizumab) compared to Evolent recommended alternatives agents/regimens, including but not limited to regimens at <http://pathways.newcenturyhealth.com>.

#### **S. Triple Negative Breast Cancer (TNBC)**

1. Keytruda (pembrolizumab) may be used for the following:
  - a. As a part of neoadjuvant therapy in combination with chemotherapy and subsequent adjuvant therapy in a member with newly diagnosed high-risk early-stage TNBC (a tumor size greater than 1 cm, less than or equal to 2 cm in diameter with nodal involvement, or tumor size greater than 2 cm in diameter regardless of nodal involvement. **NOTE** Keytruda may be used as a part of the member's adjuvant therapy **ONLY** if the member received pembrolizumab in the neoadjuvant setting.

- b. In members with locally recurrent unresectable or metastatic TNBC whose tumors express PD-L1 with a Combined Positive Score (CPS) greater than or equal to 10.
2. **NOTE: Keytruda (pembrolizumab) + Abraxane (nab-paclitaxel) regimen is not supported by Evolent Policies for Keytruda and Abraxane, for the treatment of recurrent unresectable or metastatic breast cancer. This policy position is based on the results of the KEYNOTE 355 trial (referenced below) which showed equivalent outcomes (PFS and OS) in patients treated with Abraxane(nab-paclitaxel) and Taxol (paclitaxel). Please refer to alternative agents/regimens recommended by Evolent, including but not limited to regimens available at <http://pathways.newcenturyhealth.com>.**

#### **T. Tumor Mutational Burden-High (TMB-H) Cancer**

1. Keytruda (pembrolizumab) may be used as a single agent in members with unresectable or metastatic solid tumors with a high tumor mutational burden, TMB- H greater than or equal to 10 mutations/megabase (mut/Mb), that have progressed following prior anti-cancer treatment and have no satisfactory alternative anti-cancer treatment options.

#### **U. Urothelial Carcinoma including Upper Urinary Tract Carcinoma and Carcinoma of Urethra**

1. Keytruda (pembrolizumab) monotherapy may be used in members with recurrent/metastatic urothelial cancer who are not eligible for platinum-based chemotherapy or who have disease progression during or after platinum containing chemotherapy.
2. Keytruda (pembrolizumab) and Padcev (enfortumab vedotin-efv) may be used as first line therapy for locally advanced/metastatic urothelial carcinoma

### **III. EXCLUSION CRITERIA**

- A. Disease progression on Keytruda (pembrolizumab) containing regimen or prior checkpoint inhibitor (PD-1/PD-L1) therapy, except when Keytruda (pembrolizumab) is being used as part of neoadjuvant/adjuvant therapy in the treatment of early stage TNBC.
- B. Lack of EGFR & ALK test results when being used in the first line therapy (as a single agent or in combination with chemotherapy) of metastatic/recurrent non-squamous or adenocarcinoma Non-Small Cell Lung Cancer.
- C. Dosing exceeds single dose limit of Keytruda (pembrolizumab) 200 mg every 3 weeks or 400 mg every 6 weeks,
- D. Length of Keytruda (pembrolizumab) treatment is greater than 12 months for adjuvant therapy of resected Melanoma or NSCLC.
- E. Investigational use of Keytruda (pembrolizumab) with an off-label indication that is not sufficient in evidence or is not generally accepted by the medical community. Sufficient evidence that is not supported by CMS recognized compendia or acceptable peer reviewed literature is defined as any of the following:
  1. Whether the clinical characteristics of the patient and the cancer are adequately represented in the published evidence.
  2. Whether the administered chemotherapy/biologic therapy/immune therapy/targeted therapy/other oncologic therapy regimen is adequately represented in the published evidence.
  3. Whether the reported study outcomes represent clinically meaningful outcomes experienced by patients. Generally, the definitions of Clinically Meaningful outcomes are those recommended by ASCO, e.g., Hazard Ratio of less than 0.80 and the recommended survival benefit for OS and PFS should be at least 3 months.
  4. Whether the experimental design, considering the drugs and conditions under investigation,



is appropriate to address the investigative question. (For example, in some clinical studies, it may be unnecessary or not feasible to use randomization, double blind trials, placebos, or crossover).

5. That non-randomized clinical trials with a significant number of subjects may be a basis for supportive clinical evidence for determining accepted uses of drugs.
6. That case reports are generally considered uncontrolled and anecdotal information and do not provide adequate supportive clinical evidence for determining accepted uses of drugs.
7. That abstracts (including meeting abstracts) without the full article from the approved peer-reviewed journals lack supporting clinical evidence for determining accepted uses of drugs.

#### **IV. MEDICATION MANAGEMENT**

- A. Please refer to the FDA label/package insert for details regarding these topics.

#### **V. APPROVAL AUTHORITY**

- A. Review – Utilization Management Department
- B. Final Approval – Utilization Management Committee

#### **VI. ATTACHMENTS**

- C. None

#### **VII. REFERENCES**

- A. Eskander RN, et al. Pembrolizumab plus Chemotherapy in Advanced Endometrial Cancer. *N Engl J Med*. 2023 Jun 8;388(23):2159-2170.
- B. Powles T, et al; EV-302 Trial Investigators. Enfortumab Vedotin and Pembrolizumab in Untreated Advanced Urothelial Cancer. *N Engl J Med*. 2024 Mar 7;390(10):875-888. doi: 10.1056/NEJMoa2312117
- C. Lorusso D, et al. LBA38 Pembrolizumab plus chemoradiotherapy for high-risk locally advanced cervical cancer: A randomized, double-blind, phase III ENGOT-cx11/GOG-3047/KEYNOTE-A18 study. *Annals of Oncology*. 2023 October; 34:S1279-S1280. DOI: <https://doi.org/10.1016/j.annonc.2023.10.032>
- D. Keytruda prescribing information. Merck & Co. Inc. 2024.
- E. Rha et al. KEYNOTE-859. *Lancet Oncol* 2023; 24: 1181–95. Published Online. October 21, 2023 [https://doi.org/10.1016/S1470-2045\(23\)00515-6](https://doi.org/10.1016/S1470-2045(23)00515-6)
- F. Gupta et al. Defining ‘platinum ineligibility’ in metastatic Urothelial Carcinoma. ASCO 2022, abstract 4577. *Journal of Clinical Oncology*. [https://doi.org/10.1200/jco.222.40.46\\_suppl.4577](https://doi.org/10.1200/jco.222.40.46_suppl.4577).
- G. Wakelee et al. KEYNOTE-671 trial. *N Engl J Med* 2023; 389:491-503. DOI: 10.1056/NEJMoa2302983
- H. Patel et al. SWOG 1801 trial. *N Engl J Med* 2023; 388:813-23. DOI: 10.1056/NEJMoa2211437
- I. O’Brian et al. PEARLS-KEYNOTE -091 Trial. *Lancet Oncol* 2022; 23: 1274–86. Published Online. September 12, 2022. [https://doi.org/10.1016/S1470-2045\(22\)00518-6](https://doi.org/10.1016/S1470-2045(22)00518-6). F. Powles, et al. Avelumab First-Line Maintenance for Advanced Urothelial Carcinoma: Results From the JAVELIN Bladder 100 Trial After ≥2 Years of Follow-Up. *Journal of Clinical Oncology* 2023; 41: 3486-3492. DOI:

<https://doi.org/10.1200/JCO.22.01792>

- J. Sun L, et al. Association Between Duration of Immunotherapy and Overall Survival in Advanced Non-Small Cell Lung Cancer. *JAMA Oncol.* 2023 Jun 4:e231891.
- K. Kim H, et al. Long-term outcomes in patients with advanced and/or metastatic non-small cell lung cancer who completed 2 years of immune checkpoint inhibitors or achieved a durable response after discontinuation without disease progression: Multicenter, real-world data (KCSG LU20-11). *Cancer.* 2022 Feb 15;128(4):778-787.
- L. Hoimes CJ, et al, EV-103/KEYNOTE-869 Clinical Trial. Enfortumab Vedotin Plus Pembrolizumab in Previously Untreated Advanced Urothelial Cancer. *J Clin Oncol.* 2023 Jan 1;41(1):22-31.
- M. O'Brien M, et al. EORTC-1416-LCG/ETOP 8-15 – PEARLS/KEYNOTE-091 Investigators. Pembrolizumab versus placebo as adjuvant therapy for completely resected stage IB-IIIa non-small-cell lung cancer (PEARLS/KEYNOTE-091): an interim analysis of a randomised, triple-blind, phase 3 trial. *Lancet Oncol.* 2022 Oct;23(10):1274-1286.
- N. Cortes et al. KEYNOTE 355 trial. *Lancet* 2020; 396: 1817–28
- O. Balar AV, et al. Pembrolizumab monotherapy for the treatment of high-risk non-muscle-invasive bladder cancer unresponsive to BCG (KEYNOTE-057): an open-label, single-arm, multicentre, phase 2 study. *Lancet Oncol.* 2021 Jul;22(7):919-930.
- P. Florou V, et al. Angiosarcoma patients treated with immune checkpoint inhibitors: a case series of seven patients from a single institution. *J Immunother Cancer.* 2019 Aug 8;7(1):213.
- Q. Paz-Ares L, et al. A Randomized, Placebo-Controlled Trial of Pembrolizumab Plus Chemotherapy in Patients With Metastatic Squamous NSCLC: Protocol-Specified Final Analysis of KEYNOTE-407. *J Thorac Oncol.* 2020 Oct;15(10):1657-1669.
- R. Paz-Ares L, et al. KEYNOTE-407 Trial. Pembrolizumab plus Chemotherapy for Squamous Non-Small-Cell Lung Cancer. *N Engl J Med.* 2018 Nov 22;379(21):2040-2051.
- S. Powles T, et al. Pembrolizumab plus axitinib versus sunitinib monotherapy as first-line treatment of advanced renal cell carcinoma (KEYNOTE-426): extended follow-up from a randomised, open-label, phase 3 trial. *Lancet Oncol.* 2020 Dec;21(12):1563-1573.
- T. Rini BI, et al. KEYNOTE-426 Clinical Trial. Pembrolizumab plus Axitinib versus Sunitinib for Advanced Renal-Cell Carcinoma. *N Engl J Med.* 2019 Mar 21;380(12):1116-1127.
- U. Rudin CM, et al. KEYNOTE-604 Clinical Trial. Pembrolizumab or Placebo Plus Etoposide and Platinum as First-Line Therapy for Extensive-Stage Small-Cell Lung Cancer: Randomized, Double-Blind, Phase III KEYNOTE-604 Study. *J Clin Oncol.* 2020 Jul 20;38(21):2369-2379.
- V. Shitara K, et al. Efficacy and Safety of Pembrolizumab or Pembrolizumab Plus Chemotherapy vs Chemotherapy Alone for Patients With First-line, Advanced Gastric Cancer: The KEYNOTE-062 Phase 3 Randomized Clinical Trial. *JAMA Oncol.* 2020 Oct 1;6(10):1571-1580.
- W. Makker V, et al. Lenvatinib Plus Pembrolizumab in Patients With Advanced Endometrial Cancer. *J Clin Oncol.* 2020 Sep 10;38(26):2981-2992.
- X. Colombo N, et al. KEYNOTE-826 Investigators. Pembrolizumab for Persistent, Recurrent, or Metastatic Cervical Cancer. *N Engl J Med.* 2021 Nov 11;385(20):1856-1867.
- Y. Choueiri TK, et al. KEYNOTE-564 Investigators. Adjuvant Pembrolizumab after Nephrectomy in Renal-Cell Carcinoma. *N Engl J Med.* 2021 Aug 19;385(8):683-694.



- Z. Schmid P, et al. KEYNOTE-522 Investigators. Pembrolizumab for Early Triple-Negative Breast Cancer. *N Engl J Med*. 2020 Feb 27;382(9):810-821.
- AA. Motzer R, et al. CLEAR Trial Investigators. Lenvatinib plus Pembrolizumab or Everolimus for Advanced Renal Cell Carcinoma. *N Engl J Med*. 2021 Apr 8;384(14):1289-1300.
- BB. Chung HC, et al. First-line pembrolizumab/placebo plus trastuzumab and chemotherapy in HER2-positive advanced gastric cancer: KEYNOTE-811. *Future Oncol*. 2021 Feb;17(5):491-501.
- CC. Marabelle A, et al. Association of tumour mutational burden with outcomes in patients with advanced solid tumours treated with pembrolizumab: prospective biomarker analysis of the multicohort, open-label, phase 2 KEYNOTE-158 study. *Lancet Oncol*. 2020 Oct;21(10):1353-1365.
- DD. Marcus L, et al. FDA Approval Summary: Pembrolizumab for the Treatment of Microsatellite Instability-High Solid Tumors. *Clin Cancer Res*. 2019 Jul 1;25(13):3753-3758.
- EE. Cortes J, et al. KEYNOTE-355 Investigators. Pembrolizumab plus chemotherapy versus placebo plus chemotherapy for previously untreated locally recurrent inoperable or metastatic triple-negative breast cancer (KEYNOTE-355): a randomized, placebo-controlled, double-blind, phase 3 clinical trial. *Lancet*. 2020 Dec 5;396(10265):1817-1828.
- EE. Keytruda prescribing information. Merck & Co. Inc. 2023.
- FF. Clinical Pharmacology Elsevier Gold Standard 2023.
- GG. Micromedex® Healthcare Series: Micromedex Drugdex Ann Arbor, Michigan 2023.
- HH. National Comprehensive Cancer Network. Cancer Guidelines and Drugs and Biologics Compendium 2023
- II. AHFS Drug Information. American Society of Health-Systems Pharmacists or Wolters Kluwer Lexi-Drugs Bethesda, MD 2023.
- JJ. Ellis LM, et al. American Society of Clinical Oncology perspective: Raising the bar for clinical trials by defining clinically meaningful outcomes. *J Clin Oncol*. 2014 Apr 20;32(12):1277-80.
- KK. Medicare Benefit Policy Manual Chapter 15 Covered Medical and Other Health Services: <https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/bp102c15.pdf>.