

**Thank you for joining us.  
The program will commence momentarily.**

# Clinical Investigator Perspectives on the Current and Future Role of PARP Inhibition in the Management of Ovarian Cancer

*A Meet The Professor Series*

**Don S Dizon, MD**

Professor of Medicine, Brown University

Director, Women's Cancers and Hematology-Oncology Outpatient Clinics

Lifespan Cancer Institute

Director, Medical Oncology and the Oncology Sexual Health Program

Rhode Island Hospital

Providence, Rhode Island

## Commercial Support

These activities are supported by an educational grant from GlaxoSmithKline.

## Dr Love — Disclosures

**Dr Love** is president and CEO of Research To Practice. Research To Practice receives funds in the form of educational grants to develop CME activities from the following commercial interests: AbbVie Inc, Acerta Pharma — A member of the AstraZeneca Group, Adaptive Biotechnologies Corporation, Agendia Inc, Agios Pharmaceuticals Inc, Amgen Inc, Array BioPharma Inc, a subsidiary of Pfizer Inc, Astellas, AstraZeneca Pharmaceuticals LP, Bayer HealthCare Pharmaceuticals, Biodesix Inc, bioTheranostics Inc, Blueprint Medicines, Boehringer Ingelheim Pharmaceuticals Inc, Boston Biomedical Inc, Bristol-Myers Squibb Company, Celgene Corporation, Clovis Oncology, Daiichi Sankyo Inc, Dendreon Pharmaceuticals Inc, Eisai Inc, EMD Serono Inc, Exelixis Inc, Foundation Medicine, Genentech, a member of the Roche Group, Genmab, Genomic Health Inc, Gilead Sciences Inc, GlaxoSmithKline, Grail Inc, Guardant Health, Halozyme Inc, Helsinn Healthcare SA, ImmunoGen Inc, Incyte Corporation, Infinity Pharmaceuticals Inc, Ipsen Biopharmaceuticals Inc, Janssen Biotech Inc, administered by Janssen Scientific Affairs LLC, Jazz Pharmaceuticals Inc, Kite, A Gilead Company, Lexicon Pharmaceuticals Inc, Lilly, Loxo Oncology Inc, a wholly owned subsidiary of Eli Lilly & Company, Merck, Merrimack Pharmaceuticals Inc, Myriad Genetic Laboratories Inc, Natera Inc, Novartis, Oncopeptides, Pfizer Inc, Pharmacyclics LLC, an AbbVie Company, Prometheus Laboratories Inc, Puma Biotechnology Inc, Regeneron Pharmaceuticals Inc, Sandoz Inc, a Novartis Division, Sanofi Genzyme, Seattle Genetics, Sirtex Medical Ltd, Spectrum Pharmaceuticals Inc, Taiho Oncology Inc, Takeda Oncology, Tesaro, A GSK Company, Teva Oncology, Tokai Pharmaceuticals Inc, Tolero Pharmaceuticals and Verastem Inc.

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Planners, scientific staff and independent reviewers for Research To Practice have no relevant conflicts of interest to disclose.

## Dr Dizon — Disclosures

<b>Consulting Agreements</b>	AstraZeneca Pharmaceuticals LP, Clovis Oncology, GlaxoSmithKline, Regeneron Pharmaceuticals Inc
<b>Contracted Research</b>	Bristol-Myers Squibb Company, GlaxoSmithKline, Kazia Therapeutics Limited
<b>Data and Safety Monitoring Board/Committee</b>	AstraZeneca Pharmaceuticals LP, Clovis Oncology, Regeneron Pharmaceuticals Inc

## Upcoming Live Webinars

**Friday, August 21, 2020**  
**12:00 PM – 1:00 PM ET**

**Optimizing the Selection and  
Sequencing of Therapy for  
Patients with Chronic  
Lymphocytic Leukemia**

**Faculty**

Brad S Kahl, MD

**Moderator**

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and Other Novel Strategies in  
Gynecologic Cancers**

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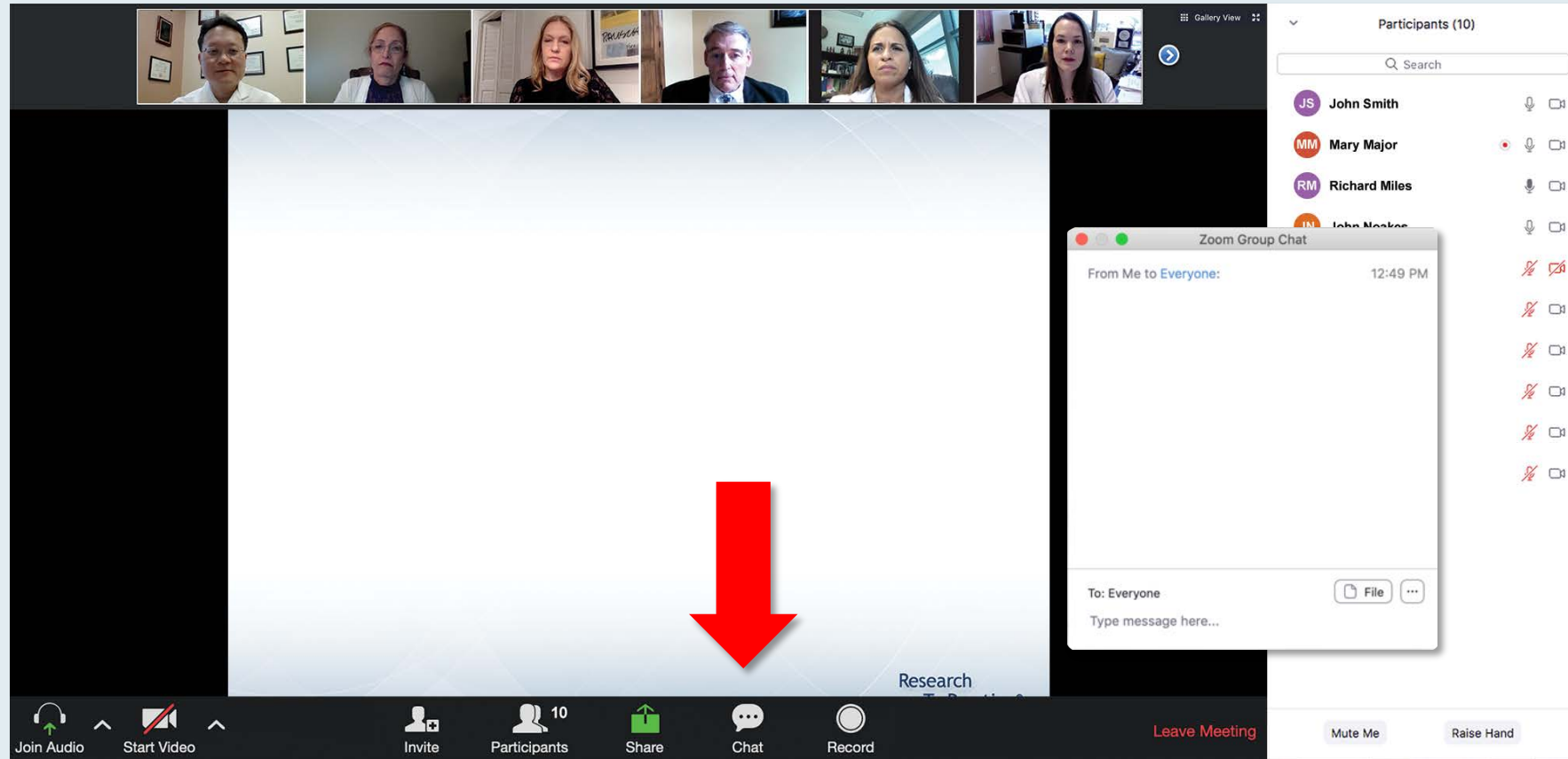
Michael J Birrer, MD, PhD

**Moderator**

Neil Love, MD



# We Encourage Clinicians in Practice to Submit Questions



**Feel free to submit questions now before the program commences and throughout the program.**

# Familiarizing yourself with the Zoom interface

## How to answer poll questions

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What is your usual treatment recommendation for a patient with MM who has experienced an asymptomatic relapse followed by ASCT within 2 years who then experiences a clinical relapse?

Quick Poll

- ☐ Carfilzomib +/- dexamethasone
- ☐ Pomalidomide +/- dexamethasone
- ☐ Carfilzomib + pomalidomide +/- dexamethasone
- ☐ Elotuzumab + lenalidomide +/- dexamethasone
- ☐ Elotuzumab + pomalidomide +/- dexamethasone
- ☐ Daratumumab + lenalidomide +/- dexamethasone
- ☐ Daratumumab + pomalidomide +/- dexamethasone
- ☐ Daratumumab + bortezomib +/- dexamethasone
- ☐ Ixazomib + Rd
- ☐ Other

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Participants (10)

Search

- JS John Smith
- MM Mary Major
- RM Richard Miles
- JN John Noakes
- AS Alice Suarez
- JP Jane Perez
- RS Robert Stiles
- JF Juan Fernandez
- AK Ashok Kumar
- JS Jeremy Smith

When a poll question pops up, click your answer choice from the available options.  
Results will be shown after everyone has answered.

***Thank you for joining us!***

***CME and MOC credit information will be emailed to each participant within 5 days.***

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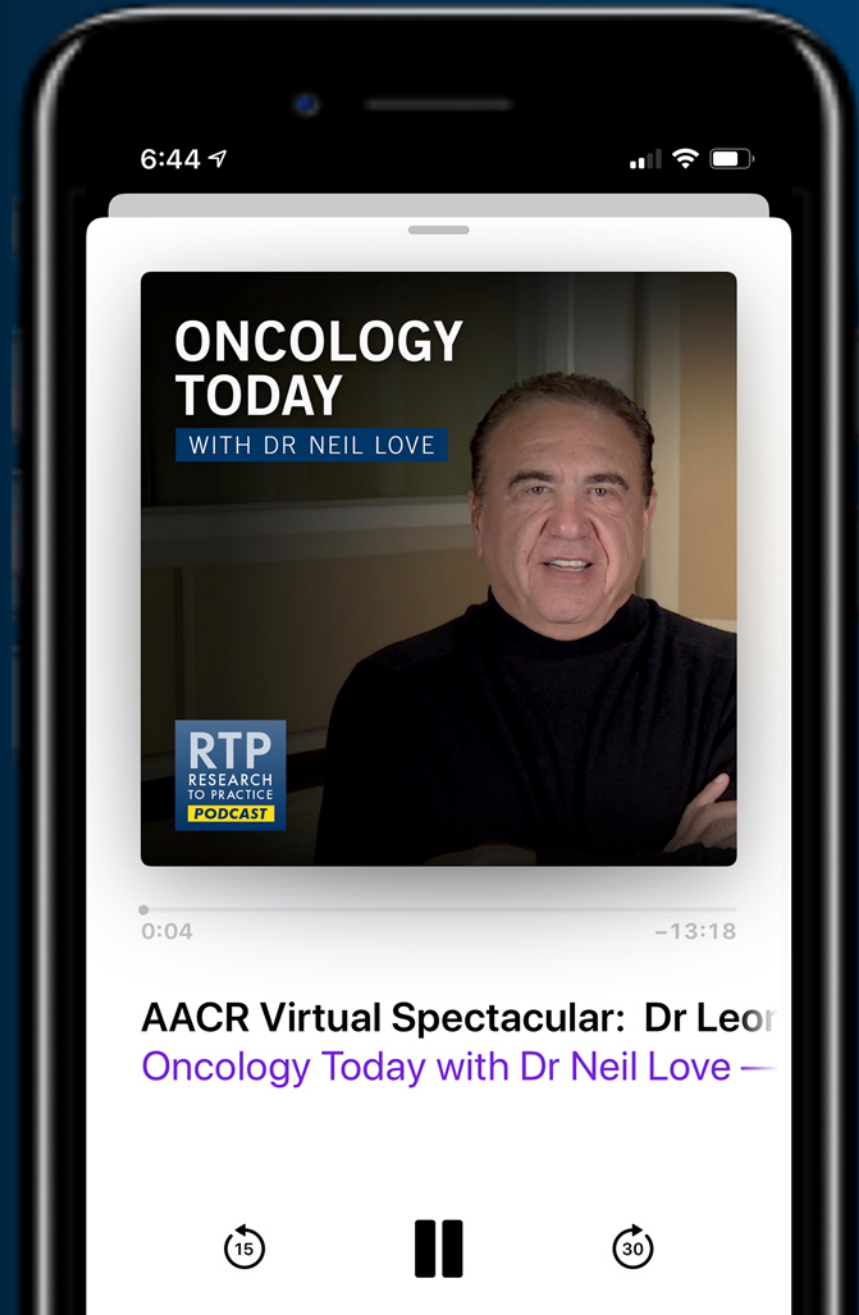
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Providence, Rhode Island

# ***Meet The Professor Program Participating Faculty***



**Deborah K Armstrong, MD**

Professor of Oncology  
Professor of Gynecology and Obstetrics  
Skip Viragh Outpatient Cancer Building  
Johns Hopkins Sidney Kimmel  
Comprehensive Cancer Center  
Baltimore, Maryland



**Professor Jonathan A Ledermann**

Professor of Medical Oncology  
Clinical Director  
University College London Cancer  
Institute  
Director, Cancer Research UK and UCL  
Cancer Trials Centre  
London, United Kingdom



**Don S Dizon, MD**

Professor of Medicine, Brown University  
Director, Women's Cancers and Hematology-  
Oncology Outpatient Clinics  
Lifespan Cancer Institute  
Director, Medical Oncology and the Oncology  
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Rhode Island Hospital  
Providence, Rhode Island



**Ursula Matulonis, MD**

Chief, Division of Gynecologic Oncology  
Brock-Wilson Family Chair  
Dana-Farber Cancer Institute  
Professor of Medicine  
Harvard Medical School  
Boston, Massachusetts



# Meet The Professor Program Participating Faculty



**Mansoor Raza Mirza, MD**

Medical Director, Nordic Society of Gynaecological Oncology  
Vice-Chairman, Danish Society of Gynaecologic Oncology  
Executive Director, Gynecologic Cancer InterGroup  
Chief Oncologist, Department of Oncology  
Rigshospitalet, Copenhagen University Hospital  
Copenhagen, Denmark



**Professor Ignace Vergote**

Chairman, Department of Obstetrics and Gynaecology  
Gynaecological Oncologist  
Leuven Cancer Institute  
University Hospital Leuven  
Leuven, Belgium



**Shannon N Westin, MD, MPH**

Associate Professor  
Director, Early Drug Development  
Department of Gynecologic Oncology and Reproductive Medicine  
The University of Texas  
MD Anderson Cancer Center  
Houston, Texas



**Kathleen Moore, MD**

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Associate Director, Clinical Research  
Director, Oklahoma TSET Phase I Program  
Stephenson Cancer Center  
Associate Professor, Section of Gynecologic Oncology  
Director, Gynecologic Oncology Fellowship  
Department of Obstetrics and Gynecology  
University of Oklahoma Health Sciences Center  
Oklahoma City, Oklahoma



***Project Chair***

**Neil Love, MD**

Research To Practice  
Miami, Florida

# We Encourage Clinicians in Practice to Submit Questions

The screenshot displays a Zoom meeting interface. At the top, a gallery view shows six participants. The main screen displays a presentation slide with the text: "You may submit questions using the Zoom Chat option below". A large red arrow points downwards from this text. On the right side, a "Participants (10)" list is visible, showing names like John Smith, Mary Major, Richard Miles, John Noakes, and Alice Suarez. Below this, a "Zoom Group Chat" window is open, showing a message from "Me to Everyone" at 12:49 PM. The bottom toolbar includes icons for "Join Audio", "Start Video", "Invite", "Participants" (showing 10), "Share", "Chat", "Record", and a "Leave Meeting" button. The word "Research" is partially visible at the bottom right of the slide.

Feel free to submit questions now before the program commences and throughout the program.



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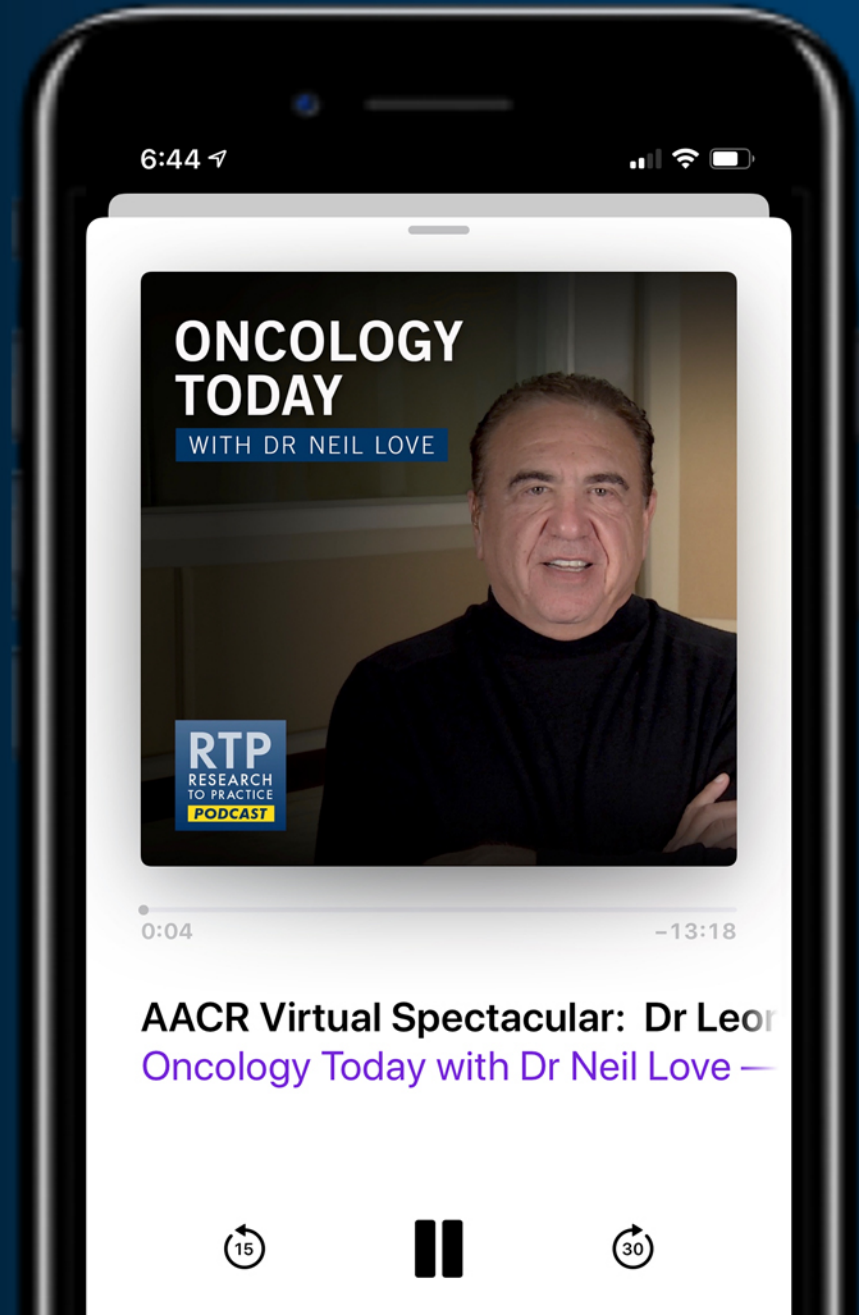
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Rhode Island Hospital

Providence, Rhode Island

# Contributing Oncologists



**Brian M Slomovitz, MD**

Professor, Department of Obstetrics and Gynecology  
Florida International University  
Miami, Florida



**Professor Ignace Vergote**

Chairman, Department of Obstetrics and Gynaecology  
Gynaecological Oncologist  
Leuven Cancer Institute  
University Hospital Leuven  
Leuven, Belgium



# Meet The Professor with Dr Dizon

## **MODULE 1: Management of Newly Diagnosed Ovarian Cancer**

- Case presentations
- Key clinical trials
  - SOLO-1, PRIMA, PAOLA

## **MODULE 2: PARP Inhibitors in the Management of Relapsed Disease**

- Case presentations
- Class and agent-specific toxicities; management strategies
- Key clinical trials
  - TOPACIO, MEDIOLA

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## **MODULE 1: Management of Newly Diagnosed Ovarian Cancer**

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**Are you currently administering more neoadjuvant treatment for patients with Stage III ovarian cancer at your institution than you were in 2019?**

1. Yes

2. No

## Challenging Comments and Questions



**Brian M Slomovitz, MD**

# What is the age of the oldest patient with Stage IIIC ovarian cancer for whom you have performed or ordered debulking surgery?

1. 65-70
2. 71-75
3. 76-80
4. 81-85
5. 86-90
6. 91-95
7. 96-100
8. Older than 100

**An 87-year-old woman with Stage IIIC ovarian cancer (BRCA wild type, HRD-positive) is s/p optimal debulking surgery. Regulatory and reimbursement issues aside, what would you recommend as postoperative systemic therapy?**

1. Carboplatin/paclitaxel
2. Carboplatin/paclitaxel → olaparib
3. Carboplatin/paclitaxel → niraparib
4. Carboplatin/paclitaxel + bev → olaparib
5. Carboplatin/paclitaxel + bev → niraparib
6. Carboplatin/paclitaxel + bev → bev/olaparib
7. Carboplatin/paclitaxel + bev → bev/niraparib
8. Other

Bev = bevacizumab

## Case Presentation – Prof Vergote: An 87-year-old woman with Stage IIIC ovarian cancer

- PMH: Hypertension, coronary artery stent
- High-grade Stage IIIC serous ovarian cancer, but not extensive disease
- Primary debulking surgery, with all tumor removed
- Paclitaxel/carboplatin 3-weekly x 6
- Somatic and germline BRCA-negative



Professor Ignace Vergote

### Questions

- What about patients who are HRD-negative, BRCA wild type? Would you also give bevacizumab? Would you also give a PARP inhibitor?
- Have you tried a PARP inhibitor after a PARP inhibitor, where there is not a lot of data? Have you seen responses with a PARP inhibitor – the same PARP inhibitor or another PARP inhibitor – after a former PARP inhibitor?

## Case Presentation – Dr Slomovitz: A 55-year-old woman

- Bilateral adnexal masses (8-cm, 7-cm), omental caking, large ascites, mesenteric implants
- CA-125: 2100
- CT guided biopsy: confirmed high grade serous carcinoma consistent with GYN primary
- Neoadjuvant chemotherapy: Carboplatin, paclitaxel x 3 cycles
- IDS: optimal cytoreduction with disease in omentum, b/l ovaries
- Genetic testing: no BRCA mutation, no mutations identified
- Somatic NGS: p53 pathogenic mutation
- HRD testing: +HRD
- Completed cycle 4-6 of carboplatin and paclitaxel and bevacizumab → NED

### Questions

- When should you stick with bevacizumab alone and not add a PARP inhibitor?
- When is it best to give combination therapy?
- When do you discontinue bevacizumab and just go to the PARP inhibitor?
- When do you discontinue therapy?
- How do you choose between olaparib, niraparib and rucaparib?



**Brian M Slomovitz, MD**

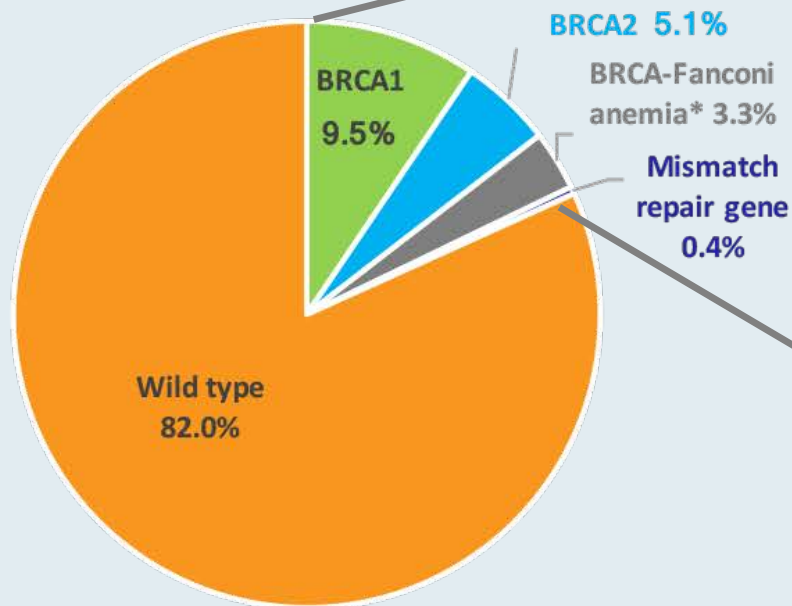


# Recent Relevant Data Sets

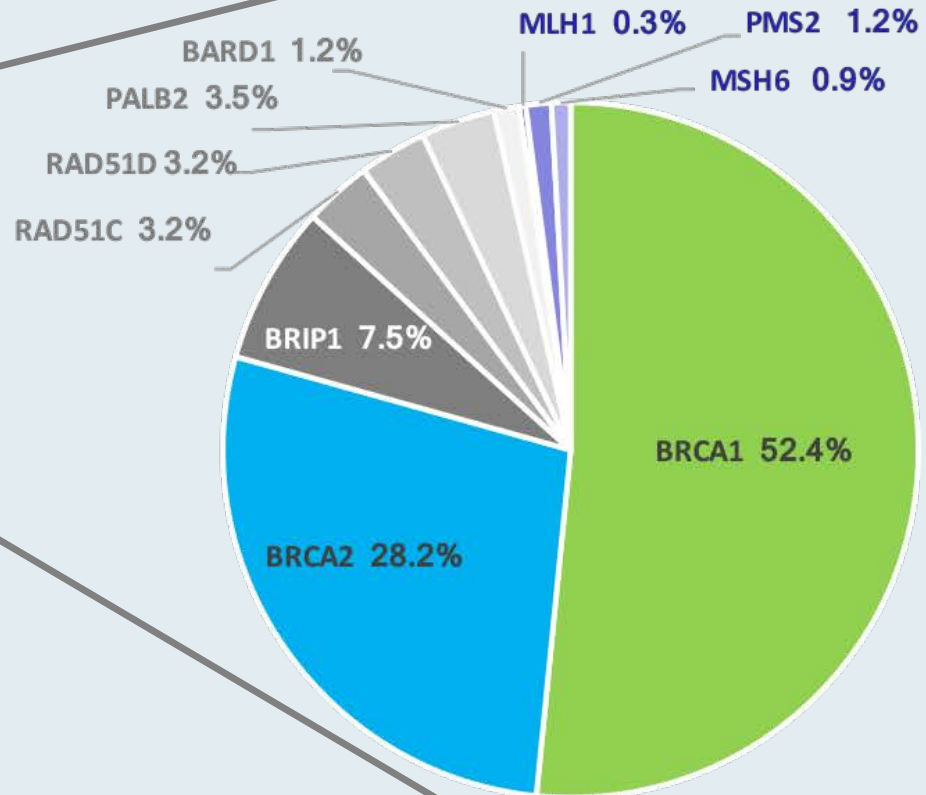
# Summary of Germline DNA Mutations in OC

- Germline DNA sequenced from women with OC (N = 1,915) using a targeted capture and multiplex sequencing assay
  - University of Washington GYN tissue bank (n = 570)
  - GOG-218 (n = 788) and GOG-262 (n = 557)

**Overall population  
(not selected for age or family history)**  
**N = 1,915**



**Patients with identified  
mutations in OC genes**  
**N = 347**



\* BRCA-Fanconi anemia-associated genes: BRIP1, PALB2, RAD51C, RAD51D, BARD1

# BRCA1/2 Mutations in Ovarian Cancer: Who Should Be Tested?

## NCCN<sup>1</sup>

Genetic counseling and testing should be considered for women with a history of ovarian carcinoma, fallopian tube or primary peritoneal cancer

## SGO<sup>2</sup>

Women diagnosed with epithelial ovarian, tubal and peritoneal cancers should receive genetic counseling and be offered genetic testing even in the absence of family history

## ASCO<sup>3</sup>

Genetic counseling and testing should be considered for women with epithelial ovarian, fallopian tube or primary peritoneal cancer even in the absence of family history

NCCN = National Comprehensive Cancer Network; SGO = Society of Gynecologic Oncology;

ASCO = American Society of Clinical Oncology

1. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines<sup>®</sup>) for Genetic/Familial High-Risk Assessment: Breast and Ovarian V2.2019.

2. Lancaster JM et al. *Gynecol Oncol* 2015;136(1):3-7.

3. Lu KH et al. *J Clin Oncol* 2014;32(8):833-40.

# Multigene Panel Testing

## Advantages

- More “diagnoses”
- More cost effective
- More time efficient
- Higher mutational detection rate
- Efficient use of single specimen
- Decrease in testing fatigue for patients and providers

## Disadvantages

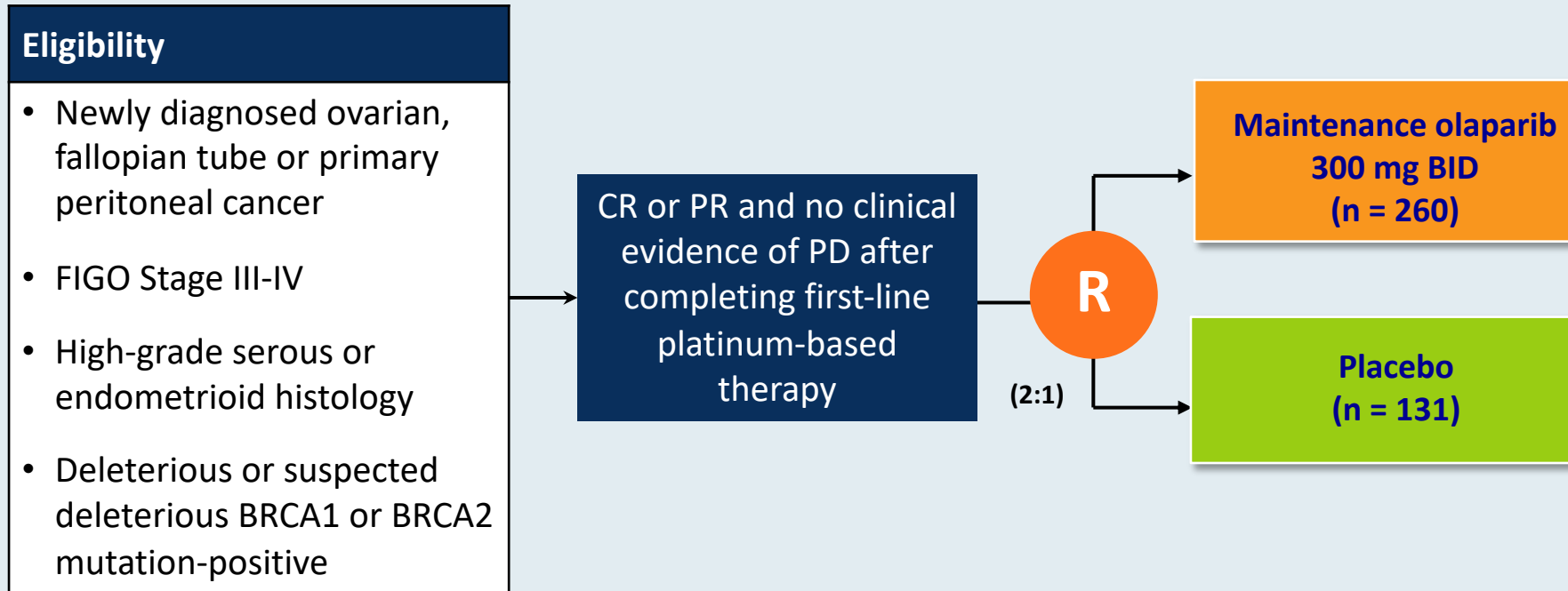
- Cancer risk and management options often not well defined for low- and moderate-penetrance genes
- High uncertain variant rate
- Longer turnaround time
- Panels may include genes that patients don’t want to test for
- Unexpected findings such as “off-phenotypic-target” gene mutation
- Increased prevalence of VUS

# Current FDA-Approved and Investigational PARP Inhibitors: Differences

PARP inhibitor	IC <sub>50</sub>	PARP trapping potency	PARPi target selectivity (strength of binding)	Half life	Dose
Olaparib	6 nM	1	Potent PARP1 inhibitor, less selective	11.9 hours	400 mg BID
Rucaparib	21 nM	1	Potent PARP1 inhibitor, less selective	18 hours	600 mg BID
Niraparib	60 nM	~2	Selective inhibitor of PARP1 and 2	36 hours	300 mg qd
Veliparib	30 nM	<0.2	Potent PARP1 inhibitor, less selective	5 hours	400 mg BID
Talazoparib	4 nM	~100	Potent PARP1 inhibitor, less selective	50 hours	1 mg qd

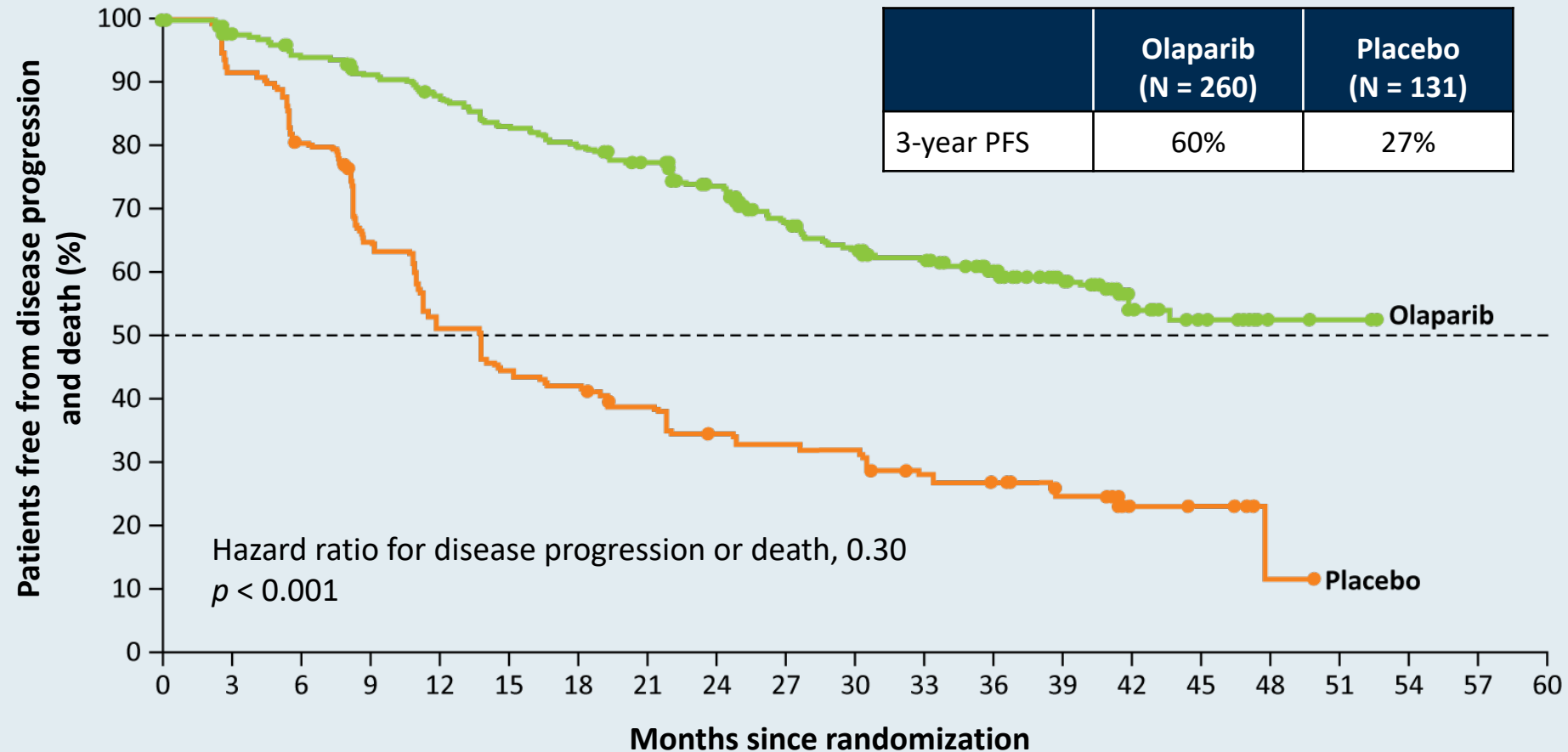
# SOLO-1: A Phase III Trial of Maintenance Olaparib in OC with BRCA Mutation

NCT01844986

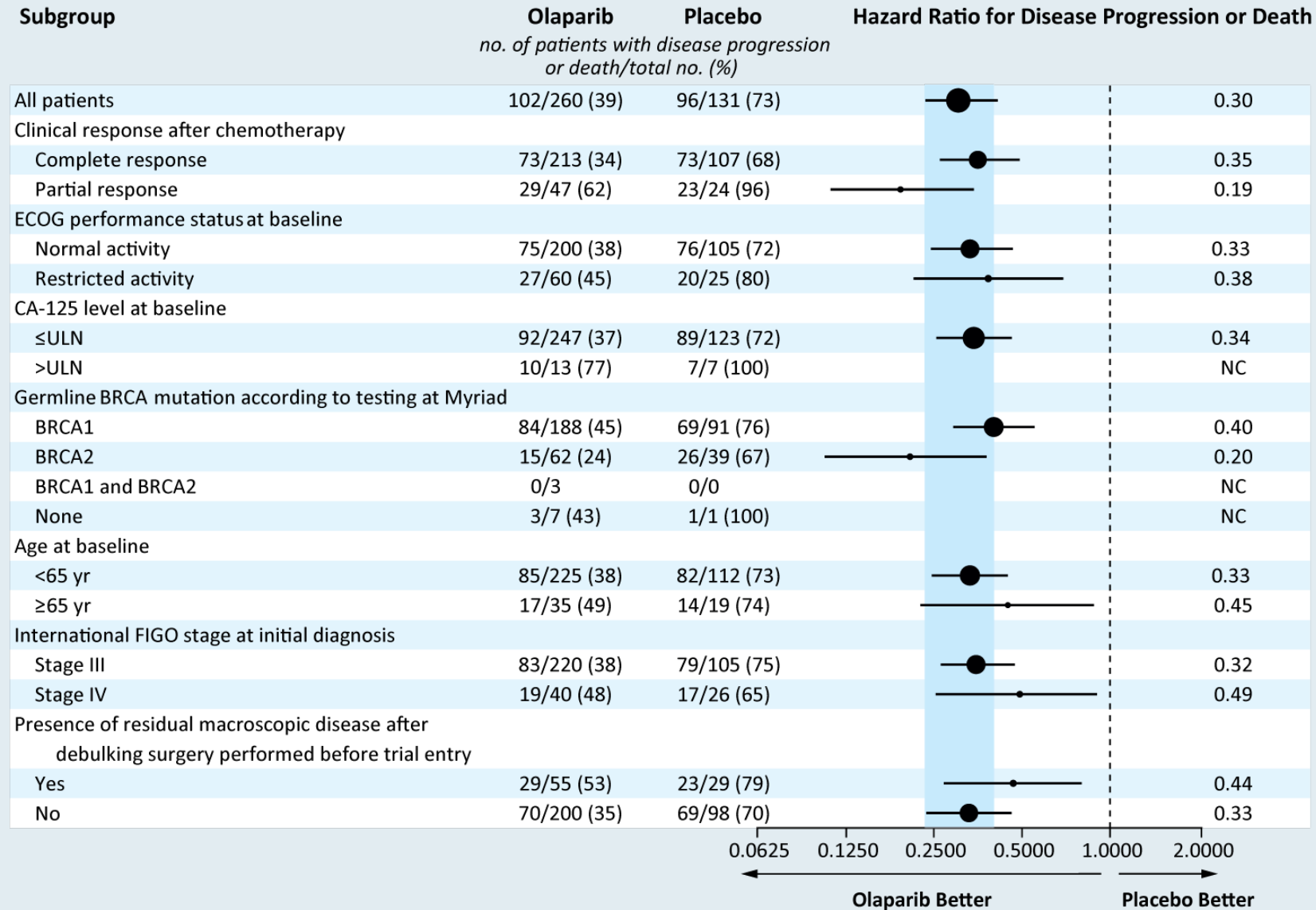


**Primary endpoint:** Investigator-assessed progression-free survival

# SOLO-1: Primary Endpoint Progression-Free Survival (Investigator Assessed)

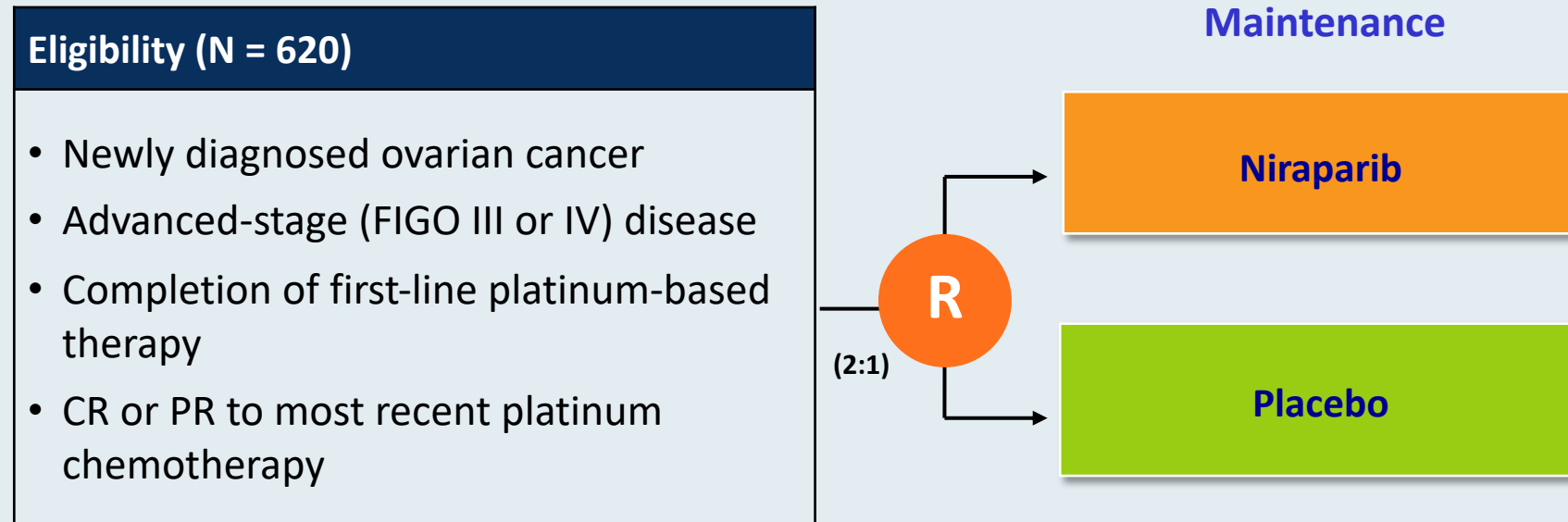


# SOLO-1: PFS Subgroup Analyses



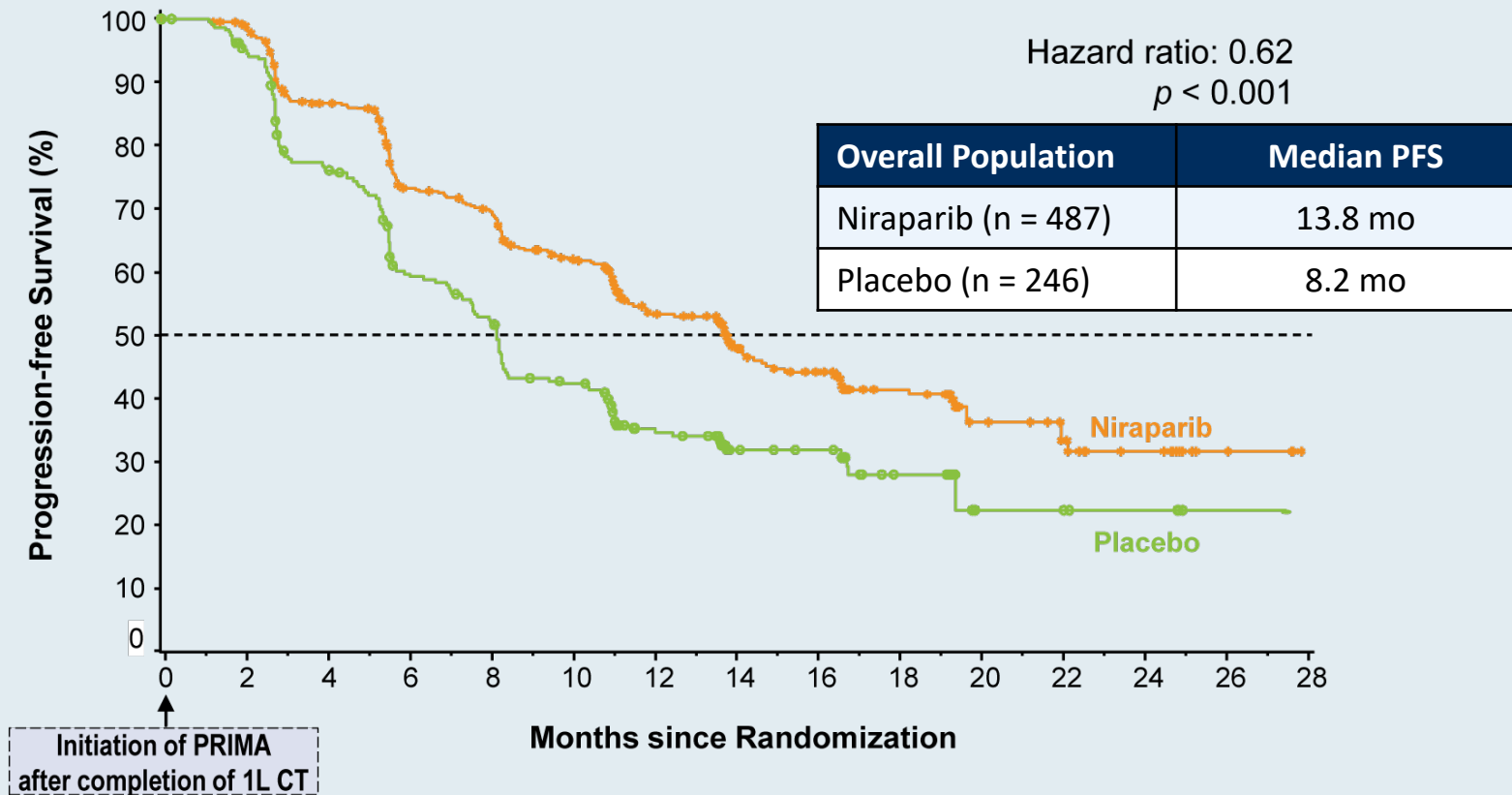


# PRIMA Trial: Maintenance Niraparib for Advanced Ovarian Cancer After Response to Front-Line Platinum-Based Chemotherapy



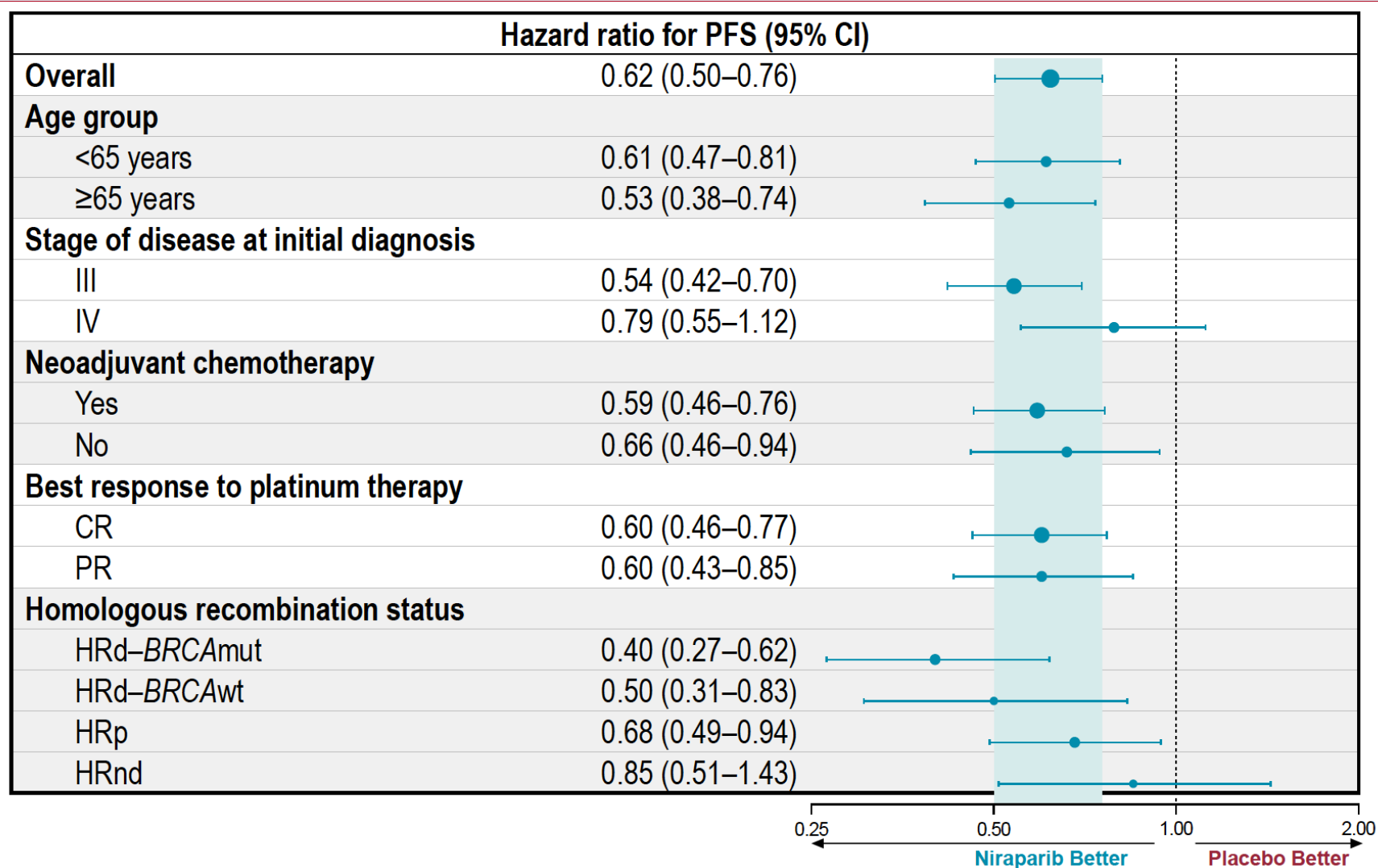
**Primary endpoint: Progression-free survival**

# PRIMA Primary Endpoint: Progression-Free Survival



- Median PFS in the HR-deficient population was 21.9 mo for niraparib and 10.4 mo for placebo (HR 0.43,  $p < 0.001$ ).
- No new safety signals were identified for niraparib.

# PRIMA: Progression-Free Survival Subgroup Analysis



# Efficacy of niraparib therapy in patients with newly diagnosed advanced ovarian cancer by *BRCA* and homologous recombination status: PRIMA/ENGOT-OV26/GOG-3012 study

Monk BJ et al.

SGO 2020; Abstract 31.

**Time to first subsequent therapy (TFST) and progression-free survival 2 (PFS2) from the phase 3 randomized, double-blind PRIMA/ENGOT-OV26/GOG-3012 study in patients with newly diagnosed ovarian cancer**

**Han SN et al.**

**SGO 2020; Abstract 32.**

# **Patient-reported outcomes (PRO) in patients receiving niraparib in the PRIMA/ENGOT-OV26/GOG-3012 trial**

**Pothuri B et al.**

**SGO 2020; Abstract 83.**

# FDA approves olaparib plus bevacizumab as maintenance treatment for ovarian, fallopian tube, or primary peritoneal cancers

Press Release – May 28, 2020

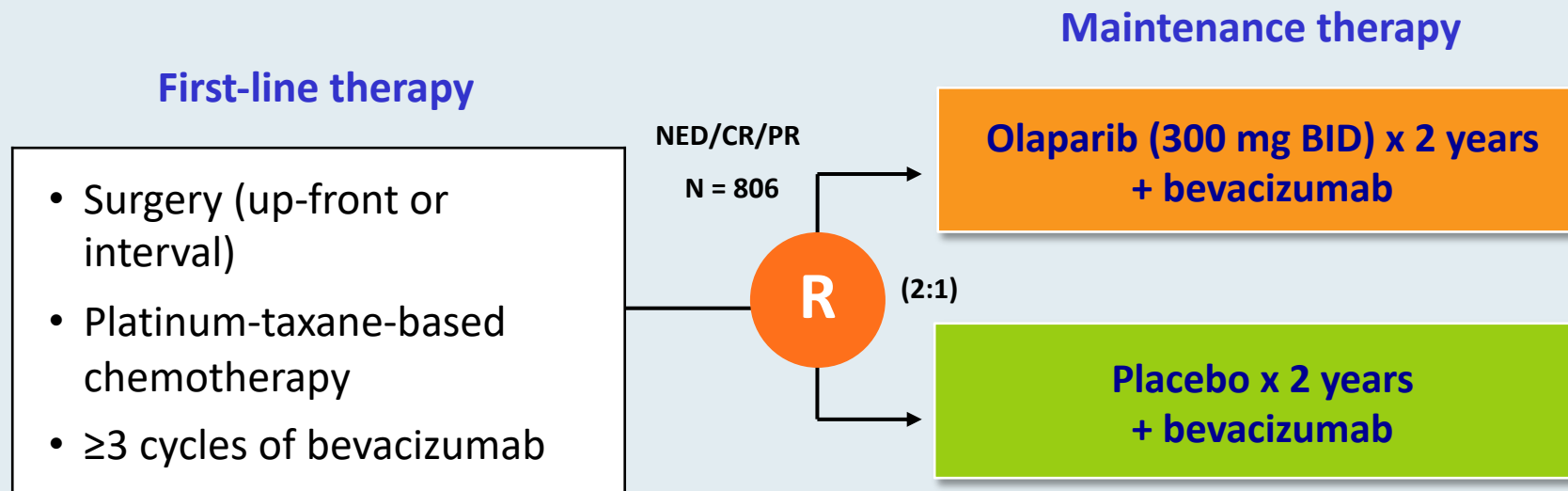
“The Food and Drug Administration expanded the indication of olaparib to include its combination with bevacizumab for first-line maintenance treatment of adult patients with advanced epithelial ovarian, fallopian tube, or primary peritoneal cancer who are in complete or partial response to first-line platinum-based chemotherapy and whose cancer is associated with homologous recombination deficiency positive status defined by either a deleterious or suspected deleterious *BRCA* mutation, and/or genomic instability.

FDA also approved the Myriad myChoice<sup>®</sup> CDx (Myriad Genetic Laboratories, Inc.) as a companion diagnostic for olaparib.

Efficacy of this new indication was investigated in PAOLA-1 (NCT03737643), a randomized, double-blind, placebo-controlled, multi-center trial comparing olaparib with bevacizumab versus placebo plus bevacizumab in patients with advanced high-grade epithelial ovarian cancer, fallopian tube, or primary peritoneal cancer following first-line platinum-based chemotherapy and bevacizumab.”

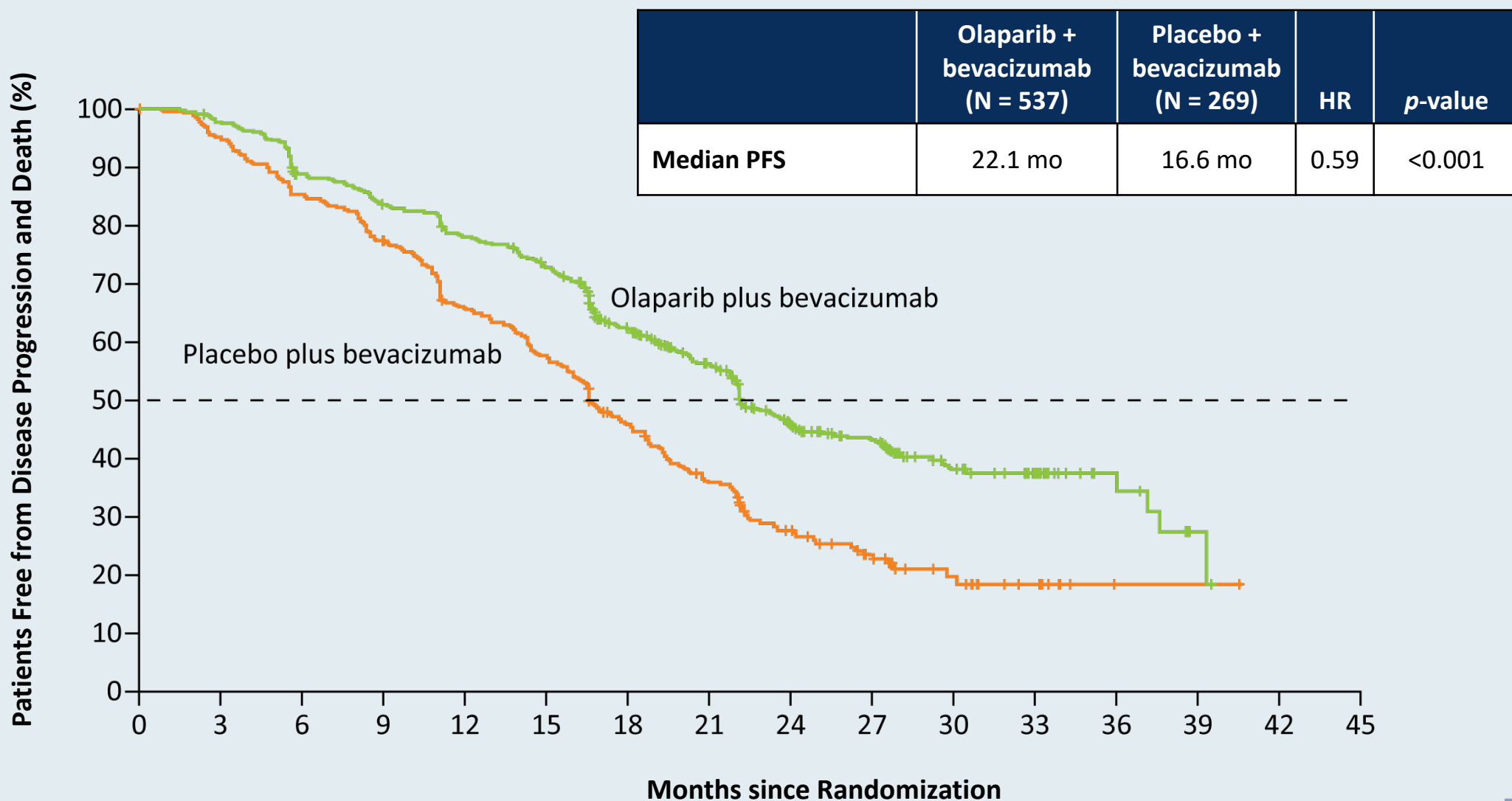
# PAOLA-1 Trial: Maintenance Olaparib with Bevacizumab for Advanced Ovarian Cancer After Response to Front-Line Platinum-Based Chemotherapy and Bevacizumab

Newly diagnosed FIGO Stage III or IV high-grade serous/endometrioid ovarian, fallopian tube or primary peritoneal cancer

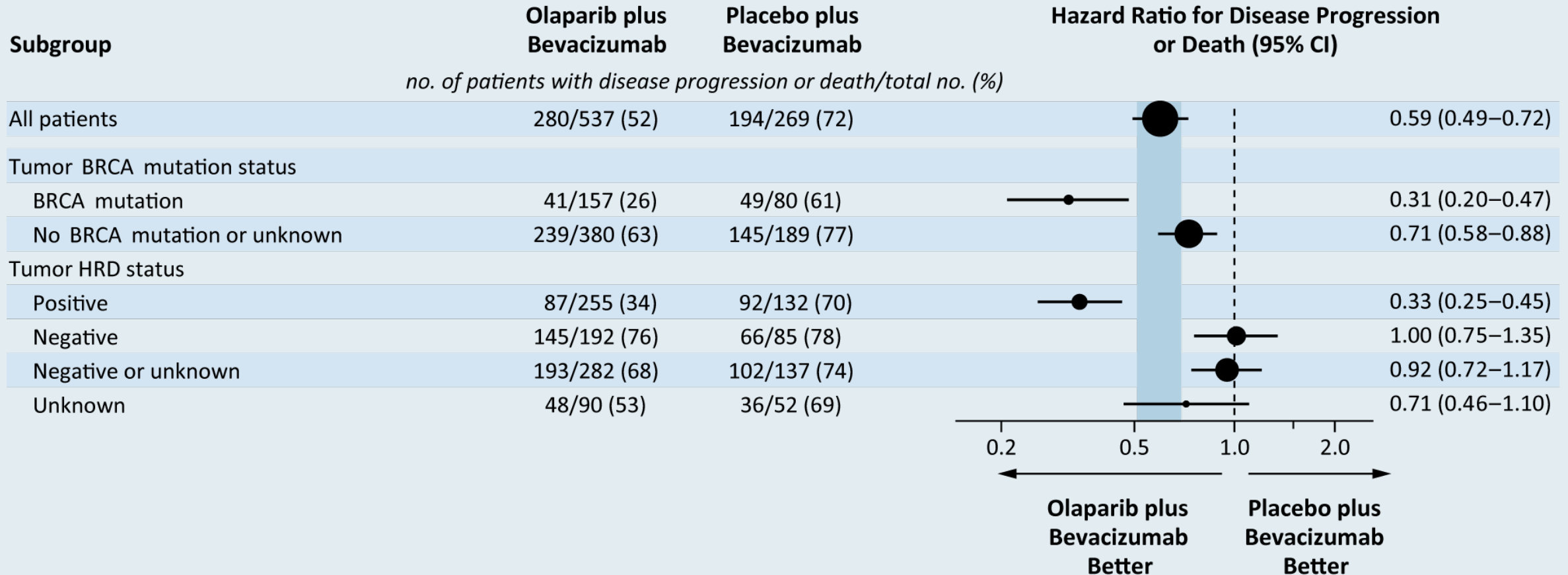




# PAOLA-1: Investigator-Assessed PFS (Primary Endpoint)








# PAOLA-1: Select Subgroup Analysis of PFS



# Ongoing Phase III Clinical Trials of PARP Inhibitors as Maintenance After First-Line Therapy

Trial name (trial identifier)	N	Eligibility	First-line treatment	Maintenance treatment arms
FIRST (NCT03602859)	960	<ul style="list-style-type: none"> <li>BRCA mut or wt</li> <li>Stage III or IV</li> <li>Surgery or inoperable</li> </ul>	<ul style="list-style-type: none"> <li>Platinum-based chemo</li> <li>Platinum-based chemo + TSR-042</li> </ul>	<ul style="list-style-type: none"> <li>Niraparib + TSR-042</li> <li>Niraparib + placebo</li> <li>Placebo + placebo</li> </ul>
ATHENA (NCT03522246)	1,012	<ul style="list-style-type: none"> <li>BRCA mut or wt</li> <li>Stage III or IV</li> <li>Prior surgery</li> </ul>	<ul style="list-style-type: none"> <li>Platinum-based chemo</li> </ul>	<ul style="list-style-type: none"> <li>Rucaparib + nivolumab</li> <li>Rucaparib + placebo</li> <li>Placebo + nivolumab</li> <li>Placebo + placebo</li> </ul>

**In general, what is the optimal approach to mutation testing for possible use of a PARP inhibitor for a patient with newly diagnosed ovarian cancer? Do you routinely assess homologous recombination deficiency (HRD) status in your patients with advanced ovarian cancer?**

		Optimal approach to mutation testing	Routinely assess HRD status?
	DON S DIZON, MD	Germline BRCA; if negative, multigene somatic (eg, NGS)	Yes
	PROFESSOR JONATHAN A LEDERMANN	Multigene germline and somatic/NGS	No
	KATHLEEN MOORE, MD	Multigene germline and somatic/NGS	Yes
	PROFESSOR IGNACE VERGOTE	Germline BRCA; if negative, multigene somatic (eg, NGS)	No
	SHANNON N WESTIN, MD, MPH	Germline BRCA; if negative, multigene somatic (eg, NGS)	Yes

NGS = next-generation sequencing

A 60-year-old woman with Stage IIIC ovarian cancer and a germline BRCA mutation is status post (s/p) optimal debulking surgery with a normal CA-125 level. Regulatory and reimbursement issues aside, what would you recommend as postoperative systemic therapy?



DON S DIZON, MD

Carboplatin/paclitaxel → olaparib



PROFESSOR JONATHAN A  
LEDERMANN

Carboplatin/paclitaxel → olaparib



KATHLEEN MOORE, MD

Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib



PROFESSOR IGNACE VERGOTE

Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib



SHANNON N WESTIN, MD, MPH

Carboplatin/paclitaxel → olaparib or niraparib

A 60-year-old woman with Stage IIIC ovarian cancer (BRCA wild type, HRD-negative) is s/p optimal debulking surgery with a normal CA-125 level. Regulatory and reimbursement issues aside, what would you recommend as postoperative systemic therapy?



DON S DIZON, MD

Carboplatin/paclitaxel → niraparib



PROFESSOR JONATHAN A  
LEDERMANN

Carboplatin/paclitaxel



KATHLEEN MOORE, MD

Carboplatin/paclitaxel + bevacizumab → bevacizumab



PROFESSOR IGNACE VERGOTE

Carboplatin/paclitaxel + bevacizumab → bevacizumab



SHANNON N WESTIN, MD, MPH

Carboplatin/paclitaxel *OR* carboplatin/paclitaxel → niraparib

**A 60-year-old woman with Stage IIIC ovarian cancer and a germline BRCA mutation is s/p suboptimal debulking surgery with an elevated CA-125 level. Regulatory and reimbursement issues aside, what would you recommend as postoperative systemic therapy?**



DON S DIZON, MD

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**



PROFESSOR JONATHAN A  
LEDERMANN

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**



KATHLEEN MOORE, MD

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**



PROFESSOR IGNACE VERGOTE

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**



SHANNON N WESTIN, MD, MPH

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**

**A 60-year-old woman with Stage IIIC ovarian cancer and a somatic BRCA mutation is s/p suboptimal debulking surgery with an elevated CA-125 level. Regulatory and reimbursement issues aside, what would you recommend as postoperative systemic therapy?**



DON S DIZON, MD

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**



PROFESSOR JONATHAN A  
LEDERMANN

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**



KATHLEEN MOORE, MD

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**



PROFESSOR IGNACE VERGOTE

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**








SHANNON N WESTIN, MD, MPH

**Carboplatin/paclitaxel + bevacizumab → bevacizumab + olaparib**



**A 60-year-old woman with Stage IIIC ovarian cancer (BRCA wild type) is s/p suboptimal debulking surgery with an elevated CA-125 level. Regulatory and reimbursement issues aside, what would you recommend as postoperative systemic therapy if her disease was...**

		HRD-positive	HRD-negative
	DON S DIZON, MD	Carbo/pac + bev → bev + olaparib	Carbo/pac + bev → niraparib
	PROFESSOR JONATHAN A LEDERMANN	Carbo/pac + bev → bev + olaparib	Carbo/pac + bev → bev
	KATHLEEN MOORE, MD	Carbo/pac + bev → bev + olaparib	Carbo/pac + bev → bev
	PROFESSOR IGNACE VERGOTE	Carbo/pac + bev → bev + olaparib	Carbo/pac + bev → bev
	SHANNON N WESTIN, MD, MPH	Carbo/pac + bev → bev + olaparib	Carbo/pac + bev → bev

Carbo/pac = carboplatin/paclitaxel; bev = bevacizumab

A 60-year-old woman with Stage IIIC ovarian cancer and a germline BRCA mutation undergoes suboptimal debulking surgery and receives carboplatin/paclitaxel followed by olaparib. For how long would you typically continue the olaparib if the patient is tolerating it well?

	DON S DIZON, MD	Indefinitely
	PROFESSOR JONATHAN A LEDERMANN	2 years
	KATHLEEN MOORE, MD	2 years
	PROFESSOR IGNACE VERGOTE	2 years
	SHANNON N WESTIN, MD, MPH	2 years

A 60-year-old woman with Stage IIIC ovarian cancer (BRCA wild type, HRD-positive) undergoes suboptimal debulking surgery and receives carboplatin/paclitaxel followed by niraparib. For how long would you typically continue the niraparib if the patient is tolerating it well?

	DON S DIZON, MD	Indefinitely
	PROFESSOR JONATHAN A LEDERMANN	3 years
	KATHLEEN MOORE, MD	3 years
	PROFESSOR IGNACE VERGOTE	3 years
	SHANNON N WESTIN, MD, MPH	3 years

**Regulatory and reimbursement issues aside, which starting dose of niraparib would you use for a 125-lb patient with advanced ovarian cancer and a platelet count of 200,000 after a response to front-line platinum-based chemotherapy?**

1. 300 mg daily
2. 200 mg daily
3. 100 mg daily
4. Other

**What starting dose of niraparib would you use for a 125-lb patient with advanced ovarian cancer after response to front-line platinum-based chemotherapy with a platelet count of 200,000 for whom you are about to initiate maintenance niraparib?**



DON S DIZON, MD

**300 mg daily**



PROFESSOR JONATHAN A  
LEDERMANN

**200 mg daily**



KATHLEEN MOORE, MD

**200 mg daily**



PROFESSOR IGNACE VERGOTE

**200 mg daily**



SHANNON N WESTIN, MD, MPH

**200 mg daily**

# Meet The Professor with Dr Dizon

## **MODULE 1: Management of Newly Diagnosed Ovarian Cancer**

- Case presentations
- Key clinical trials
  - SOLO-1, PRIMA, PAOLA

## **MODULE 2: PARP Inhibitors in the Management of Relapsed Disease**

- Case presentations
- Class and agent-specific toxicities; management strategies
- Key clinical trials
  - TOPACIO, MEDIOLA

## Case Presentation – Prof Vergote: A woman with Stage IV ovarian cancer



Professor Ignace Vergote

- Stage IV ovarian cancer, with deep infiltration of the liver and pleural metastases
- Neoadjuvant chemo x 3, with good response
- Plans for interval debulking surgery

### Questions

- If an R0 resection is achieved, should we continue the chemotherapy? Should we administer bevacizumab? A PARP inhibitor?
- If the patient had a BRCA mutation, would you give the PARP inhibitor alone, or would you give bevacizumab and the PARP inhibitor? The same questions apply if the patient was BRCA wild type but had HRD
- What if the patient was BRCA wild type and without HRD — would you give bevacizumab, a PARP inhibitor, or the combination?

**A 58-year-old woman with a BRCA1 germline mutation is started on olaparib, and after 7 cycles she develops Grade 3 anemia. What would be your most likely response?**

1. Continue olaparib
2. Lower the olaparib dose
3. Hold olaparib until hemoglobin increases and restart at the same dose
4. Hold olaparib until hemoglobin increases and restart at a lower dose
5. Switch to another therapy
6. Other



## Case Presentation – Prof Vergote: A 58-year-old woman with Stage IVA ovarian cancer



Professor Ignace Vergote

- Two paternal aunts with breast cancer at age 60; BRCA status uncertain
- Surgical resection of adnexal mass
- MRI whole body diffusion: Stage IVA (supraclavicular node), extensive abdominal disease
- Neoadjuvant paclitaxel/carboplatin weekly + bevacizumab x 15 → interval debulking surgery, with no residual disease
- BRCA1 mutation
- Continued bevacizumab 3-weekly, initiated olaparib 300 mg BID
  - After 7 cycles of olaparib, developed Grade III anemia
  - Dose reduced olaparib to 250 mg BID and anemia resolved to Grade I
  - After 18 cycles of olaparib, she is in complete remission

### Question

- For how long would you treat her?

# Adverse Events: Class Effects and Specific Drug Differences

	Notes	Olaparib	Niraparib	Rucaparib	Talazoparib	Veliparib
Fatigue	50%-70%, mainly Gr1-2	✓	✓	✓	✓	✓
<b>Hematologic AEs</b>						
Anemia	40%-60%	✓	✓	✓	✓	✓ --
Thrombocytopenia	Niraparib dose adjustment, based on platelet counts	✓	✓ ++	✓	✓	✓
Neutropenia	~20%	✓	✓	✓	✓	✓
<b>Gastrointestinal AEs</b>						
Nausea/vomiting	Moderately emetic >30%	✓	✓	✓	✓	✓
Diarrhea	~33%	✓	✓	✓	✓	✓
<b>Laboratory abnormalities</b>						
ALT/AST elevation	5%-10% olaparib, niraparib; 34% rucaparib	✓ --	✓ --	✓ ++	✓ ++	?
Creatinine elevation	10%-12%	✓	✓	✓	NR	NR

NR = not reported

Olaparib PI, rev 5/2020; Niraparib PI, rev 4/2020; Rucaparib PI, rev 5/2020; Talazoparib PI, rev 3/2020;

Madariaga A et al. *Int J Gyn Cancer* 2020 April 9;[Online ahead of print]; Litton JK et al. *NEJM* 2018;379:753-63.

# Adverse Events: Class Effects and Specific Drug Differences

	Notes	Olaparib	Niraparib	Rucaparib	Talazoparib	Veliparib
<b>Respiratory disorders</b>						
Dyspnea +/- cough	10%-20%, usually Gr 1-2	✓	✓	✓	✓	NR
Nasopharyngitis	~10%	✓	✓	✓	✓	NR
<b>Nervous system and psychiatric disorders</b>						
Insomnia/headache	10%-25%, usually Gr 1-2	✓	✓	✓	✓	✓
<b>Dermatologic toxicity</b>						
Rash, photosensitivity		<1%	✓	✓++	NR	NR
<b>Cardiovascular toxicity</b>						
Hypertension, tachycardia, palpitation		1%	✓++	NR	NR	NR
<b>Rare AEs</b>						
MDS/AML	~1% of pts	✓	✓	✓	✓	✓

NR = not reported

Olaparib PI, rev 5/2020; Niraparib PI, rev 4/2020; Rucaparib PI, rev 5/2020; Talazoparib PI, rev 3/2020;  
 Madariaga A et al. *Int J Gyn Cancer* 2020 April 9;[Online ahead of print]; Litton JK et al. *NEJM* 2018;379:753-63.

## Dose Adjustments for Adverse Events

Olaparib dose reductions	Dose (tablet)
Starting dose	• 300 mg BID
First dose reduction	• 250 mg BID
Second dose reduction	• 200 mg BID

Niraparib dose reductions	Dose
Starting dose	• 300 mg daily
First dose reduction	• 200 mg daily
Second dose reduction	• 100 mg daily

Rucaparib dose reductions	Dose
Starting dose	• 600 mg twice daily
First dose reduction	• 500 mg twice daily
Second dose reduction	• 400 mg twice daily
Third dose reduction	• 300 mg twice daily

# Recent Relevant Data Sets

# Determinants of Platinum Sensitivity and Resistance

- Distribution of platinum in the tumor cell
- Cellular metabolism of platinum agents
- Expression levels of epithelial-mesenchymal transition (EMT)-related transcription factors
- PARP1 expression level
- BRCA1/2 mutational status
- Hyperexpression or polymorphism of ERCC1
- Mutational status of homologous recombination (HR) pathway genes

# FDA-Approved PARP Inhibitors as Maintenance Therapy for Recurrent, Platinum-Sensitive Disease

## Niraparib

### Indications:

- Maintenance following response to platinum-based therapy
- Irrespective of BRCA status

Pivotal study: ENGOT-OV16/NOVA

Approved: 3/2017

## Rucaparib

### Indications:

- Maintenance following response to platinum-based therapy
- Irrespective of BRCA status

Pivotal study: ARIEL3

Approved: 4/2018

## Olaparib

### Indications:

- Maintenance following response to platinum-based therapy
- Irrespective of BRCA status

Pivotal studies: SOLO-2, Study 19

Approved: 8/2017

Niraparib FDA insert, revised 3/2017; Rucaparib FDA insert, revised 4/2018; Olaparib FDA insert, revised 1/2018; Pujade-Lauraine E et al. *Lancet* 2017;18(9):1274-84; Mirza MR et al. *N Engl J Med* 2016;375(22):2154-64; Coleman RL et al. *Lancet* 2017;390(10106):1949-61; Ledermann J et al. *N Engl J Med* 2012;366:1382-92.

# Eligibility and Dosing in Pivotal Studies of PARP Inhibitors for Recurrent, Platinum-Sensitive OC

	<b>NOVA<sup>1</sup> (Niraparib)</b>	<b>SOLO-2<sup>2</sup> (Olaparib)</b>	<b>ARIEL3<sup>3</sup> (Rucaparib)</b>
<b>BRCA status</b>	With or without gBRCA mutation	gBRCA mutation (Study 19: +/- gBRCA mutation)	With or without gBRCA mutation
<b>HRD testing</b>	Yes	No	Yes
<b>Tumor assessment schedule</b>	Every 8 wk to C14 → every 12 wk	Every 12 wk until wk 72 → every 24 wk	Every 8 wk to C14 → every 12 wk
<b>Dosing/formulation</b>	300 mg qd	300 mg BID	600 mg BID
<b>No. of prior lines of chemo</b>	2 or more	2 or more	2 or more

<sup>1</sup> Mirza MR et al. *N Engl J Med* 2016;375(22):2154-64; <sup>2</sup> Pujade-Lauraine E et al. *Lancet* 2017;18(9):1274-84; <sup>3</sup> Coleman RL et al. *Lancet* 2017;390(10106):1949-61.



# Efficacy Summary of PARP Inhibitors for Recurrent, Platinum-Sensitive OC

	PARPi	Control	HR
<b>NOVA<sup>1</sup> — Niraparib</b>			
gBRCA mutation	21.0 mo	5.5 mo	0.27
No gBRCA mutation, HRD+	12.9 mo	3.8 mo	0.38
No gBRCA mutation	9.3 mo	3.9 mo	0.45
<b>SOLO-2<sup>2</sup> — Olaparib</b>			
gBRCA mutation	19.1 mo	5.5 mo	0.30
<b>ARIEL3<sup>3-4</sup> — Rucaparib</b>			
ITT (All comers)	10.8 mo	5.4 mo	0.36
g or sBRCA mutation	16.6 mo	5.4 mo	0.23
HRD+	13.6 mo	5.4 mo	0.32
BRCA <sup>WT</sup> /High LOH	13.6 mo	5.4 mo	0.32
BRCA <sup>WT</sup> /Low LOH	6.7 mo	5.4 mo	0.58

<sup>1</sup> Mirza MR et al. *N Engl J Med* 2016;375(22):2154-64; <sup>2</sup> Pujade-Lauraine E et al. *Lancet* 2017;18(9):1274-84; <sup>3</sup> Coleman RL et al. *Lancet* 2017;390(10106):1949-61; <sup>4</sup> Ledermann JA et al. *Lancet Oncol* 2020;21(5):710-722.

# FDA-Approved PARP Inhibitors as Monotherapy for Multiply Relapsed Disease

Olaparib	Rucaparib	Niraparib
<p><b>Indications:</b></p> <ul style="list-style-type: none"><li>• 4th-line therapy and beyond</li><li>• Germline BRCA mutation</li></ul> <p><b>Dosing:</b></p> <ul style="list-style-type: none"><li>• 300 mg BID</li></ul> <p><b>Approved: 12/2014</b></p>	<p><b>Indications:</b></p> <ul style="list-style-type: none"><li>• 3rd-line therapy and beyond</li><li>• Germline <u>and/or</u> somatic BRCA mutation</li></ul> <p><b>Dosing:</b></p> <ul style="list-style-type: none"><li>• 600 mg BID</li></ul> <p><b>Approved: 12/2016</b></p>	<p><b>Indications:</b></p> <ul style="list-style-type: none"><li>• 4th-line therapy and beyond</li><li>• HRD-positive</li></ul> <p><b>Dosing:</b></p> <ul style="list-style-type: none"><li>• Weight- and platelet count-dependent: 200 or 300 mg QD</li></ul> <p><b>Approved: 102/2019</b></p>

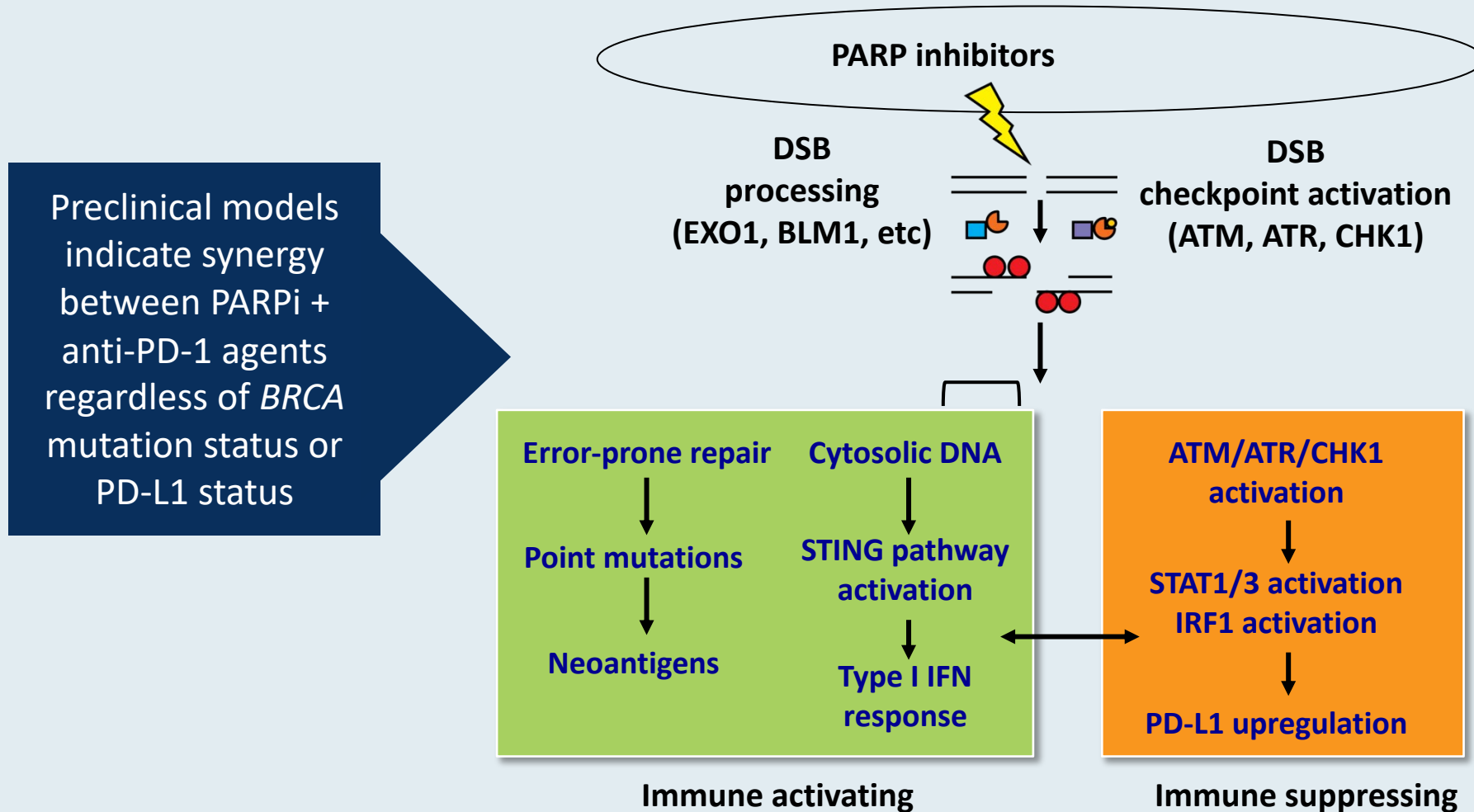
# Efficacy Summary of PARP Inhibitors for Multiply Relapsed OC

	Objective Response Rate
<b>QUADRA<sup>1</sup> — Niraparib</b>	
HRD-positive	29/189 (15%)
HRD-negative/unknown	8/230 (3%)
BRCA-mutated	18/63 (29%)
<b>SOLO-3<sup>2</sup> — Olaparib</b>	
gBRCA-mutation	109/151 (72%)
<b>ARIEL2<sup>3-4</sup> — Rucaparib</b>	
g or sBRCA mutation	57/106 (54%)

<sup>1</sup> Moore KN et al. *Lancet Oncol* 2019;20(5):636-648; <sup>2</sup> Penson RT et al. ASCO 2019;Abstract 5506;

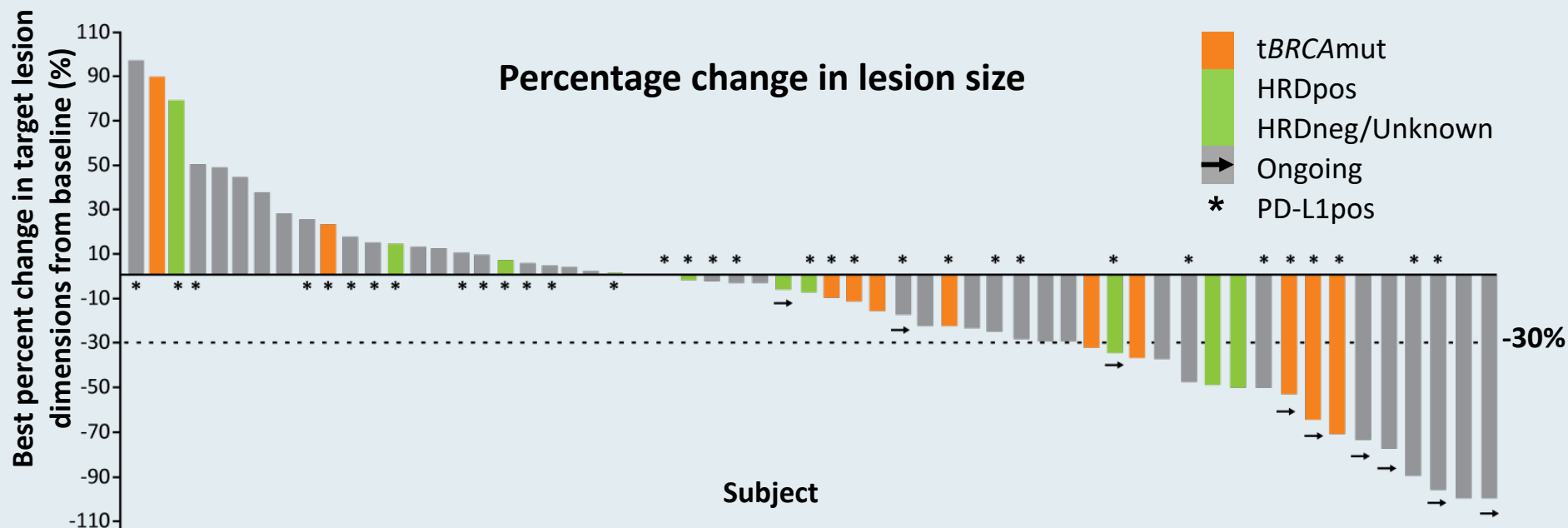
<sup>3</sup> Oza AM et al. *Gynecol Oncol* 2017;147:267-75.

# Biologic Rationale for the Combination of a PARP Inhibitor with an Immune Checkpoint Inhibitor



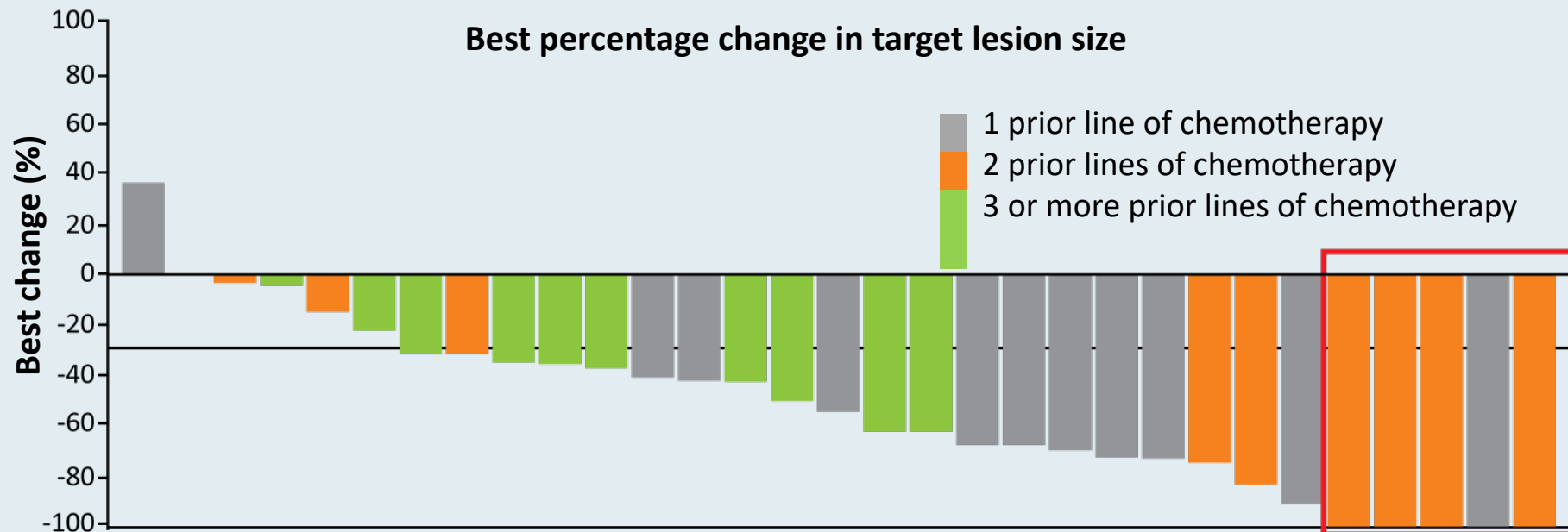
Preclinical data demonstrate synergy with PARPi and anti-PD-1 combinations.

# TOPACIO (KEYNOTE-162): A Phase I/II Study of Niraparib with Pembrolizumab in Recurrent, Platinum-Resistant OC



Response	All patients	tBRCAmut	HRD-pos	tBRCAwt	HRD-neg
ORR	11/47 (23%)	2/8 (25%)	4/16 (25%)	9/37 (24%)	7/26 (27%)
DCR	30/47 (64%)	5/8 (63%)	11/16 (69%)	24/37 (65%)	15/26 (58%)

# MEDIOLA: A Phase I/II Study of Olaparib and Durvalumab in Recurrent, Platinum-Sensitive OC with gBRCA Mutation



	Second line	Third line	Fourth line	All lines
ORR	10/13 (77%)	6/9 (67%)	7/10 (70%)	23/32 (72%)

# OReO/ENGOT Ov-38: A Phase IIIb Trial of Olaparib Maintenance Retreatment in Patients with EOC Previously Treated with a PARP Inhibitor and Responding to Repeat Platinum Chemotherapy

NCT03106987



**Primary endpoint:** Investigator-assessed progression-free survival

## Select Ongoing or Planned Phase III Trials of PARP Inhibitors in Combination Therapy

Trial name (Trial identifier)	N	Setting	Treatment arms
ATHENA (NCT03522246)	1,012	Maintenance therapy after 1L platinum-based chemo	<ul style="list-style-type: none"> <li>• <b>Rucaparib</b> + Nivolumab</li> <li>• <b>Rucaparib</b> + Placebo</li> <li>• Nivolumab + Placebo</li> <li>• Placebo</li> </ul>
DUO-O (NCT03737643)	1,056	Maintenance therapy after 1L platinum-based chemo/Bev ± Durvalumab	<ul style="list-style-type: none"> <li>• Bev</li> <li>• Bev + Durvalumab</li> <li>• Bev + Durvalumab + <b>Olaparib</b></li> </ul>
NRG-GY004 (NCT02446600)	549	Recurrent, platinum-sensitive	<ul style="list-style-type: none"> <li>• Platinum-based chemo</li> <li>• <b>Olaparib</b></li> <li>• <b>Olaparib</b> + Cediranib</li> </ul>
ANITA (NCT03598270)	414	Recurrent, platinum-sensitive	<ul style="list-style-type: none"> <li>• Placebo + Platinum-based chemo → <b>Niraparib</b></li> <li>• ATEZO + Platinum-based chemo → <b>Niraparib</b> + ATEZO</li> </ul>

Bev = bevacizumab; ATEZO = atezolizumab



A woman in her mid-60s with recurrent high-grade serous ovarian cancer begins rucaparib monotherapy (600 mg BID). Within a few weeks her serum creatinine increases from 0.86 mg/dL to 1.6 mg/dL. What would be the optimal management approach?



DON S DIZON, MD

**Hold rucaparib until creatinine returns to normal, then restart at reduced dose**



PROFESSOR JONATHAN A  
LEDERMANN

**Hold rucaparib until creatinine returns to normal, then restart at the same dose**



KATHLEEN MOORE, MD

**Continue rucaparib at the same dose**



PROFESSOR IGNACE VERGOTE






**Hold rucaparib until creatinine returns to normal, then restart at the same dose**



SHANNON N WESTIN, MD, MPH

**Continue rucaparib at the same dose**

**In general, what is your approach to antiemetic therapy for a patient with ovarian cancer who is starting treatment on a PARP inhibitor? Does your approach to antiemetic therapy differ according to which PARP inhibitor is administered?**

		Antiemetic approach	Differ by PARPi?
	DON S DIZON, MD	Prophylactic antiemetic prior to PARPi	No
	PROFESSOR JONATHAN A LEDERMANN	Recommend antiemetic if pt has nausea	No
	KATHLEEN MOORE, MD	Prophylactic antiemetic prior to PARPi for the first 2 months	No
	PROFESSOR IGNACE VERGOTE	Recommend antiemetic if pt has nausea	No
	SHANNON N WESTIN, MD, MPH	Recommend antiemetic if pt has nausea	No

For a patient with Stage IIIC ovarian cancer and a germline BRCA mutation who has undergone optimal debulking surgery followed by chemotherapy and 2 years of PARP inhibitor maintenance therapy, do you believe the risk of developing MDS (myelodysplastic syndromes) or AML (acute myeloid leukemia) is increased by the PARP inhibitor?



DON S DIZON, MD

**Yes (Incidence in SOLO-1 was 1%, in SOLO-2 was 16%)**



PROFESSOR JONATHAN A  
LEDERMANN

**Yes, by 1%**



KATHLEEN MOORE, MD

**Yes, by 2%**



PROFESSOR IGNACE VERGOTE

**Yes, by 1%**



SHANNON N WESTIN, MD, MPH

**Yes, by 1%**

According to your clinical experience, do PARP inhibitors cause insomnia?



DON S DIZON, MD

No



PROFESSOR JONATHAN A  
LEDERMANN

Yes



KATHLEEN MOORE, MD

Yes



PROFESSOR IGNACE VERGOTE






No



SHANNON N WESTIN, MD, MPH

Yes

**A 70-year-old woman with advanced ovarian cancer and a germline BRCA mutation undergoes debulking surgery followed by chemotherapy with carboplatin/paclitaxel and experiences disease relapse 1 year later. Which treatment would you likely recommend?**

 DON S DIZON, MD	<b>Carbo/pac → maintenance olaparib</b>
 PROFESSOR JONATHAN A LEDERMANN	<b>Carbo/PLD → maintenance olaparib</b>
 KATHLEEN MOORE, MD	<b>Platinum doublet → maintenance olaparib</b>
 PROFESSOR IGNACE VERGOTE	<b>Platinum doublet → maintenance olaparib</b>
 SHANNON N WESTIN, MD, MPH	<b>Carbo/pac + bevacizumab → maintenance olaparib</b>

PLD = pegylated liposomal doxorubicin

A 70-year-old woman with advanced ovarian cancer (BRCA wild type, HRD-negative) undergoes debulking surgery followed by chemotherapy with carboplatin/paclitaxel and experiences disease relapse 1 year later. Which treatment would you likely recommend?



DON S DIZON, MD

**Carboplatin/paclitaxel → maintenance niraparib**



PROFESSOR JONATHAN A  
LEDERMANN

**Carboplatin/PLD → maintenance rucaparib**



KATHLEEN MOORE, MD

**Platinum doublet + bevacizumab → maintenance bevacizumab**



PROFESSOR IGNACE VERGOTE






**Platinum doublet + bevacizumab → maintenance bevacizumab**



SHANNON N WESTIN, MD, MPH

**Carbo/PLD + bevacizumab → maintenance bevacizumab**

**A 70-year-old woman with advanced ovarian cancer and a germline BRCA mutation undergoes debulking surgery, then receives carboplatin/paclitaxel/bevacizumab followed by maintenance therapy with a PARP inhibitor for 2 years and experiences disease relapse 1 year later. Which treatment would you likely recommend?**

 DON S DIZON, MD	<b>Carboplatin/paclitaxel → maintenance w/ alternate PARPi than received</b>
 PROFESSOR JONATHAN A LEDERMANN	<b>Carboplatin/PLD</b>
 KATHLEEN MOORE, MD	<b>Platinum doublet → maintenance niraparib</b>
 PROFESSOR IGNACE VERGOTE	<b>Platinum doublet + bev → maintenance bev + PARPi</b>
 SHANNON N WESTIN, MD, MPH	<b>Carboplatin/PLD → maintenance olaparib</b>

PARPi = PARP inhibitor

A 70-year-old woman with advanced ovarian cancer (BRCA wild type, HRD-negative) undergoes debulking surgery, then receives carboplatin/paclitaxel/bevacizumab followed by maintenance therapy with a PARP inhibitor for 2 years and experiences disease relapse 1 year later. Which treatment would you likely recommend?



DON S. DIZON, MD

**Carboplatin/paclitaxel**



PROFESSOR JONATHAN A  
LEDERMANN

**Carboplatin/PLD + bevacizumab → maintenance bevacizumab**



KATHLEEN MOORE, MD

**Platinum doublet + bevacizumab → maintenance bevacizumab**



PROFESSOR IGNACE VERGOTE

**Platinum doublet**



SHANNON N. WESTIN, MD, MPH

**Carboplatin/PLD + bevacizumab → maintenance bevacizumab**



A 70-year-old woman with advanced ovarian cancer (BRCA wild type, HRD-positive) undergoes debulking surgery, then receives carboplatin/paclitaxel/bevacizumab followed by maintenance therapy with a PARP inhibitor for 2 years and experiences disease relapse 1 year later. Which treatment would you likely recommend?



DON S DIZON, MD

Carboplatin/paclitaxel → maintenance w/ alternate PARPi than received



PROFESSOR JONATHAN A  
LEDERMANN

Carboplatin/PLD



KATHLEEN MOORE, MD

Platinum doublet → maintenance olaparib



PROFESSOR IGNACE VERGOTE

Platinum doublet → maintenance olaparib



SHANNON N WESTIN, MD, MPH

Carbo/pac → maintenance niraparib *OR* Carbo/PLD → maintenance niraparib

Outside of a clinical trial, have you used or would you use a second PARP inhibitor or continue the same PARP inhibitor for a patient with ovarian cancer who experienced disease progression on a PARP inhibitor?



DON S DIZON, MD

I have



PROFESSOR JONATHAN A LEDERMANN

I have



KATHLEEN MOORE, MD

I have



PROFESSOR IGNACE VERGOTE

I have



SHANNON N WESTIN, MD, MPH

I have

# Optimizing the Selection and Sequencing of Therapy for Patients with Chronic Lymphocytic Leukemia

*A Meet The Professor Series*

**Friday, August 21, 2020**

**12:00 PM – 1:00 PM ET**

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**Faculty**

**Brad S Kahl, MD**

**Moderator**

**Neil Love, MD**

***Thank you for joining us!***

***CME and MOC credit information will be  
emailed to each participant within 5 days.***