Patient and Physician Perspectives on Administration of the PCSK9 Monoclonal Antibody Alirocumab, an Injectable Medication to Lower LDL-C Levels

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This study was funded by Sanofi and Regeneron Pharmaceuticals

Industry Relationships and Institutional Affiliations

Author	Disclosure
Bertrand Cariou	Has received research funds from Sanofi and has received fees from consulting and/or advisory boards from Amgen, AstraZeneca, DebioPharm, Janssen, Eli Lilly, Genfit, Novo-Nordisk, Regeneron and Sanofi.
Maja Bujas-Bobanovic	Employee of and stockholder in Sanofi.
Michael Louie	Employee of and stockholder in Regeneron.
Eli Roth	Employed by a company that has received research funds and fees for consulting from Regeneron, Sanofi, and Amgen, and for speaker's bureau from Merck and AstraZeneca.

Background

- Alirocumab is a fully human monoclonal antibody which binds to and inhibits proprotein convertase subtilisin/kexin type 9 (PCSK9)
  - Alirocumab (monotherapy or with background statin ± other lipid-lowering therapies) reduced LDL-C by 47.2–61.0% from baseline after 24 weeks of treatment in Phase 3 trials[1-4]
- Alirocumab 75 mg and 150 mg doses are each administered via 1 mL subcutaneous injection
- However, many patients requiring lipid-lowering therapy will not have experience with injectable medications

1. Roth EM et al. Int J Cardiol. 2014;176:55–61.
2. Cannon CP et al. Eur Heart J. 2015;36:1186-1194.
3. Robinson JG et al. N Eng J Med. 2015; 72:1489-1499.
4. Kereiakes DJ et al. Am Heart J 2015. [Epub ahead of print]

Aims

- Two delivery devices have been used in alirocumab clinical trials
  - Pre-filled syringe
  - Pre-filled pen

This study was designed to assess patient and physician perceptions of the usability and acceptance of these devices

- 400 participants (200 physicians and 200 patients) from US, France, UK, Germany, Italy, Spain
- Data collected via self-administered questionnaire

Physicians

Physicians (N=200)	
Primary Care Physicians (PCPs)	99
Specialists (Cardiologists, Endocrinologists, Diabetologists, Lipidologists, Nephrologists [Germany only], Chemical pathologists [UK only])	101
Mean practice experience	17.8 yrs since residency
Average number of hypercholesterolemic patients	797
% patients receiving LLT	76.7%

- **None of the physicians were investigators in alirocumab trials**

LLT, lipid-lowering therapy.

Patients

- **Patients were not at their LDL-C goal and had at least one of the following:**
  - **Familial hypercholesterolemia**
  - **Statin intolerance***
  - **High cardiovascular (CV) risk****
  - **Diabetes**

Patients (N=200)	
Mean age	59.5 yrs
% Females	52%
% With experience of injectable medication (any medication)	25.5%

*Discontinued two or more statins due to muscle related side effects. Not currently receiving high dose statins. Not diagnosed with FH.
**Diagnosed with or experienced at least one CV event OR diagnosed with diabetes and at least 2 additional CV risk factors. Not diagnosed with FH or statin intolerant.

Study Structure

Introduction to drug*

↓

Participant asked about willingness to prescribe/inject before testing

↓

Device demonstration and testing

- Each participant saw only one of the devices (pen or syringe)
- Two blinded doses of alirocumab placebo** (75 and 150 mg) were tested by injecting into a prosthetic pad
- Assessed participant agreement with statements about device usability after each dose

↓

Participant asked about willingness to prescribe/inject after testing

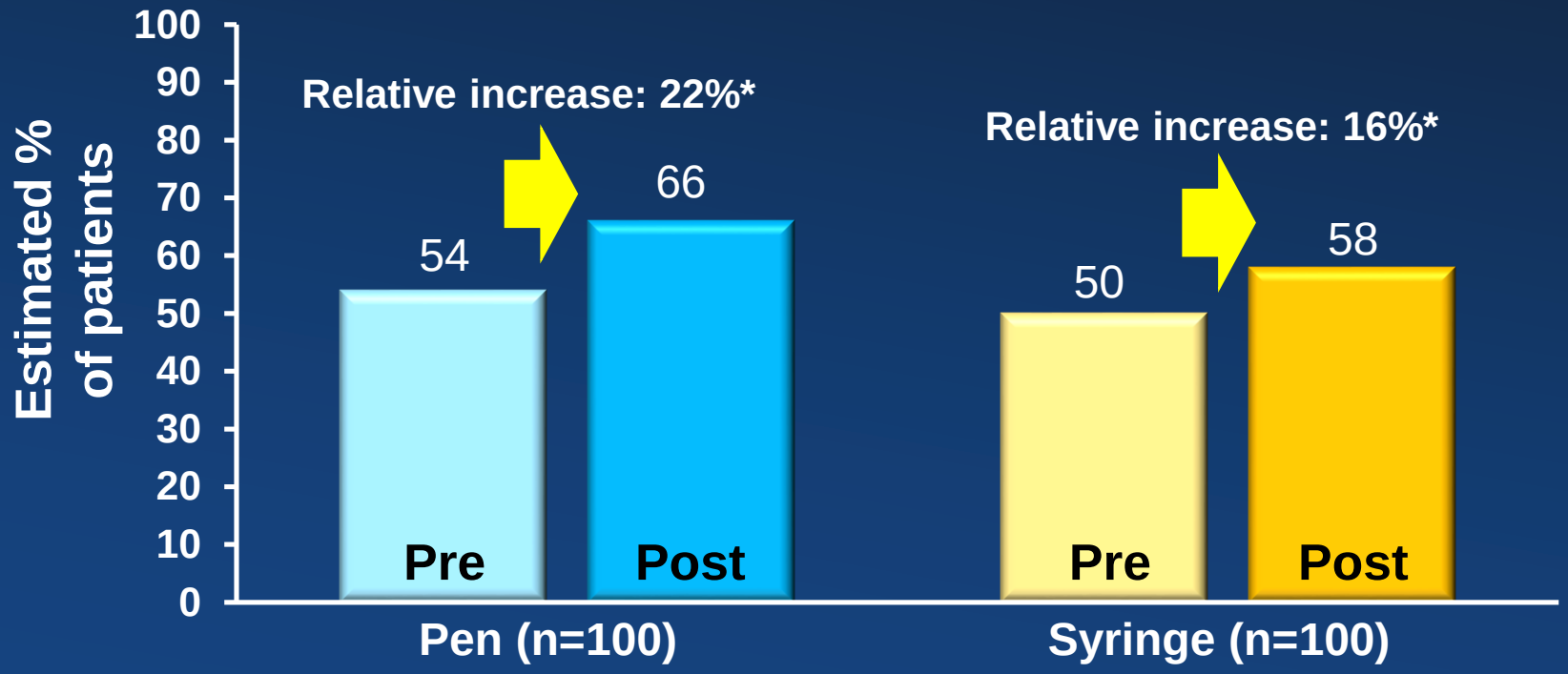
*Alirocumab identity was blinded, with an unbranded name (‘Voypaz’) used instead.
**Placebo was developed to mimic consistency and viscosity of active dose. Both doses used a 1 mL injection volume. Doses were tested in a randomly determined order.

Responses to Usability Statements

- After testing, participants responded to a list of statements about ease of use of the devices
- Overall, positive responses related to usability
- The majority of participants (83–100%) agreed with the statements
- Example statements included:
  - *The injection is easy for patients to learn*
  - *I would recommend the pen to my patients*
  - *The pen is convenient to use, which can make it easy for you to stay with your treatment*
  - *Visual and audio cues confirm when the injection begins and the injection is completed*

Physician Estimates of Patient Willingness to Self-Inject (Pre- and Post-Testing)

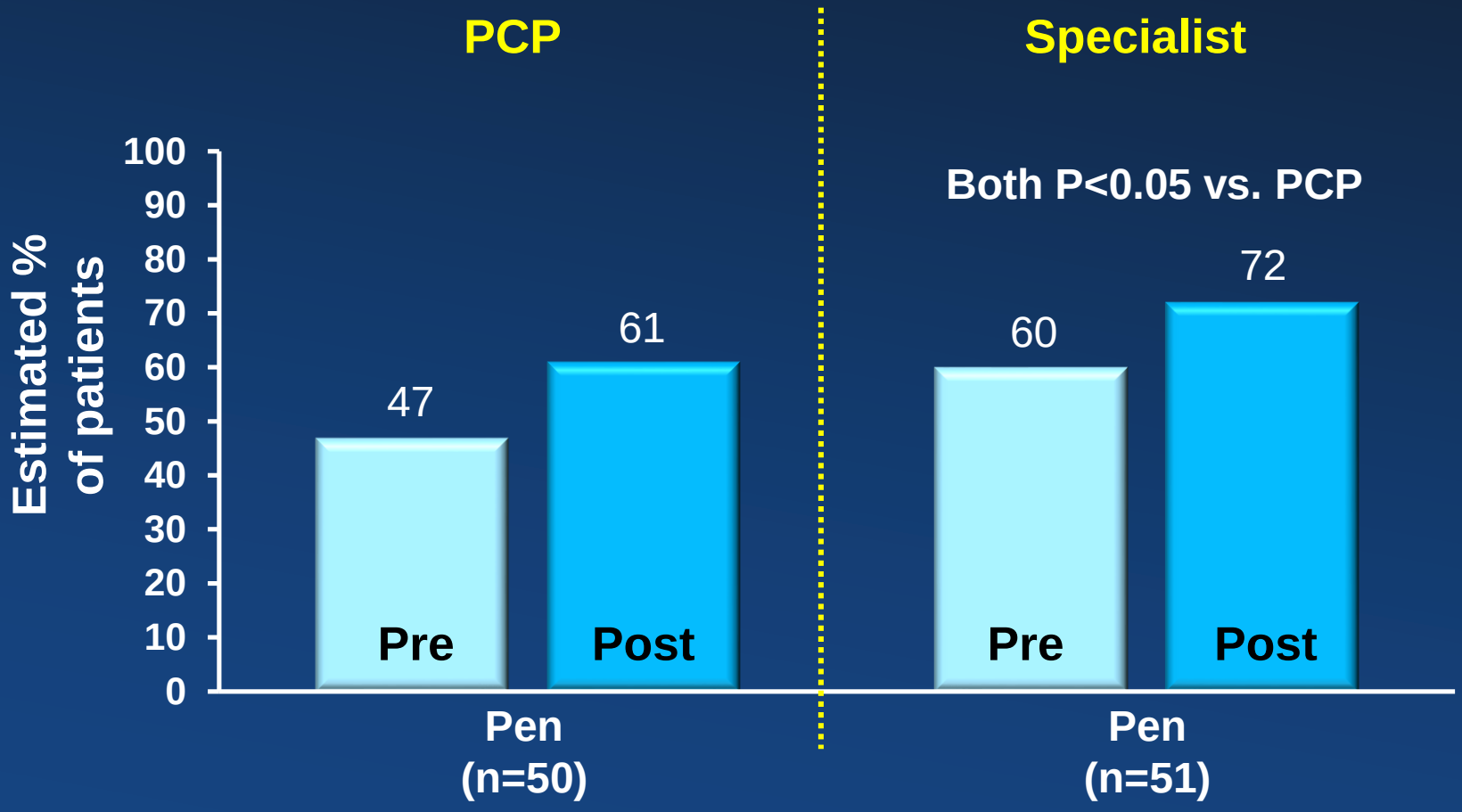
- After testing, physician estimates of the % of their patients who would be willing to self-inject with the devices increased



*P<0.05, after testing vs. before testing

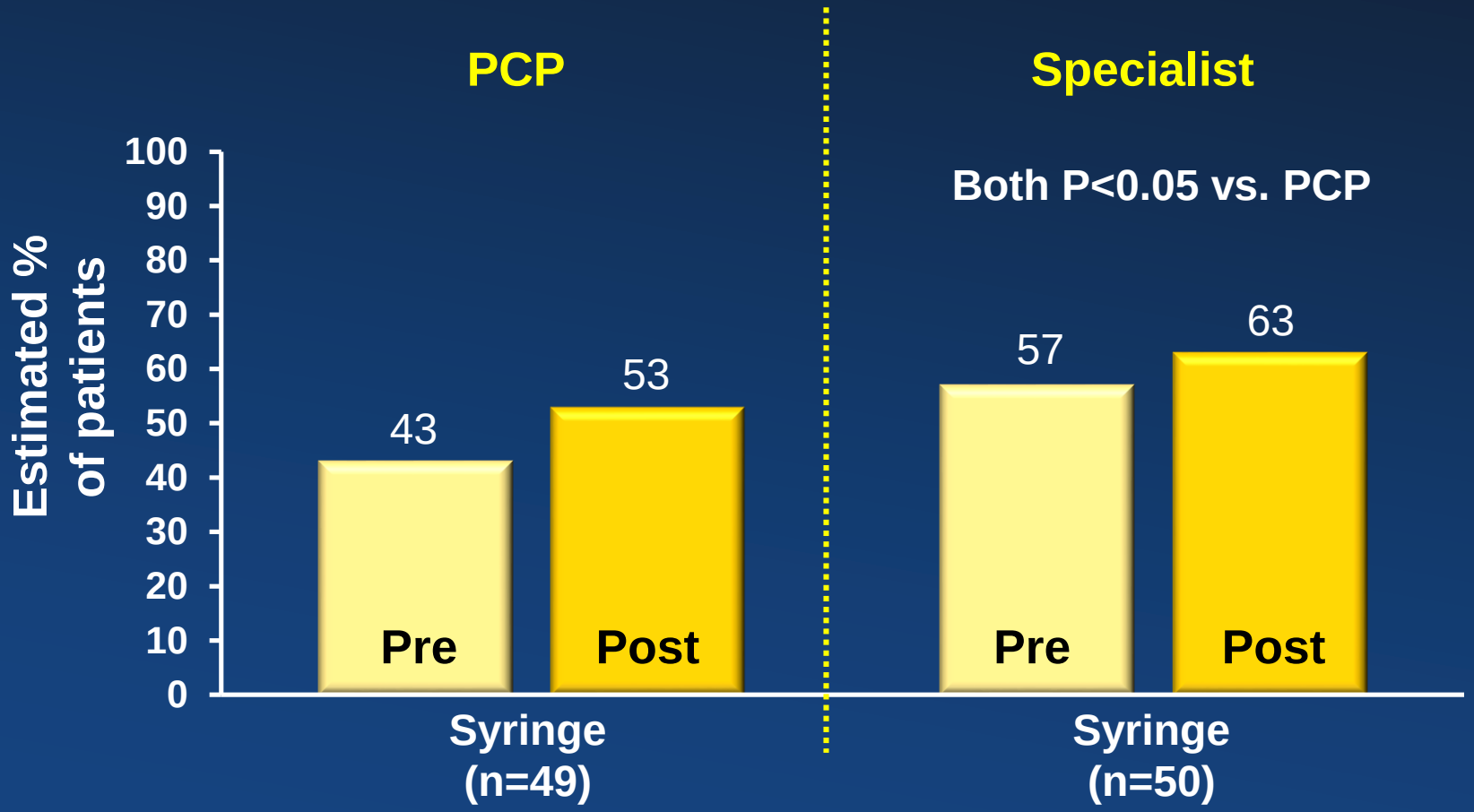
Physician Estimates of Patient Willingness to Self-Inject: PCPs vs. Specialists (Pen)

- Specialist estimates were higher than PCP estimates



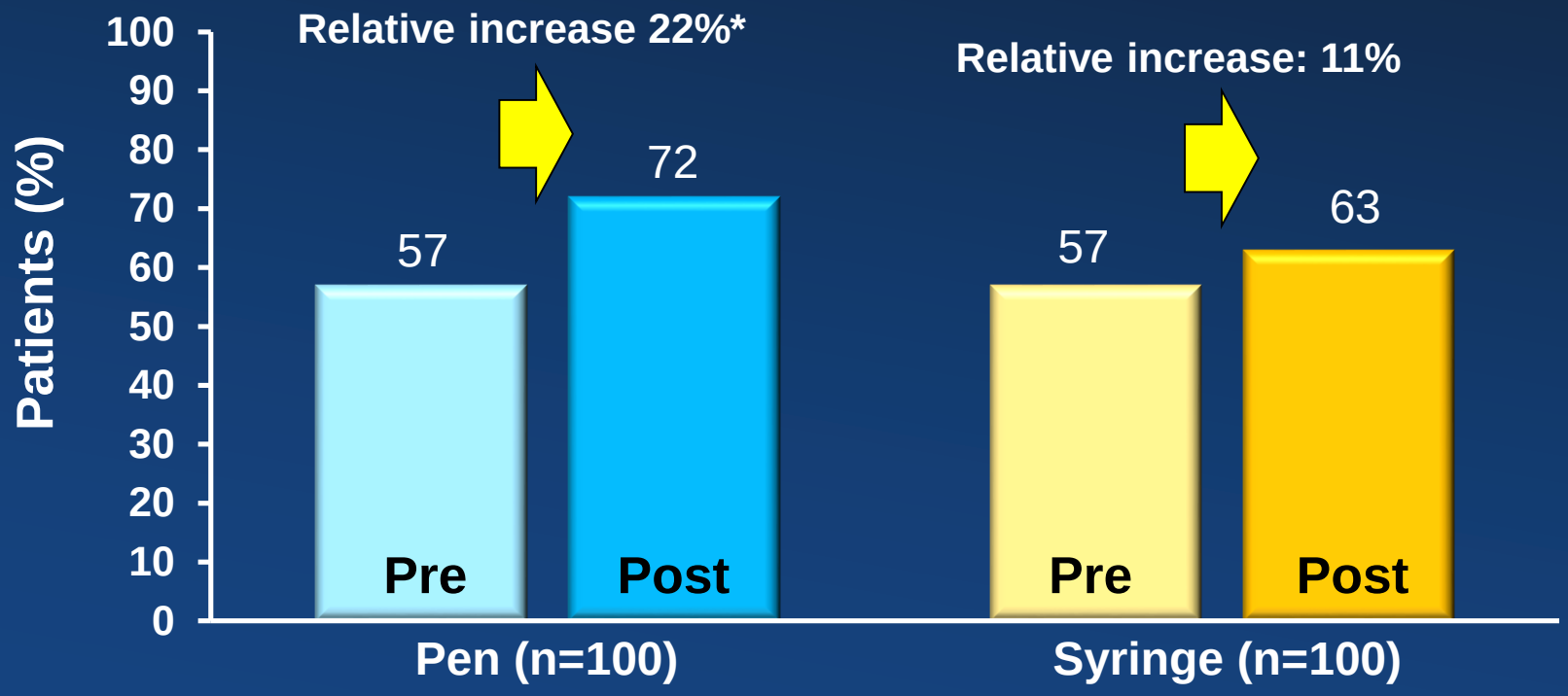
Physician Estimates of Patient Willingness to Self-Inject: PCPs vs. Specialists (Syringe)

- Specialist estimates were higher than PCP estimates



Patients Reporting They Would Be "Very Willing" to Self-Inject According to Device

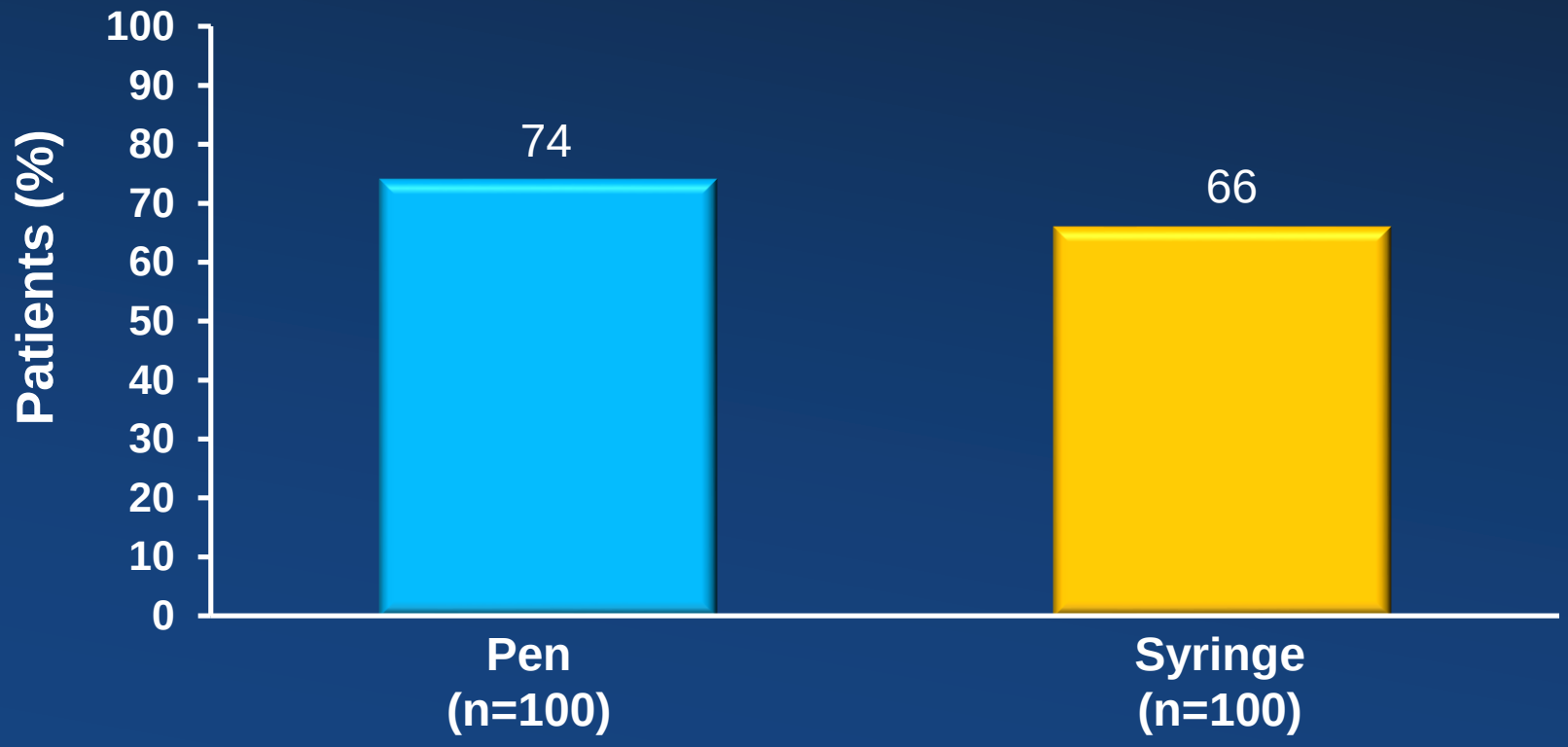
- The proportion of patients who reported they would be "very willing" to self-inject increased after testing



*P<0.05, after testing vs. before testing

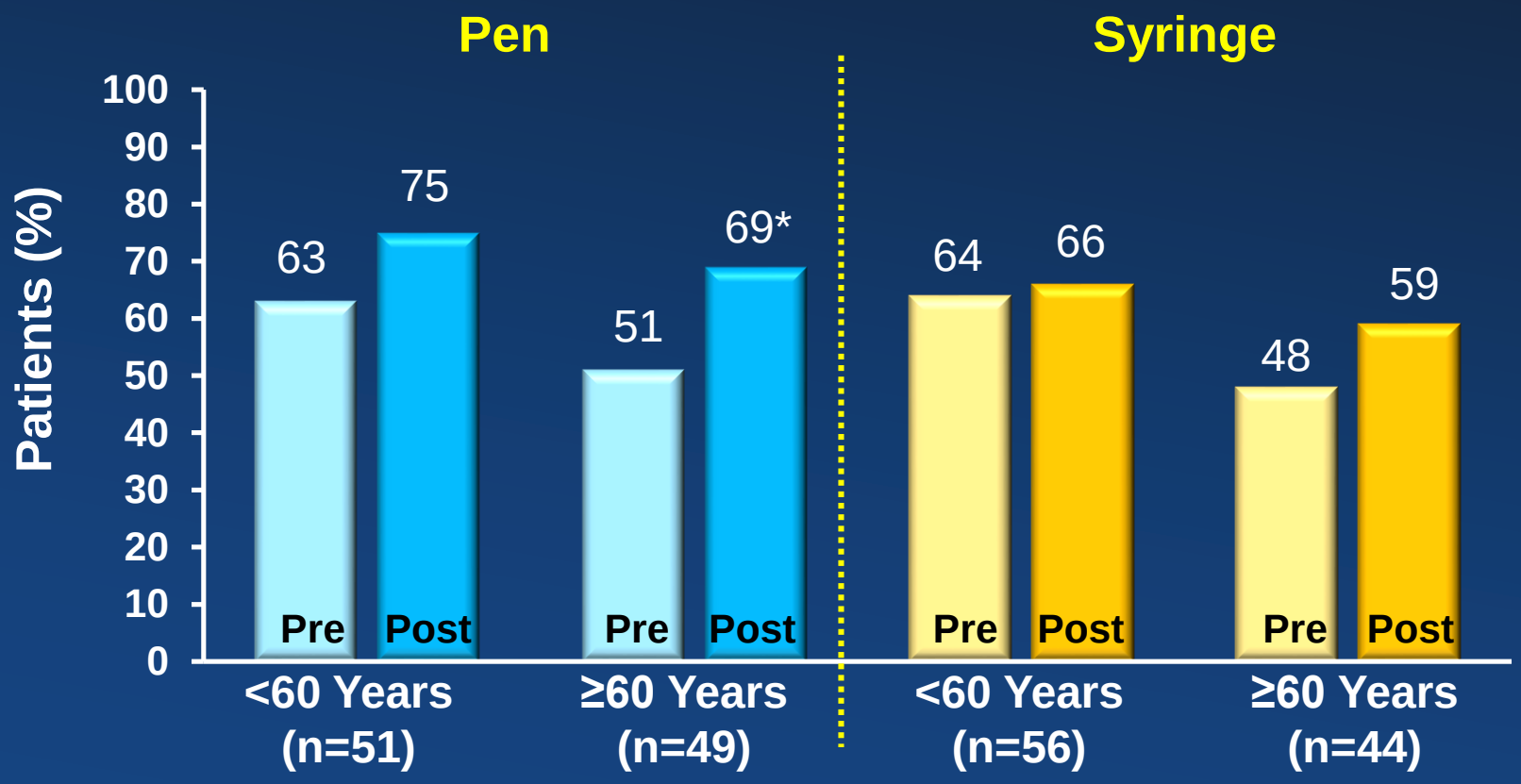
Patients Who Reported They Would Be Confident With Injecting At Home After Testing

- After testing, the majority of patients indicated that they would be confident with self-injecting at home



Those ≥60 vs. <60 Years Reporting They Would Be "Very Willing" to Self-Inject

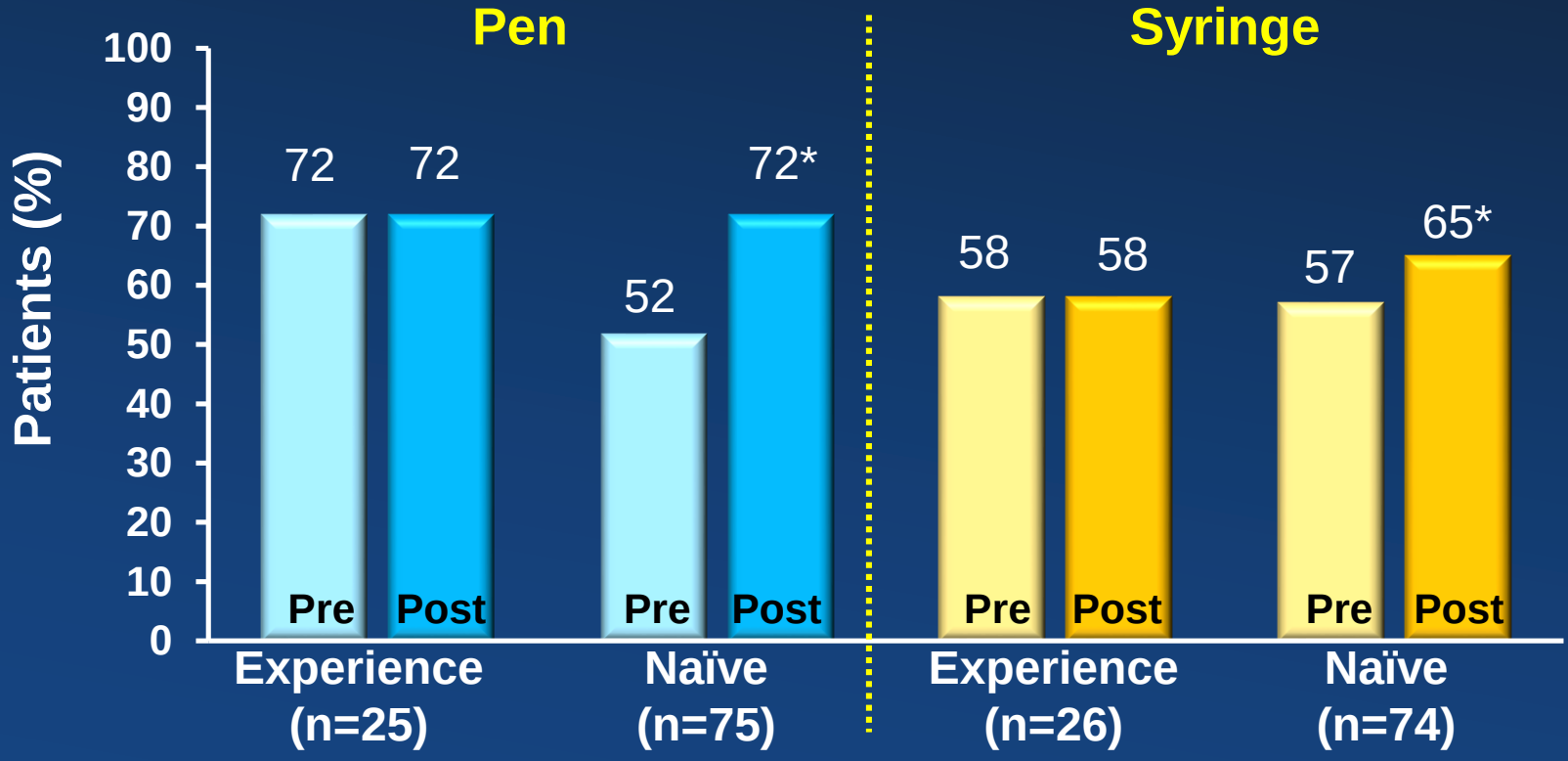
- There was a numerical but not statistical difference between responses for those ≥60 vs. <60 years



*P<0.05; relative increase of 35% vs. pre-testing

Patients Reporting They Would Be "Very Willing" to Self-Inject by Level of Injection Experience

- Initially, patients with previous injectable medication experience were more willing to use the pen vs. injection-naïve patients; after testing there was no difference between groups



*P<0.05; relative increases of 38% (pen) and 14% (syringe) vs. pre-testing

Doses and Region

- **Doses:** No significant differences were observed in participant responses between the 75 mg and 150 mg doses
- **Region:**
  - There were no significant differences between responses of physicians based in the US vs. the EU
  - A greater proportion of patients in the US (82%) stated they would be very willing to self-inject with the pre-filled pen after testing compared with those from the EU (62%) ($p<0.05$)
    - No regional differences were found when using the pre-filled syringe

Conclusions

- Self-injection with alirocumab pre-filled pen and syringe devices was well accepted
- Devices were considered easy to operate, particularly after demonstration and testing
  - Willingness to use the pen device was slightly higher than the syringe
- Results suggest that in clinical practice, administration of alirocumab by either pre-filled pen or syringe would be acceptable for the majority of patients and physicians

Q&A