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A multi-center evaluation of clinical pathways cost and time using real-life data in patients treated for their breast cancer by Trastuzumab intravenous and subcutaneous in day sessions

Objective

Trastuzumab (Herceptin®), a monoclonal antibody and targeted therapy, is indicated for the treatment of adult patients with breast cancer overexpressing the HER2 receptor. There are two forms of administration, intravenous (IV) and subcutaneous (SC). Different published clinical studies have demonstrated the non-inferiority of trastuzumab subccutaneous (SC) administration versus intravenous (IV) in terms of efficacy, safety and preferably in the treatment of patients with HER2 positive. The objective of the study is to evaluate the organizational and economic impacts generated by the administration of the SC versus IV form with health facilities' perspective.

Method

An observational and multicenter study was conducted in patients with breast cancer overexpressing HER2. For one month (14/11/2016 to 15/12/2016), 9 healthcare facilities consecutively included patients among their active file regarding 2 types of data : (a) a questionnaire to be completed for each center to collect data on the organizational model for the management of patients with HER2-positive breast cancer (all stages) treated with trastuzumab (IV or SC); (b) a questionnaire to be completed for each patient to anonymously collect the different pathway characteristics of the patient with HER2-positive breast cancer treated with trastuzumab (IV or SC).

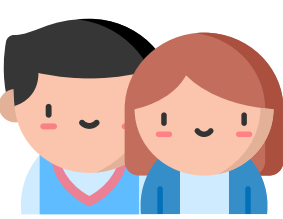
A comparative SC versus IV analysis (Pearson's Chi-two test and Student's T-test, 0.05 significance threshold) was conducted on the following criteria: (1) preparation time by pharmacy, (2) pathway time during administration and (3) economic evaluation of consumable costs for preparation and administration (expressed in 2016 costs)

Conclusion

This multicentric study highlights the benefits for patients (pathway time) and for care centers (costs) of trastuzumab SC administration compared to the IV form.

Trastuzumab SC preparation is on average significantly faster than IV preparation, which brings an organizational gain for the hospital center. On the other hand, SC trastuzumab administration pathway is on average significantly faster than IV trastuzumab administration pathway, which improves the quality of care for patients. Finally, the average cost of consumables is significantly less expensive by 89% for SC formulation compared to IV formulation. This study also shows the impact of organizational models on care pathway of patients.

Results



Patients characteristics

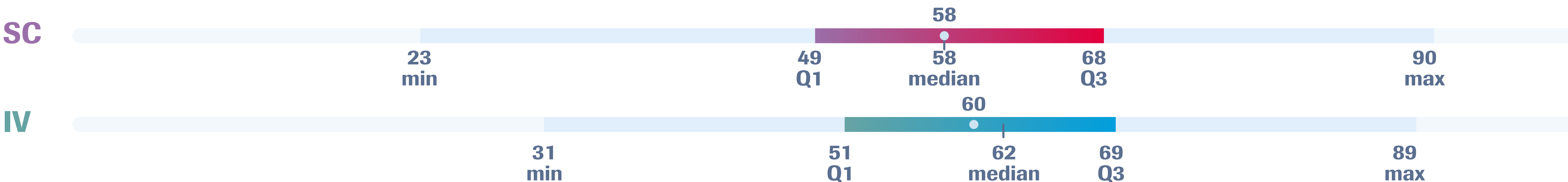
COHORT

TOTAL 411 patients

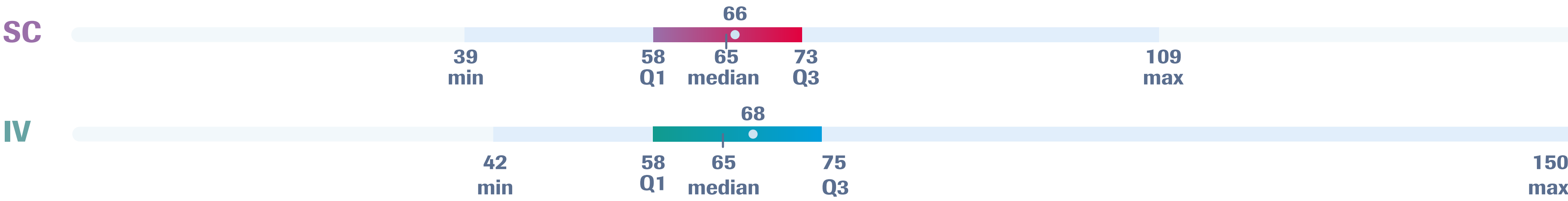


SC 40% 245 patients IV 60% 167 patients

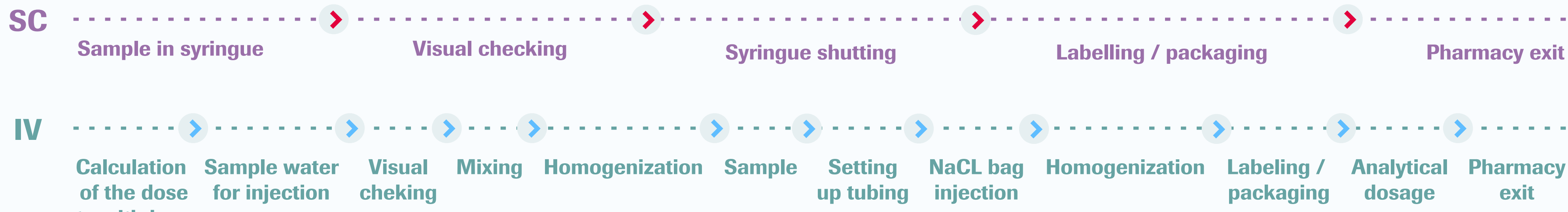
AGE (YEARS)



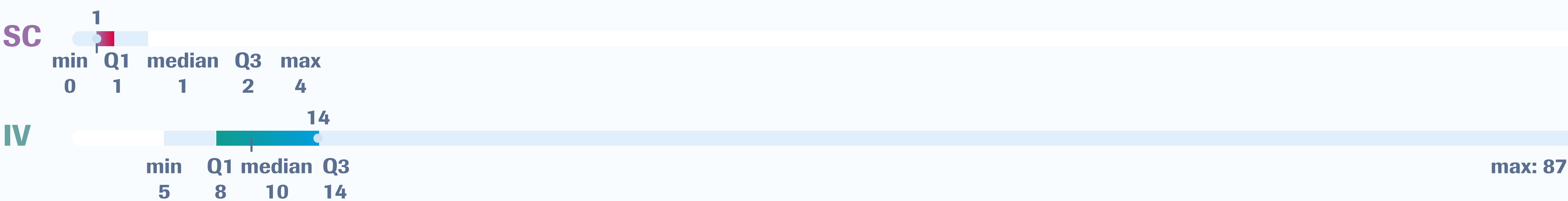
WEIGHT (KG)



Preparation time in pharmacy

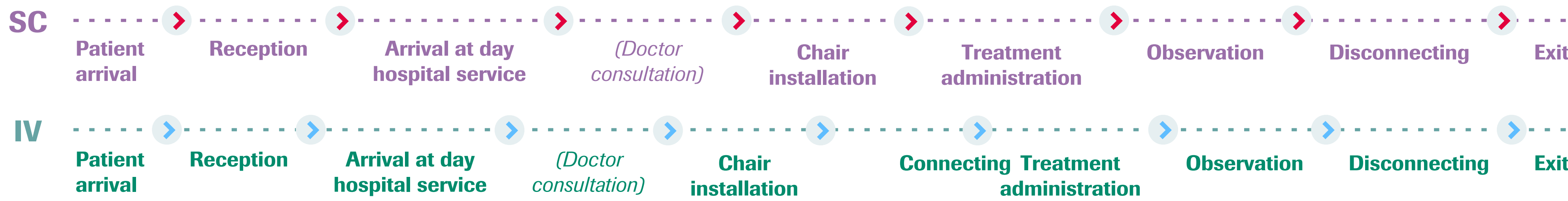


ANALYSIS OF TREATMENT PREPARATION TIME (MINUTES)

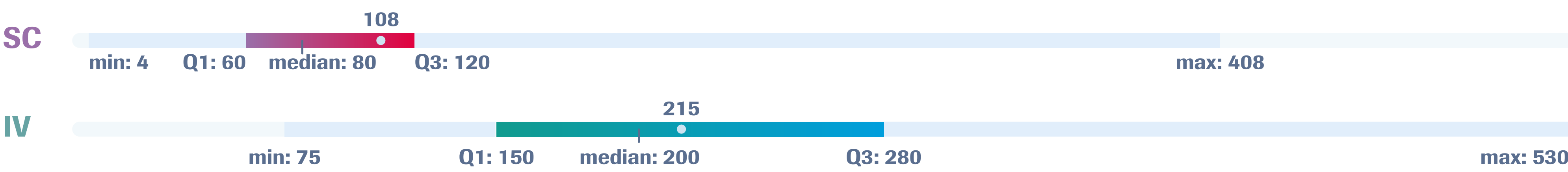


The average total preparation time is 1 minute ($\pm$ 1 min) for the SC formulation and 14 minutes ($\pm$ 12 min) for the IV formulation. Average preparation times are significantly different between SC and IV groups ($p < 10^{-4}$) and significantly longer of 13 minutes ($\pm$ 7 min) for the IV formulation.

Pathway time for administration



ANALYSIS OF TOTAL SESSION TIME (MINUTES)



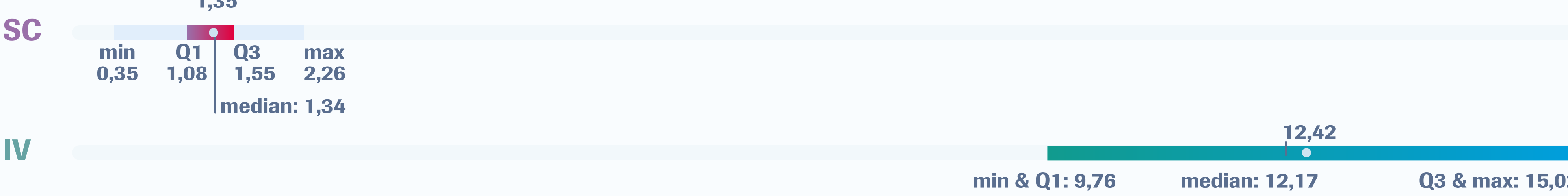
The total average pathway time is 151 minutes ($\pm$ 96 min): 108 minutes ($\pm$ 75 min) for SC formulation and 215 minutes ($\pm$ 87 min) for IV formulation. These average pathways are significantly different between SC and IV groups ($p < 10^{-4}$), and significantly 107 minutes ($\pm$ 80 min) longer for IV formulation.

Consumables costs for preparation and administration of trastuzumab

TYPE OF CONSUMABLES FOR THE ADMISNITRATION OF HERCEPTIN® SC VS IV ()

- Drip set
- Secure Hubert needle
- Needle for SC 23g
- Needle 18g for preparation
- Site Y perfuser
- Rinse aid of 50 ml NaCl 0.9%
- Disconnection set
- 3 way luer lock faucet
- Syringe 30 ml luer lock for preparation 0,408
- 10 ml luer lock syringe for preparation
- NaCl 250 ml
- Secure administration device (Duoperf)

ANALYSIS OF COST" (EUROS)



For the 296 sessions (71%), the average cost is €5.27 excl ($\pm$ €5.48): €1.35 excl ($\pm$ €0.47) for SC formulation and €12.42 excl ($\pm$ €2.20) for IV formulation. Average consumables costs are significantly different between SC formulation and IV formulation ($p < 10^{-4}$), with an average difference of €11.07 excl ($\pm$ €1.36)

