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ORIGINAL RESEARCH

Nurses' perceptions on the usability of the Hyrimoz® Sensoready® autoinjector device

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Abstract

Background: Hyrimoz® (Sandoz adalimumab biosimilar) became available in the USA in July 2023, and is administered subcutaneously using a pre-filled autoinjector device, the Hyrimoz Sensoready® pen. As nurses are often responsible for training patients in the use of autoinjectors, this survey aimed to assess gastroenterology nurses' perceptions of autoinjectors in the USA.

Methods: Eligible participants included nurses in the USA currently working within a gastroenterology practice with experience managing inflammatory bowel disease and with reference to adalimumab, Humira®. Participants were sent the Hyrimoz Sensoready pen, which was opened during a web-assisted telephone interview. The survey assessed the importance of specified autoinjector device attributes as well as perceptions regarding both the Humira and Hyrimoz Sensoready autoinjector devices.

Results: A total of 123 nurses completed the survey. Participants rated simplicity of use, ease of performing self-injection, ease of learning to use the pen, ability to use an autoinjector pen independently and ease of preparation as the most important autoinjector attributes. When evaluating devices individually, participants awarded higher ratings to the Hyrimoz Sensoready pen over the Humira pen for all evaluated attributes. The greatest differences were reported for visual feedback mechanisms, ease of performing self-injection and the process to initiate injection. When directly comparing the devices, participants preferred the Hyrimoz Sensoready pen over the Humira pen overall, and for all individual attributes. Visual feedback and buttonless activation were the main qualitative features driving this overall preference.

Conclusion: Gastroenterology nurses in the USA expressed strong preferences for the Hyrimoz Sensoready pen *versus* the Humira pen when rating each device individually, and in direct quantitative and qualitative comparisons.

Keywords: adalimumab, adherence, autoinjector, biosimilar, Crohn's disease, inflammatory bowel disease, switching, ulcerative colitis.

Citation

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Introduction

Inflammatory bowel disease (IBD) encompasses Crohn's disease (CD) and ulcerative colitis (UC), which are characterized by chronic and relapsing inflammation of the gastrointestinal tract. Over 6.8 million people worldwide, including 1.5 million North Americans, are thought to have IBD, resulting in a significant burden on healthcare systems due to medication costs, hospitalization and productivity loss.[1]

Various molecules have been targeted for the treatment of IBD, including tumour necrosis factor (TNF), which has been the molecular target of several biologics, including the monoclonal antibody adalimumab. Anti-TNF biologics have been a key part of the treatment for CD and UC, as well as for other immune-mediated inflammatory diseases, for decades.[2–4]

Reference adalimumab, Humira® (AbbVie Inc.), has been available in the USA since February 2007 for the treatment of CD and, since September 2012, for the treatment

of UC.[5] Humira is approved for rheumatoid arthritis (RA) in adults, juvenile idiopathic arthritis, psoriatic arthritis in adults, ankylosing spondylitis in adults, CD in patients aged ≥6 years, UC in patients aged ≥5 years, plaque psoriasis in adults, hidradenitis suppurativa in patients aged ≥12 years and uveitis in patients aged ≥2 years. Humira is administered via a pre-filled autoinjector device, the Humira pen.[6] The Humira pen has a circular cross-section and a window on its side for observing dose delivery, which is completed using a button on the end of the pen.

The Sandoz adalimumab biosimilar Hyrimoz® was granted initial approval in the USA in 2018. Hyrimoz is currently approved for RA, juvenile idiopathic arthritis, psoriatic arthritis, ankylosing spondylitis, plaque psoriasis, hidradenitis suppurativa and UC in adults, and for CD in patients aged ≥6 years, and it became available for use in the USA in July 2023.[7,8] Hyrimoz is available in formulations with high concentration and lacking the excipients sodium citrate or citric acid,[8] which have been linked to injection-site pain in high concentrations.[9,10] Hyrimoz is administered subcutaneously using a pre-filled autoinjector device, the Hyrimoz Sensoready® pen.[8] The Hyrimoz Sensoready pen has a triangular cross-section and a 360° window for observing dose delivery, which is completed using a two-step, buttonless system.

Appropriate design of an autoinjector is essential to facilitating patient adherence. Autoinjector features that simplify self-administration and minimize injection-site pain should be developed and included where possible.[11] Training patients in the use of autoinjectors is key to improving the use of autoinjectors by patients, and is part of the vital role played by nurses in the treatment of patients with IBD. Nurses also provide other key healthcare and patient self-management information to patients, as well as being an integral part of the multidisciplinary team required for the optimal care of patients with IBD.[12]

Clinical trials and analyses of real-world data have assessed device usability for autoinjectors. Patient perceptions of the Hyrimoz Sensoready autoinjector have been studied in RA,[13–16] psoriatic arthritis,[17] psoriasis,[18,19] multiple sclerosis (MS)[20,21] and Crohn's disease.[16] In some of these studies, the preferences of nurses who treat patients with RA[15] or MS[20] have also been assessed. In these studies, patients and nurses consistently preferred the Hyrimoz Sensoready pen over its competitors in terms of physical attributes and usability. However, no survey on the Hyrimoz Sensoready pen has yet explored the views of nurses who treat patients with IBD.

This survey of gastroenterology nurses in the USA was designed to assess nurses' perceptions regarding the Hyrimoz Sensoready pen, and the degree to which unique features might influence patient education when compared with the reference medicine autoinjector device, the Humira pen.

Methods

Survey participants

Participants included nurses in the USA who met the following inclusion criteria: currently working within a gastroenterology practice with experience managing IBD, a minimum of 3 years of experience working with the Humira autoinjector device, and experience educating and training patients on the correct use of this autoinjector.

Participants were excluded if they were employed and/or paid by a pharmaceutical company or healthcare manufacturer, served as a clinical investigator conducting clinical trials or provided consulting services in IBD, or were employed and/or paid by a market research firm or advertising agency at the time of the survey.

All participants meeting the inclusion criteria were included in the survey on a continuous basis until at least the desired sample size of 120 participants was reached. The sample size was based on the average differences in preferences observed between the Hyrimoz Sensoready and Humira pens in an earlier survey in Europe of patients with RA and nurses.[15]

Survey design

Gastroenterology nurses were identified through gastroenterology practices and invited to participate in the survey via email. Willing participants were then screened via phone or email to assess their eligibility for inclusion in the study on a rolling basis.

Eligible participants were scheduled to complete a web-assisted telephone interview. Participants were sent the Hyrimoz Sensoready autoinjector pen, with instructions not to open the device prior to the interview. Data were recorded using a one-on-one web-assisted interview technique. Interviews lasted approximately 45–60 minutes.

This survey used a mixed-methods approach to include qualitative-oriented (descriptive and open-ended) and quantitative-oriented (ratings and rankings) questions. Qualitative questions were centred on nurses' perceptions regarding both autoinjector devices. Quantitative questions gauged nurses' perceptions regarding the importance of specified autoinjector attributes. The questions asked during the survey are provided in the Supplementary Material (available at: https://www.drugsincontext.com/wp-content/uploads/2025/08/dic.2025-4-1-Suppl.pdf).

Research conduct, including participant screening, interviews, data analysis and reporting, was carried out by an independent agency without any interference from the sponsor. Participants did not know which company was sponsoring the survey until after completing the survey. Participants were provided an honorarium of US$185 for completing the entire study.

Compliance with ethics guidelines

This study complied with all local Institutional Review Board guidelines. The informed consent form (ICF), study protocol, study survey and respondent invitation materials were submitted for review and approval to Advarra IRB (Columbia, MD, USA). This survey was conducted in accordance with the 1964 Declaration of Helsinki and its later amendments. All participants provided informed consent.

Data analyses

Data were collected between 9 May and 11 June 2023. Data were analysed for all participants who met the inclusion criteria and completed the survey.

To assess variability between the Humira and Hyrimoz devices, quantitative data were analysed by comparison of top-two box scores (a score of 9/10 or 10/10) for device attribute ratings and rankings. For statistical analyses, the Wald χ^2 test was applied to all comparisons of performance ratings for each device, and the χ^2 test was applied to direct comparisons of the two devices, similar to a recent survey of patients in Canada regarding their perceptions of the same devices.[16] R version 4.2.2 (R Project) was used for all statistical analyses.

Qualitative analysis involved content, thematic and narrative analysis. These data were organized by how often themes and factors driving participant preference and behaviour were mentioned. Narratives and themes relating to device preferences were compared.

Results

Participant experience in gastroenterology and in patient training

A total of 176 nurses were sent the ICF, which was signed by 137 nurses. Of the remaining 39 nurses, 26 were lost to follow-up after reviewing the ICF and 13 declined based on the content in the ICF. Of the 137 who signed the ICF, 123 successfully completed the screening process, 9 were no longer interested after seeing the screening criteria and 5 were disqualified. Of those disqualified, 2 were physician assistants and 3 were not involved in direct patient education regarding use of an autoinjector.

Of the 123 nurses who completed the survey, most participants were based in the Midwest (*n*=39), the Northeast (*n*=34) and the Southeast (*n*=32) of the USA. Participants had a mean period of experience in gastroenterology of 7.5 years (range 3–38 years) and a mean period of experience with self-administration pens of 6.3 years (range 3–24 years) (Table 1).

Importance of general autoinjector device attributes for nurses

Participants rated their overall satisfaction with all comparator autoinjector devices used to administer treatments for IBD, using a scale of 1–10, where 1 is not satisfied and 10 is extremely satisfied. Participants gave a mean score of 8.5/10.

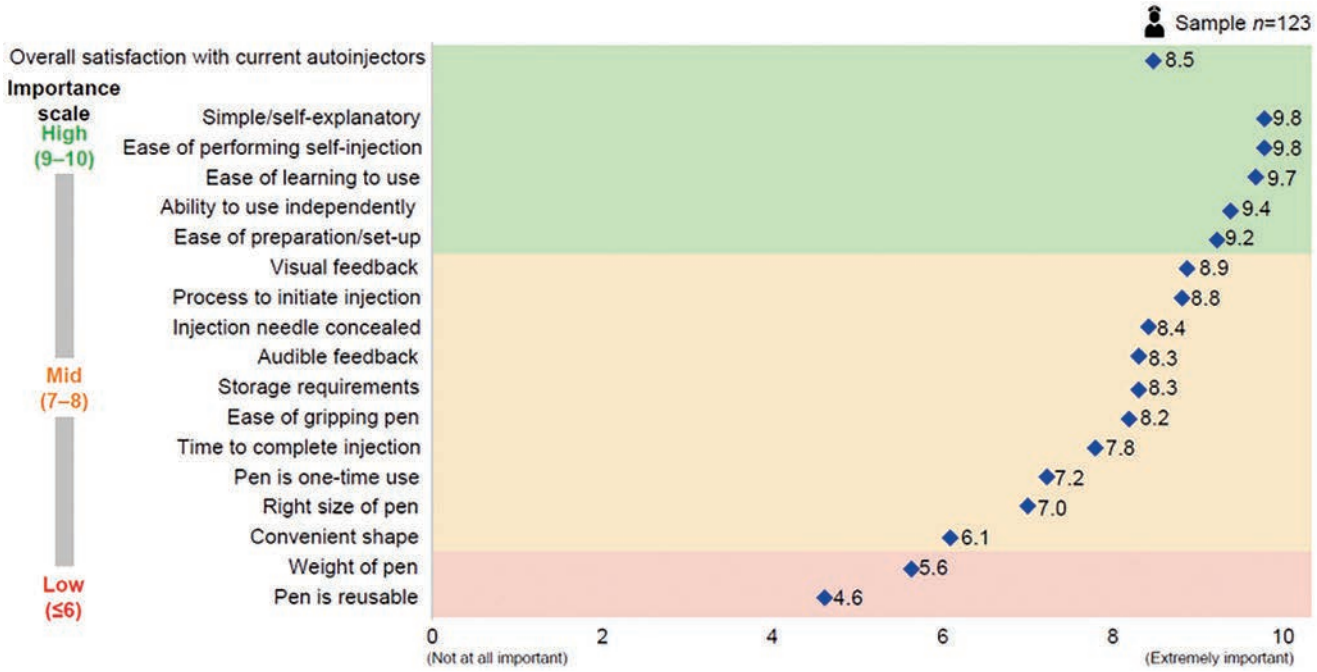
Participants then rated the importance of individual attributes for autoinjector devices in general, in relation to the patient's ability to effectively use the autoinjector pen, using a scale of 1–10, where 1 is not at all important and 10 is extremely important. The simplicity of use, ease of performing self-injection, ease of learning to use the pen, ability to use an autoinjector pen independently and ease of preparation were rated the most important attributes for an autoinjector device, achieving scores of 9/10 or 10/10 (Figure 1). Other physical attributes of a pen (e.g. size, shape, weight and reusability) were consistently rated lower in over-

Table 1. Relevant experience of participants who responded to the survey (*n*=123).

Experience	Participants, *n* (%)
Practice setting	
IBD/GI clinic	57 (46)
Private practice	53 (43)
Hospital-based practice (outpatient)	9 (7)
Non-hospital institution	2 (2)
Private — own infusion centre	2 (2)
Experience as a gastroenterology nurse, years	
3–5	68 (55)
6–8	22 (18)
9–11	11 (9)
≥12	22 (18)
Experience with self-administration pens for IBD, years	
3–5	75 (61)
6–8	22 (18)
9–11	12 (10)
≥12	14 (11)

GI, gastrointestinal; IBD, inflammatory bowel disease.

Figure 1. Importance of attributes for an autoinjector pen in general, expressed as mean scores (0–10).



Importance ratings are on a scale of 1–10, where 1 is not at all important and 10 is extremely important to the participant.

all importance, although only weight and reusability achieved scores below 6/10 (Figure 1).

Nurses' perceptions regarding the Hyrimoz Sensoready pen and Humira pen

Rating each device individually

Participants rated the performance of the Hyrimoz Sensoready pen and the Humira pen for each attribute, except for reusability and one-time use, as these attributes are not relevant to these two autoinjector devices.

The Hyrimoz Sensoready pen was more highly rated, as determined by the top-two box score, for all attributes compared with the Humira pen. The greatest differences between the autoinjectors are related to visual feedback, process to initiate injection and ease of performing self-injection, as shown by the red arrows in Figure 2.

The preference for the Hyrimoz Sensoready pen *versus* the Humira pen was statistically significant for most attributes assessed, except for time to complete injection, convenient shape and injection needle concealment (Figures 2 and 3).

Direct comparison of the two devices

When asked to select a preference for either the Hyrimoz Sensoready pen or the Humira pen, the participants consistently preferred the Hyrimoz Sensoready pen, with the margin in favour of the Hyrimoz Sensoready pen being statistically significant ($p \leq 0.05$) for every attribute assessed (Figure 4).

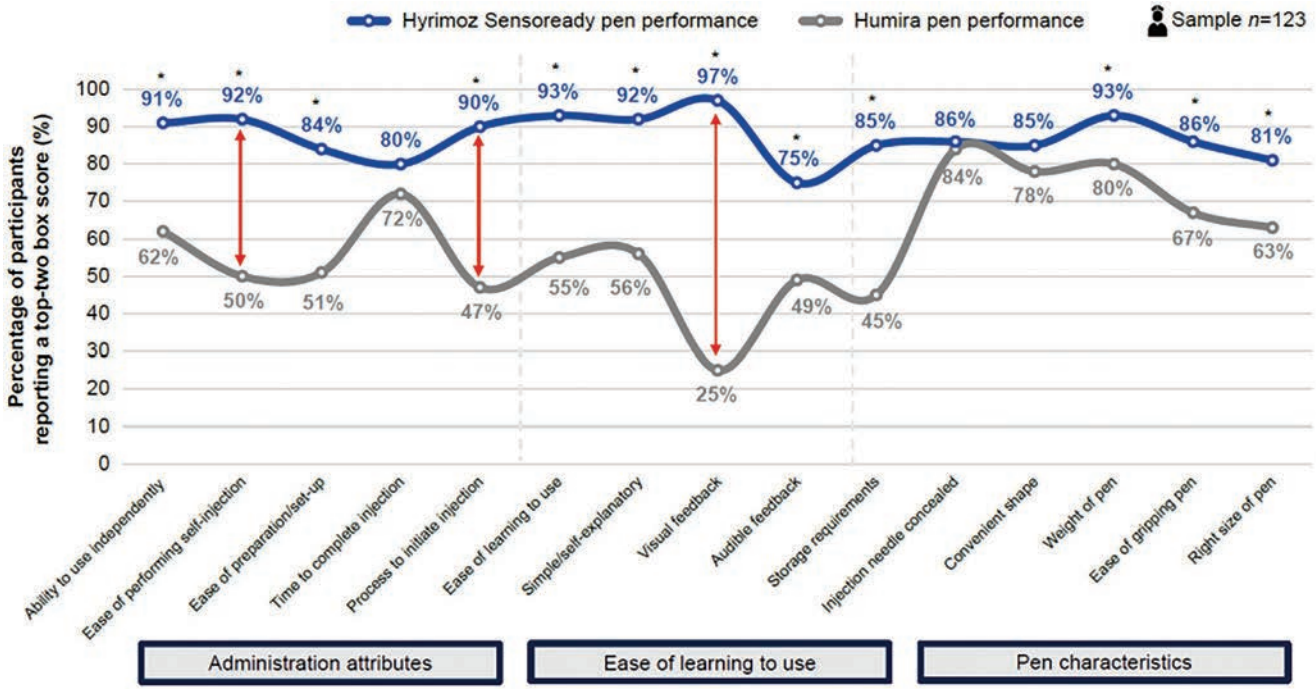
Qualitative drivers of participant preference for the Hyrimoz Sensoready pen

Participants were asked which device they would consider to be more convenient for patients with IBD. All participants responded that they would consider the Hyrimoz Sensoready pen more convenient, with 68 citing visual feedback and 60 citing buttonless activation in unaided responses (Figure 5).

When asked about the helpfulness of individual device features, participants consistently perceived all features of the Hyrimoz Sensoready pen as helpful, with all 123 participants describing the viewing window, the size of the viewing window, and the colour indicator as helpful. Buttonless activation was considered helpful by 120 participants (98%).

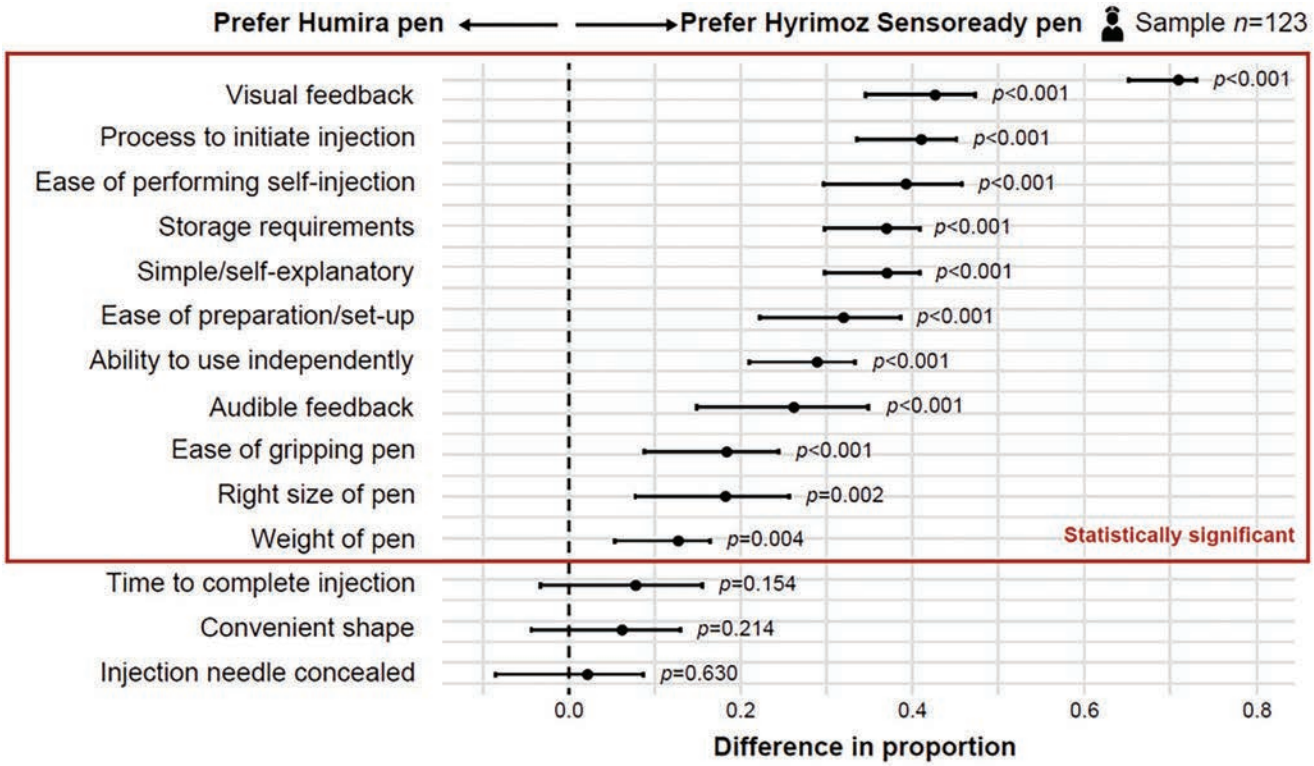
Participants noted the benefits of the viewing window for allowing patients to track progression of injection and provide reassurance for when the injection was complete. More specifically, participants considered the size of the viewing window an improvement *versus* the Humira pen for its easier visibility and the 360° visibility allowing for

Figure 2. Comparison of individual performance ratings — Hyrimoz Sensoready pen *versus* Humira pen.



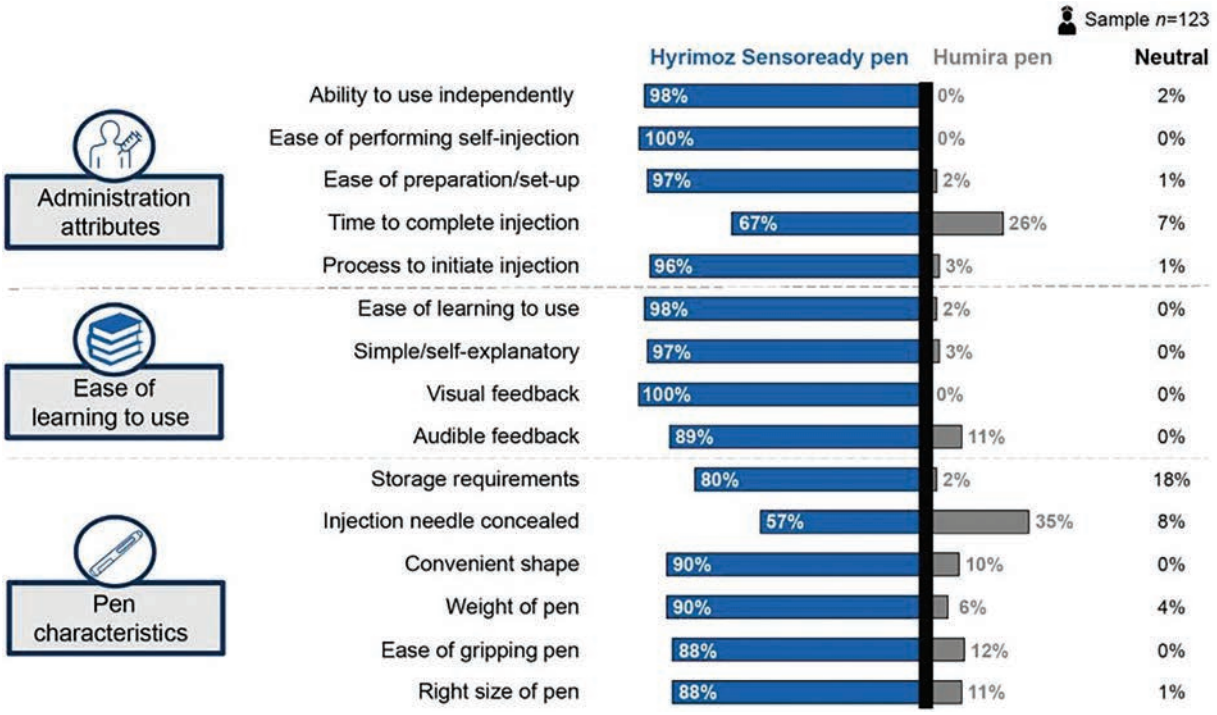
Statistically significant difference ($p \leq 0.05$) between Hyrimoz and Humira scores are indicated by an asterisk. *p*-values were calculated using a Wald χ^2 test. Red arrows indicate the greatest nominal differences in device ratings.

Figure 3. Preference for Hyrimoz Sensoready pen *versus* Humira pen, based on individual performance ratings.



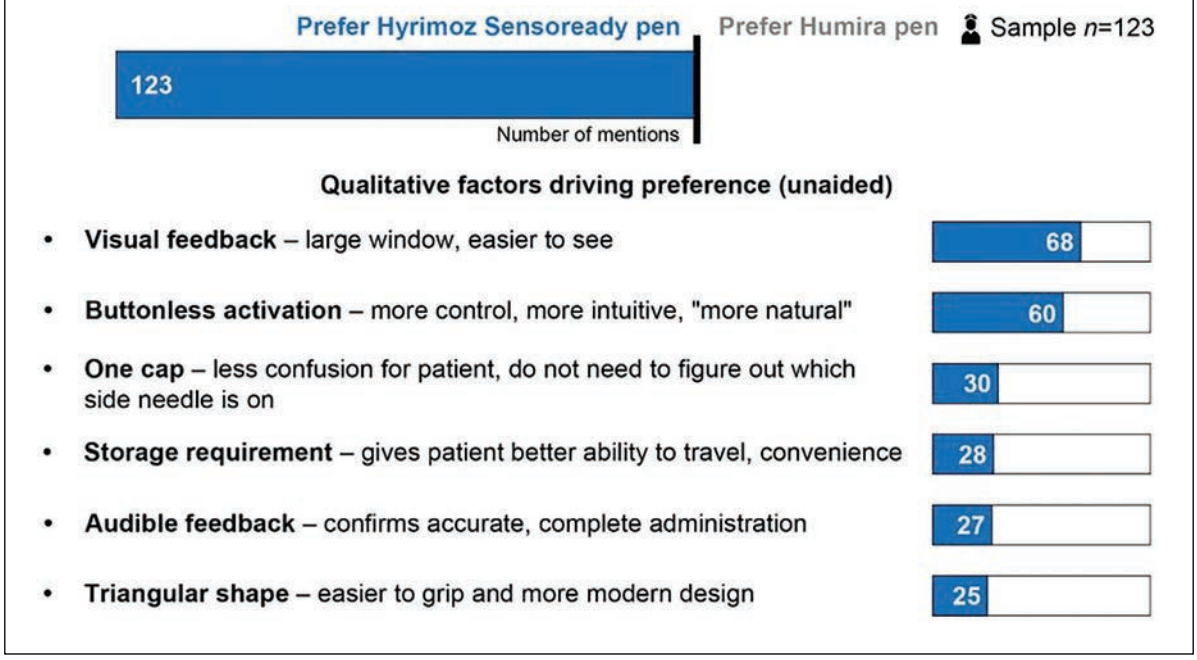
The 95% confidence intervals are shown for the proportion of participants reporting a top-two box performance score for each attribute. Statistical significance of differences between the Hyrimoz Sensoready pen and the Humira pen preferences was assessed using a Wald χ^2 test.

Figure 4. Preference for Hyrimoz Sensoready pen *versus* Humira pen, by direct comparison.



All observed differences between Hyrimoz and Humira scores were statistically significant ($p \leq 0.05$).

Figure 5. Qualitative preferences for Hyrimoz Sensoready pen *versus* Humira pen.



injection from different angles, avoiding patients having to bend over or angle the device to confirm injection.

For the colour indicator, participants noted that the brighter colour is easily visible from all angles, which would be particularly helpful for any patient with poor eyesight. For buttonless activation, participants indicated that this feature would simplify the injection process, thereby reducing stress and anxiety regarding the injection, and reducing hesitancy to activate injection.

Unaided descriptions of the Hyrimoz Sensoready pen included the following:

- *"The window is great. There is no guessing, and it provides adequate visualisation for the patient."*
- *"Even though this may sound minor, the one cap would eliminate any potential confusion about the two caps of the Humira device, particularly for patients with poor visual acuity."*
- *"The size and shape are really good. It is ergonomic and little coordination is needed. This is especially helpful for the elderly population."*

Nurses' perceptions of training patients on the Hyrimoz Sensoready pen

Participants were asked if they expected to be effective in training patients on the use of the Hyrimoz Sensoready pen on a scale of 1–10, with 10 indicating the highest effectiveness.

In total, 96% of participants gave a score of 9/10 or 10/10 regarding their expected effectiveness in training their patients, providing the following observations:

- *"This will be extremely easy. There is no need to focus on avoiding misfiring."*
- *"The only thing I will have to teach these patients is to make sure the green indicator goes all the way down."*
- *"It feels more self-explanatory because I will not have to explain the two caps or to push the button down."*
- *"It will definitely be easier than teaching patients on the use of Humira."*
- *"This device is quicker, with only one cap and much more user-friendly than Humira."*
- *"This is very easy to use. Patients will pick it up with no problem."*
- *"It's simple to use and I plan to train my patients with visual instructions and the demo pen."*
- *"There are fewer steps, so it is a lot easier. Patients are always afraid they will forget about something."*

Discussion

Among the nurses involved in the training of patients using autoinjectors in the treatment of IBD, the Hyrimoz Sensoready pen was preferred *versus* the Humira pen for every attribute assessed in this survey, when comparing performance scores for each autoinjector and when asking the participants to choose between the devices directly. The preference for the Hyrimoz Sensoready pen was statistically significant for every attribute in the direct comparison.

The surveyed nurses considered simplicity of use, ease of performing self-injection, ease of learning to use the pen, ability to use an autoinjector pen independently and ease of preparation to be the most important attributes for an autoinjector device. They gave these attributes consistently higher performance scores for the Hyrimoz Sensoready pen compared with the Humira pen. Notably, the nurses gave consistently significantly higher performance scores for the Hyrimoz Sensoready pen compared with the Humira pen for all attributes relating to the ease of learning to use a device, which are the attributes most likely to have the greatest direct impact on nurse time and resources when training patients in self-injection.

These findings are consistent with earlier surveys with the Hyrimoz Sensoready pen for various indications. In a European survey of 200 patients with RA and 100 nurses, both patients and nurses considered ease of self-injection and visual feedback to be among the most important attributes of an autoinjector device.[15] When comparing the Hyrimoz Sensoready pen (Erelzi®; etanercept) with other available injection devices, including the Humira pen, patients rated the Hyrimoz Sensoready pen higher than its competitors in overall satisfaction and as the best or second-best device for every attribute assessed, notably ease of use and visual feedback. Patients consistently rated the Hyrimoz Sensoready pen more highly than the Humira pen. Nurses rated the Hyrimoz Sensoready pen higher than its competitors in overall satisfaction and for 9 out of 10 attributes assessed.[15]

In the second survey (in Europe and the USA), 80 patients with MS and 50 nurses reported ease of training, ease of preparation and setup, ease of self-injection, simplicity of use, and visual feedback as being among the most important attributes of an autoinjector.[20] Nurses and patients also preferred the Hyrimoz Sensoready pen (ofatumumab) over comparator autoinjectors for their treatment, mostly driven by the same attributes.[20] In this particular study, visual feedback was very important for nurses and patients, whereas audible feedback had less importance, similar to the current study. These two nurse surveys align with the current survey, suggesting that the findings of these surveys are applicable to nurses working in other disease areas.

A device study, as part of the COMPACT study, explored patients' perceptions of the Hyrimoz Sensoready pen in patients with rheumatic diseases.[14] The COMPACT study is a real-world study of GP2015, a biosimilar etanercept, which is administered using the Hyrimoz Sensoready pen. In an interim analysis, most patients with RA were satisfied/very satisfied with self-injection, and 85% of patients were willing to continue self-injection following the study.[14] In the final analysis, 459 patients with RA reported high mean scores for the Self-Injection

Assessment Questionnaire, including those switching from reference etanercept or another biosimilar etanercept to GP2015,[13] indicating that prior device experience did not influence satisfaction with the Hyrimoz Sensoready pen, and that switching had no impact on patient experience.

The Hyrimoz Sensoready pen has also been assessed in clinical studies. In the phase III JUNCTURE[18,19] and FUTURE 3[17] trials, patients with plaque psoriasis or psoriatic arthritis, respectively, self-administered secukinumab using the Hyrimoz Sensoready pen. Based on the Self-Injection Assessment Questionnaire scores, patient acceptability of the Hyrimoz Sensoready pen was high in both trials. These results align with the surveys of nurses, indicating that nurses are well placed to determine whether devices are appropriate for their patients.

A limitation of this survey is that nurses were familiarized with the Hyrimoz Sensoready pen at the beginning of the survey and had not yet acquired experience with the device by training patients in its use. It may be of value to repeat the survey after the Hyrimoz Sensoready pen has been available in the US market, and it may also be useful to assess the perceptions of patients in the USA who use the Hyrimoz Sensoready pen for the treatment of IBD.

Conclusion

The participants in this survey, representing a wide range of nurses involved in the treatment of IBD in the USA, expressed strong preferences for the Hyrimoz Sensoready pen *versus* the reference medicine device. As a primary source of information and as primary care providers, nurses' perceptions should be considered when seeking to improve treatment adherence and satisfaction in patients with IBD. The views of gastroenterology nurses may also be relevant to self-administered biologics used in the treatment of other indications such as rheumatology and dermatology.

Supplementary Material available at: https://www.drugsincontext.com/wp-content/uploads/2025/08/dic.2025-4-1-Suppl.pdf

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