

EDC

Electronic Data Capture

& Information Technology



How ePRO Empowers
Patients and Research

PRESENTED BY



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Embracing Electronic PRO

Why ePRO edges out paper as the most reliable data source.

In today's technology focused world, paper-based administration is quickly becoming outdated. Despite the obvious benefits of adopting a paper free approach to data capture, the clinical trials industry continues to be apprehensive about using electronic methods. Patient reports can be the only way to reliably collect assessments pertaining to subjective information, such as the perception of pain and fatigue. It is essential that this data be captured accurately, using the most efficient instrument medium.

Approximately half of the 20-year patent protection period is spent on the drug development process. One of the largest cost and time commitments during this time is clinical trial testing and the associated data collection and reporting from the patients in the trial. On average, approximately \$6 million to \$11 million is spent on paper-based patient reported outcomes (PRO) capture. With regulatory costs and government levies on the rise, the industry may need to adopt a more streamlined and cost effective method of patient reporting.

The industry is familiar with the three main methods used in clinical trials to collect the important information from patients as they progress through a trial. Interactive Voice Response (IVR), electronic PRO (ePRO), and paper-based instruments are the primary ways to capture patient reported data. Each method has its own advantages for the clinical study management team, but it is fair to argue that in terms of accuracy, compliance, and efficiency, ePRO is outperforming its main rival: the paper questionnaire.

Paper vs. ePRO

Last year CRF Inc. conducted a study into compliance rates when using ePRO methods. The results were unequivocal: patient compliance when using electronic diaries is more than three times that for paper-based trials. As we know, paper-based trials usually have a patient compliance rate of around 30%. Compare this to the ePRO rate of 89.5% and this alone makes the argument for using electronic capture extremely persuasive.

So why is paper still proving more popular? The traditional argument against ePRO has been cost. Investing money into the purchase of eDiary devices from the outset can be off-putting for some. However, more and more clinical trials are moving to ePRO as sponsors begin to recognize the savings that come down the line through improved efficiency, speed, and accuracy of the data. In addition, the eDiary devices themselves can be reused for subsequent studies, lowering the effective cost of the hardware over time.

Risk is a major factor for the clinical trial team when deciding on the medium to use for PRO instruments. The traditional reluctance in using electronic data capture (EDC) methods has been attributed to an estimate of risk, with doubt over the security and stability of using an electronic device to capture the patient data. However, the risks associated with paper are far greater, with the potential for loss, damage, and inaccuracies.

ePRO reports can be sent to the study team in real time, removing the risk of losses in transit. All manner of accidents can happen, leading to the paper being damaged or even lost before ending up back in the hands of the study management team. ePRO also provides substantially more discretion and privacy for the patient; there is no possibility of a curious friend or relative inadvertently or intentionally browsing through a diary left lying out.

The FDA's ALCOA (Attributable, Legible, Contemporaneous, Original, Accurate) criteria for patient data in labelling claims have helped to substantiate the argument for using ePRO, as patient data is far more accurate when collected electronically.



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Electronic benefits

The common issues raised when collecting data from paper-based instruments are that of legibility and human error when interpreting handwritten answers. The margin for error is heavily increased when the study management team must decipher someone else's writing, without also taking into account that they could be physically unwell, in pain or have a disability that affects their coordination.

Spelling can also affect the accuracy of the data, as this can lead the team to make a possibly serious misinterpretation. With the administrative burden of typing up the handwritten responses removed, the clinical study team is free to spend this time on other aspects of the trial, such as monitoring patient safety or increasing enrollment.

Data accuracy is called into question when patients are asked to recall complex and sensitive information retrospectively. When using a paper-based instrument, the onus is on the patient to effectively recall their details—no easy task when you consider that the paper questionnaires can be filled in some time after the symptom or pain has occurred.

With an ePRO instrument, patients have the freedom to complete the information at the time they need to. The introduction of mobile devices means that patients now also have the flexibility to fill in their information from wherever they are, even when they're on the move. This allows the clinical team to get a real sense of the patient experience and as the patient data is captured in real time, allowing for more realistic and ultimately more accurate answers.

Paper impossibilities

Real-time access to data has even greater value for the clinical trial team. Clinical managers can get a snapshot view of their trial data, with instant visualizations of patient enrollment, compliance rates, and overall progress. When considering patient safety, this is invaluable, as potential issues can be spotted easily at any stage of the trial and the appropriate interventions can be instigated.

This also means an end to the frustrating wait for paper-based instruments to be collected, data to be prepared for analysis, and inaccuracies and extra information to be resolved. The electronic capture allows for accurate date and time stamps on each response, something that is impossible with paper. This information ensures that the team can see their patients' responses and know that they adhere to the criteria needed for timely data collection.

The design of the instrument on an electronic device puts the control back into the hands of the clinical trial team, as patients cannot add to their answers extraneous information. All too often a patient alters data when completing their paper instrument, adding what they feel is useful extra information, or even raising questions. These additional comments—however well intended—can actually result in a high query volume.

The additional time spent recording and interpreting this data can be significant, further escalating costs down the line. Each query raised must be investigated and has the potential to affect the data that is issued. With an electronic capture method, the instrument can be formatted so that patients choose from a list of options, with no space to add extra and possibly confusing information.

Designing ePRO

Clearly, the formatting and design of the electronic instrument requires time and planning at the start of the trial. Although initially this may seem to be a burden, a carefully planned electronic instrument will facilitate a smooth trial, with little administration needed at completion, as the data is captured, available, and ready to be analyzed.

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The best ePRO companies are experienced in working with the trial team during the design phase and make it a collaborative process. Trial managers need not worry that they will be left floundering with incomprehensible technology.

The use of ePRO enables the team to design comprehensive patient questionnaires that are easy for a patient to complete. With technology infiltrating so many aspects of modern life, from mobile phones to the Internet, the world at large is much more familiar with handling and understanding electronic devices. Plus, images can be used to make the questions more accessible. Graphical and visual representations add to the instrument and also give the ability to incorporate examples of what information is needed.

Touch screen functionality allows patients to easily enter their data in a more natural way, for example, by using the stylus or a finger to indicate on a body map where they feel pain. Navigating through an electronic questionnaire is logical, with a touch point at the end of every question, allowing patients to see just one question at a time, rather than feeling potentially overwhelmed by sheets of paper full of detail.

Any changes that occur midstudy can be attended to when using EDC. If a change to an instrument question is needed as a result of an amendment to the study, electronic methods are better suited to cascading the updated information.

Validation considerations

One of the key issues when comparing electronic instruments to paper instruments is the measurement of valid-

Six Areas of Distinction

Patient Compliance

- Compliance rate of paper-based clinical trials is 30%
- Compliance rate of trials that use ePRO is 89.5%.

Associated Risks

- Paper files may be lost or damaged by fire or flood
- ePRO results can be sent in real time to the study team, avoiding the loss of data in transit.

Privacy

- A paper diary left sitting out can be the target of curious friends or family members
- ePRO instruments require a user login, leaving curious friends or family out in the cold.

Accuracy

- Patient handwriting can sometimes be difficult to interpret and lead to erroneous interpretations
- ePRO answers are not handwritten, eliminating the need for interpretation and improving data accuracy.

Accessibility

- Paper forms must be completed, collected, and prepared before study teams have access to trial data
- ePRO technology removes the waiting game and allows for real-time access to trial data.

Unnecessary Extras

- Oftentimes patients will add unnecessary information when completing their paper instrument
- The design of ePRO instruments does not allow for patients to add extraneous information.

patient to complete the questionnaire with more concentration, rather than feel overwhelmed by a long paper list.

Face value

The user interface of an ePRO tool is an attractive feature of moving to electronic methods. The designs can be altered to make the input of data a more interesting and simple process, further encouraging patient compliance rates.

An added benefit is that the ePRO devices are able to interface directly with other wireless devices. This is ideal when conducting a study that involves the capture of other physiological data, such as blood sugar levels.

Seamless connection with devices such as spirometers and glucometers pave the way for more detailed studies, with less room for error when collecting information from a multitude of sources. It opens up opportunities for further technological advances, as the handheld devices can adapt quickly to software upgrades and new functionality. This will only increase in importance as the industry continues to migrate from paper to ePRO data collection.

A new culture

With all this information in mind, ePRO is emerging as not only a serious contender in the choice of capture methods but also as the way forward for the clinical trials industry.

Although paper still seems to be the overall preference for clinical trial managers, it must be accepted that the world is embracing the digital age and that the clinical trial industry cannot afford to

be the exception. Technology is no longer the sole reserve of the IT specialist.

With every new generation becoming more and more used to technology in daily life, there will come a point in time when it is expected that an electronic device will be used. Mobile devices will be a familiar, everyday tool for patients, and this will only further increase compliance rates.

So, how does the clinical trial manager choose which method to employ in their trial? The advice and guidance is available from the ePRO specialists. With a proven track record in improved accuracy and compliance, consultants can learn from previous trials and work in partnership with clinical study teams to design a robust and useful instrument.

The benefits of using ePRO are numerous, with improved speed, efficiency, higher compliance rates, and greater accuracy. However, there is still a change in culture needed among clinical study teams. This change will instigate the movement away from traditional and familiar paper-based instruments and toward ePRO technology. □

ity. What variables affect the patient's response to the instrument? Do the amount and visibility of questions and answers, seen by the patient during data collection, have a psychological impact on the answers given?

Many instrument authors tend to be in favor of a one question per screen approach to delivery, whilst others feel this changes the delivery of the instrument enough to affect validity. In some ways, the one question per screen approach may be superior: Many instruments assume independence between the answers given to individual questions, allowing for a more accurate assessment of inter-response correlation and variability. Easily allowing a patient to refer back to an earlier answer in the same instrument may call into question that assumption of independence.

However, if a patient must scroll through several pages to see all of the answer options, they may not answer as they would when confronted with all options laid out on paper. To counter that, the ease of use and modern interface of an ePRO instrument may encourage a tired and ill