

# Driving Value-Based Healthcare: Nordic Health Group's Approach to Implementing ICHOM Sets

## I. Introduction

### 1. Introduction to ICHOM

The International Consortium for Health Outcomes Measurement (ICHOM) is an international non-profit dedicated to the promotion and implementation of value-based healthcare (VBHC) by shifting the focus from volume of services to value achieved for patients. ICHOM was founded in 2012 by thought leaders in the healthcare sphere with the desire to use outcome measurement to implement the concepts underpinning VBHC and to act as a catalyst to drive the industry towards a value-based approach to healthcare delivery.

ICHOM's work focuses on the development of what are known as Sets of Patient-Centered Outcomes Measures ("Set"). Each Set represents a selection of outcomes, both patient-centered and clinical, that matter most to patients, as well as a number of other metrics which may impact said outcomes. A recommended timeline for the collection of this information is also defined, to standardize the measurement of outcomes globally. Individual Sets focus on one disease or condition specifically, to ensure that the outcomes related to that condition are adequately considered, and that patients living with the disease are appropriately represented. The Sets are defined by a committee of experts, known as the Working Group; experts include patient representatives and clinical experts in the field.

ICHOM Sets are used widely around the world and can be implemented in various ways, depending on the local context and needs. Throughout this paper, we will refer to implementation, which refers to the use of Sets in clinical practice, clinical research, academic research, patient advocacy work, and many other pathways.

### 2. Introduction to NHG

Nordic Healthcare Group ("NHG") is an advisory, insights and research company. Since 2004, NHG's over 200 professionals have worked with both public and private clients on over 4000

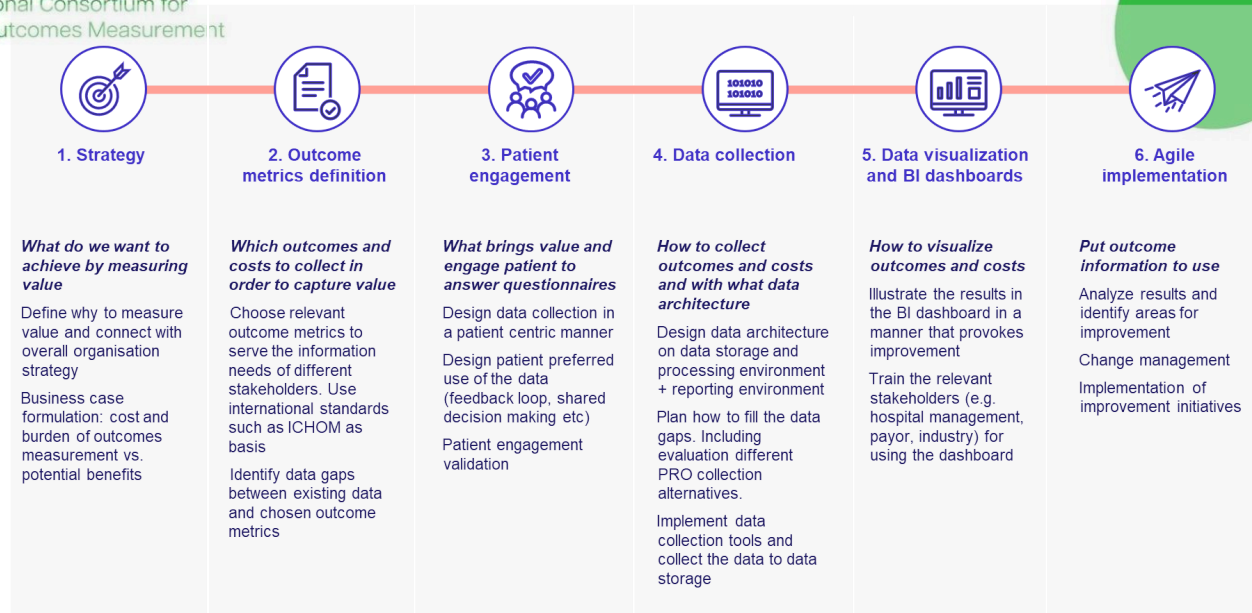
projects. NHG has deep expertise in value-based healthcare and ICHOM Sets of Patient-Centered Outcome Measures implementation.

NHG supports organizations in value-based healthcare implementations from vision and strategy to data collection, patient engagement, dashboard visualizations, benchmarking and continuous improvement. They have hands-on experience in supporting the implementation of multiple Patient-Centered Outcome Measures e.g.: stroke, coronary artery disease, prostate cancer, lung cancer, cataract and oral care.

## II. Nordic Health Group's approach to implementation

Since 2019, NHG has served as an ICHOM Implementation Partner, specializing in delivering comprehensive support for organizations seeking to integrate Value-Based Healthcare (VBHC) into their operations. As an official ICHOM Partner, NHG facilitates the adoption of ICHOM Sets, providing tailored assistance to streamline implementation, ensuring both efficiency and accuracy. This approach leverages insights derived from previous implementation experiences to optimize the process.

NHG has developed a structured implementation framework, encompassing a series of well-defined steps aimed at guiding clients through the VBHC adoption process. This framework begins with the formulation of a specific strategy tailored to the provider's objectives and culminates in full-scale implementation, wherein the data collected through ICHOM Sets is utilized to drive measurable improvements in healthcare outcomes. A more detailed description of these steps is outlined in the subsequent section.



## Step 1: Strategy → What do we want to achieve by measuring value?

This is a critical phase in the process, as it shapes and informs all subsequent steps. Understanding the rationale behind an organization's desire to measure outcomes is essential, as the intended use of the data will define the specific outcomes to be measured. For example, if the measurement is driven by a partnership with a pharmaceutical company aimed at generating evidence for treatment development, then specific variables, such as genetic profiling, might need to be incorporated. Conversely, if the objective is the healthcare provider's internal improvement, such as increasing the quality of care, the focus may shift toward ensuring that the data is visually represented in a way that is actionable for quality improvement initiatives.

The completeness\* of the implementation of an ICHOM Set, therefore, is contingent upon the intended application and goals of the outcomes measurement. For instance, if the Set is being used for global benchmarking, then it would be optimal to have data completeness of 100% or close to that. If the Set is being used for internal purposes, data completeness may vary. This variability may involve a reduced version of the Set, a different PROM tailored to the specific context, or additional variables not included in the original Set but necessary for the setting. It is important to recognize that the strictness or flexibility with which the Set is applied will significantly influence both the experience of outcomes measurement and the validity of the results generated.

In case there is hesitation or doubt as to whether this is an endeavor that is worth taking on and investing in, the development of a business case serves as a critical tool to

evaluate the associated benefits and costs, thereby facilitating an informed decision-making process. For example, it might be useful to develop a business case if implementation is being proposed within an organization as an initiative and a budget approval is required. However, in many cases, the development of a full business case has not been necessary, as organizations often have a clear understanding of the potential advantages associated with standardized outcomes measurement. The establishment of one or more use cases—defined by the strategic question, "What are the objectives of outcomes measurement?"—is crucial for guiding the direction of the initiative and determining how the resulting data will be utilized.

*\*Level of completeness refers to the percentage of the Set that is being used for routine outcomes measurement in any given organization; the highest level of completeness possible is always recommended by ICHOM in order to remain aligned with global standard of outcomes measurement for any given disease.*

## **Step 2: Outcomes metrics definition→ Which outcomes and costs to collect in order to capture value?**

Step 2 looks at the outcomes metrics definition to determine which outcomes and costs need to be measured in order to capture value. Costs may be included as well as outcomes in order to complete the VBHC equation. This is relevant because outcomes combined with costs will allow for a full “value” picture.

The initial step involves a comprehensive evaluation of the full ICHOM Set and the associated metrics it encompasses. Following this, the implementation team will assess the existing measurement practices within the organization. This evaluation, conducted by the NHG team, includes a thorough analysis of the information currently being collected, the sources and locations of the data, and the scope of patient populations included in the data collection process. This step aims to identify gaps, redundancies, and opportunities for alignment between the organization's current data collection practices and the standardized metrics defined in the ICHOM Set.

Identifying discrepancies between the data that is already collected and the metrics specified in the ICHOM Set is the first step. This comparison enables the implementers to pinpoint data gaps, thereby facilitating the determination of additional data requirements for comprehensive outcomes measurement. Based on this analysis, decisions can be made regarding which additional data variables need to be collected to align with the standardized metrics and achieve the desired objectives of the outcomes measurement process. As mentioned in the strategy phase, it may be necessary to add more variables in the form of outcomes or case-mix variables\*\* that need to be measured, depending on the specific objective of the project. For example, if this is

related to the development of a pharmaceutical product, anticipated outcomes associated with the drug may be added. This will not take away from the measures that are recommended by the ICHOM Set; it will only help to hone in on any specific objectives. The key challenge in many implementations is the availability of PROM data. The challenge is twofold: the technical challenge of implementation, and increasing and maintaining patient engagement. These challenges will be discussed in the section detailing steps 3 and 4.

Another issue is that there may be an associated fee for PROMs use and that the selected questionnaire must be validated. One way that this issue may be addressed for the public, non-profit sector, is the existence of fee exemptions, but this is often limited as some of the PROMs do not provide fee exemptions and can be costly. ICHOM is currently updating existing Sets to include adding recommendations of alternative PROMs to use when licensing fees render them inaccessible. However, this is still a work in progress and all Sets are not yet updated.

Measures around cost are not included in ICHOM Sets, and this is an area of specific interest for many providers as it defines return on investment and completes the equation of value-based healthcare. For cost measurement, NHG bases data collection on existing cost accounting systems, which is often through using claims data. This is not a fully accurate measure but allows a good enough estimate of the magnitude of cost of services, and is measured as total cost of an episode. Once a rough magnitude estimate of the full cost of any given disease for each patient can be estimated, then return on investment and cost-benefit can be measured more accurately. If more accurate information on cost is required, then time-driven activity-based costing (TDABC) can be utilized.

*\*\*Case-mix variables are factors specific to patients such as sociodemographics, treatment types and baseline health status, which influence and impact patient-reported and clinical outcomes.*

### **Step 3: Patient engagement → What brings value and engages the patient to answer questionnaires?**

Patient engagement should be an intentional goal when implementing Sets, as the objective is to provide value to patients. To achieve proper and full engagement, patients must perceive value in responding to the questionnaires. It is essential that patients are adequately informed about the purpose of administering questionnaires and the subsequent use of their responses by healthcare professionals. Similarly, response rates need to be high enough for aggregated data to be meaningful. Otherwise, benchmarking and comparison even internally will not be possible as the data may be skewed or insufficient for analysis.

While patient engagement and benefit are integral components of the VBHC model, these aspects can be overlooked in practice. NHG's approach focuses on evaluating whether patients are deriving value from the treatment they are receiving and whether this leads to improved health outcomes. This is achieved through a comprehensive assessment of patient participation, involvement, and, ultimately, benefit. Specifically, the evaluation considers how responding to the questionnaire influences the patient's experience, prognosis, education, or other relevant factors. It is imperative that responding to the questionnaire results in a positive change for patients—whether in terms of treatment effectiveness, care quality, or health outcomes—to justify the implementation of PROMs.

Since data collection about the patient experience is not typically part of routine practice in the clinical field, an initiative exclusively engaging health professionals may place less emphasis on this aspect or inadvertently overlook it. The questionnaires included in the Sets focus on the needs of patients and their perspective, taking into account what it is that matters to them when receiving any health service. Software serves as a bridge between clinicians and patients by presenting the data in a digestible and clear manner; it should be seen as a tool for broader outcomes measures implementation processes.

An example of these tools could be mobile applications that facilitate patients in reporting symptoms, tracking changes in their health status, uploading laboratory or imaging results, and completing PROMs questionnaires. Application could allow clinicians to review patient inputs in real time, enabling more direct and timely communication with patients through a two-way communication system. It serves as an integrated platform, fostering ongoing interaction between patients and healthcare providers.

The NHG team emphasizes that this step—integrating digital tools for continuous data collection and patient engagement—is crucial for the success of the implementation process. It ensures alignment with the overarching goals of VBHC, including enhanced patient participation, data accessibility, and improved clinical decision-making. By facilitating direct communication and real-time monitoring, this approach optimizes the effectiveness of outcomes measurement and supports the achievement of improved patient outcomes.

**Step 4: Outcomes collection → How to collect outcomes and costs, and with what data architecture?**



Integrating PROM tools into electronic medical records is the first step to be able to routinely implement ICHOM Sets. If the questionnaires are not directly included in the EMR, available for use and analysis for health professionals, their routine use in daily clinical practice will be limited and the evaluation of the data will be challenging.

Once the relevant data to be collected has been identified and structured in a manner that aligns with both patient needs and perspectives, as well as the broader objectives of the outcomes measurement framework, the next step is to establish the necessary data collection infrastructure. This infrastructure must ensure the efficient, accurate, and secure gathering of data while maintaining alignment with the intended goals of improving patient outcomes and supporting clinical decision-making.

There are various sources of data which are used; for example, EMRs, internal or external PROMs collection platforms, cost-accounting information, medication registries, diagnostic systems, and other sources alike. ICHOM currently offers IT-ready versions of the Sets which can be used in electronic systems within hospitals to collect information.

After localizing the source of the data, IT departments consolidate the information into a centralized location, typically within a data lake or an intermediate repository situated behind the hospital's firewalls. It is mandatory to ensure compliance with data protection regulations, such as the EU's General Data Protection Regulation (GDPR) or other relevant local data security laws, depending on the geographic region.

The next step involves validating the data to ensure completeness and to identify any significant gaps in the dataset. Data "cleaning" or transformation processes are then applied to ensure that the data is structured and formatted for optimal accessibility and usability. Once the data is adequately processed and structured, it can be visualized in a manner that is easily interpretable by stakeholders, ensuring that it is completely anonymized to preserve patient privacy. This process is essential for enabling data aggregation and generating a comprehensive overview of the collected information. It allows for comparative analysis of different treatment protocols, benchmarking across healthcare units, and the evaluation of trends over time, thus facilitating informed decision-making and supporting the overall goals of the outcomes measurement framework.

Presenting data to patients on an individual level is different. The PROMs collection platform typically has user-management processes where only the treating physician and patient can view the results of the patient; this is typically built-in to allow to see PROMs results.

## **Step 5: Data visualization and BI dashboards → How to visualize outcomes and costs**

Visualization of the data is typically accomplished through tools such as Power BI, although other platforms can also be employed. Ideally, data presentation is as actionable as possible, meaning it will be directly linked to the early step targets: what do we want to do with this data? This should be presented in a way that decisions can be made with the data. The visualisation of the data should be created with the objectives in mind, alongside making reading and interpretation as straightforward as possible.

ICHOM Sets include a large number of metrics so organizing these in a way that will be of use to clinicians and health professionals is key. NHG has created an outcomes index which summarizes the results of PROMs and clinical outcomes measures, and developed some adjustments for case-mix variables so the results can be seen both in raw form and adjusted. In order to do that, a calculation is made to evaluate how the different patient treatment variables and patient characteristics information correlate and forecast outcome results; based on this calculation, a simplified case-mix adjustment is made. In the past, this exercise has proven to identify a singular variable which is able to predict the best end-result of different outcomes. This is particularly useful to know for providers who are initially implementing an ICHOM Set and do not have the capacity to take on the entirety of the Set at once. This is also especially useful when benchmarking is being undertaken by various sites.



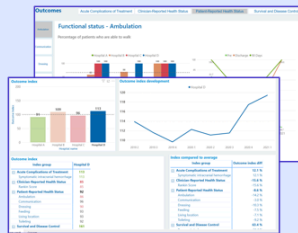
## SUMMARY VIEW

- Overall view of both outcomes and costs together
- Deviation analysis from the hospital average



## OUTCOMES VIEWS

- Development of NHG outcome index over time
- Outcomes index dimensions and difference to average
- Deep dive view on specific outcomes dimensions



## COST VIEW

- Total cost by care pathway step per hospital
- Possibility to deep dive to actual costs per patient



Several possibilities for filtering the results

NHG outcome index that combines different dimensions of ICHOM standard set

Possibility to case mix adjust the results



Overall view of both outcomes and costs

Deviation analysis that shows where a hospital is scoring well and room for improvement

Filtering options are also a key element of data visualization as it can help to analyse results and guide toward more efficient decision-making or inform patients on specific aspects of their clinical evolution. Filtering the data can help to differentiate between different subcategories in order to evaluate results from different angles or perspectives. For example, the data can be filtered by sociodemographic variables, treatment types, or specific outcomes. This can also help in benchmarking when comparing results

individually as opposed to benchmarking aggregated data. Additionally, dynamic dashboards can help to have a visual representation of the evolution of patients, as opposed to a static image of results at one time point. Finally, the layout presenting outcomes and costs side-by-side helps to visually represent the increase in value for patients and providers. Proper layout design can demonstrate efficiency, as well as improvements in performance and outcomes in a clear manner.

## **Step 6: Agile implementation → Put outcome information to use**

There are three main aspects which need to be taken into account when actively implementing an ICHOM Set, beyond data collection: use of data in clinical practice, integration of data into management, and finally, research outputs based on outcomes measurement.

Firstly, the data that has been collected must be used in clinical practice on a daily basis, not only as aggregated data. The data that is collected partly through ICHOM Sets must be readily available for clinicians and other health professionals to use, ideally by flowing directly into EMRs. Otherwise, it is unlikely to be used in routine clinical practice; separate and complicated software is likely to be dropped. The information provided by the data should relate to clinical insight and should add information to decision-making; it should not serve as a decision-making tool on its own. With time, the information can be used to inform decisions based on how other patients have responded or evolved with similar results, and can help the decision-making process between patients and health professionals. It is key to be able to see both individual and collective data, depending on the user.

One key aspect for this is being able to visualise results as aggregated data, and not only as individual patients.

Aggregated data should also be used for management by integrating it into multidisciplinary meetings, prioritising treatments, informing performance reviews and overall performance improvement. It is important to ensure that the information provided by the data is adequately used by the hospital management team as well as clinical teams, so that outcomes are integrated into management KPIs just as other management KPIs related to finances and productivity.

Finally, integrating data collection and results analysis into research programs within the institution highlights improvements in outcomes, demonstrates how these improvements were achieved (ideally in a replicable manner), and promotes the global adoption of outcomes measurement. Outcomes data can be used to conduct research within an institution; the most common way this is done is through clinician-led research on new

and existing treatments. Publishing findings from outcomes measurement would also ideally be a routine practice within teams that are implementing these Sets. Ultimately, agile implementation should ultimately increase value in care, notably by improving outcomes for the same cost, adopting benchmarking programs such as the ICHOM Learning Collaboratives or through internal measuring, and identifying and implementing best practices.

## IV. Conclusion

ICHOM Sets of Patient-Centered Outcome Measures are designed to enhance value in healthcare and improve patient outcomes by embedding patient-centered outcomes measurement into routine clinical practice. Nordic Healthcare Group aligns with this objective by providing guidance to healthcare providers navigating the transition to value-based healthcare, thereby promoting the adoption of outcomes measurement.

As demonstrated in this paper, the successful implementation of ICHOM Sets requires a systematic framework, dedicated personnel, and strategic planning. It is crucial to recognize that successful implementation involves factors beyond mere data collection, as the true value lies in how the collected data is utilized. A deep understanding of the healthcare setting in which the implementation occurs is vital, alongside active patient engagement in the outcomes data collection process to ensure meaningful results. Furthermore, presenting both individual and aggregated data in an accessible and actionable format is essential for its post-collection use.

The core of successful implementation resides in the use of the data by clinicians, with a particular focus on including patients in shared decision-making through the valuable insights captured by selected tools within the ICHOM Sets. In addition to the strategic and engagement efforts of healthcare professionals and patients, it is imperative to address the technical aspects of implementation, ranging from integration into EMRs to the use of advanced software that enhances data visualization and supports its evaluation.

Ultimately, the success of the implementation process can only be achieved if it is underpinned by a clear strategy and a purposeful aim to meaningfully improve patient outcomes in ways that are relevant and impactful to them. ICHOM Sets are the instruments designed to fulfill this objective, and NHG is committed to supporting healthcare professionals in optimizing the use of these Sets to achieve their full potential.