PsoPlus: an Integrated Practice Unit for Psoriasis

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ABSTRACT

There is a need to revise current healthcare organization due to the ever-rising costs and variation in quality of delivered care. Over the past decades there have been several strategic frameworks attempting to tackle this problem. Value-based healthcare (VBHC) is one those frameworks which has gained increasing popularity the last years. The framework is formulated on the premise that the healthcare sector should deliver integrated care, using integrated practice units (IPUs), and strive to maximize the value created. Value in this context is defined as the health outcomes achieved per costs made.

We have designed a lean IPU called PsoPlus in which psoriasis patients are managed by a multidisciplinary team which has all the expertise and skill to manage psoriasis and its associated conditions. In addition, we have developed and implemented guidelines for the management of psoriasis associated comorbidities enabling us to deliver integrated care in the Belgian healthcare setting. Finally, we have designed a supporting information technology platform, called PsoSmart, that brings data from patients and healthcare providers together and provides actionable insights for clinical decision making. The created value is documented and captured using a value-based outcome set. Cost assessments at the individual patient level are also performed.

To conclude, we describe here a comprehensive IPU setting for psoriasis which incorporates the VBHC principles. This IPU goes further and delivers a higher level of integrated care than other multidisciplinary psoriasis clinics. Monitoring outcomes and costs provides us with further insights to optimize psoriasis care. In addition, a software program designed to enhance psoriasis care is being developed further, however, advances in healthcare technology are needed.

LIST OF ABBREVIATIONS

- AI: Artificial Intelligence
- AMIA: American Medical Informatics Association
- CDSS: Clinical Decision Support System
- CRO: Clinician-reported Outcome
- EHR: Electronic Health Record
- GDPR: General Data Protection Regulation
- GP: General Practitioner
- HADS: Hospital Anxiety and Depression Scale
- HCP: Healthcare Professional
- IPU: Integrated Practice Unit
- ML: Machine Learning
- MVP: Minimum Viable Product
- PRO: Patient-reported Outcome
- PsA: Psoriatic Arthritis
- T2T: Treat-to-Target
- VBHC: Value-Based Healthcare
- VOS: Value-based Outcome Set
- QoL: Quality of Life

INTRODUCTION

With the publication of the book *Redefining Health Care: Creating Value-Based Competition on Results* in 2006, Michael E. Porter and Elizabeth O. Teisberg set in motion the concept of value-based healthcare (VBHC).[1] Value-based healthcare is a strategic framework aimed at tackling the ever-rising healthcare costs and variation in quality of delivered care, and has gained increasing popularity the last years. The framework is formulated on the premise that the healthcare sector should deliver integrated care and strive to maximize the value created. Value in this context is defined as the health outcomes achieved per costs made.[1] The following elements are essential to create a value-based system: 1) measure patient-relevant outcomes and associated costs; 2) openly report the achieved outcomes and costs to allow for continuous improvement (benchmarking); 3) organize integrated care using multidisciplinary teams; 4) develop an information technology platform that helps deliver integrated care and enable outcome measurement; and 5) develop innovative payment schemes to stimulate joint outcome responsibility and reward high-performing care providers accordingly.[1]

Psoriasis is a chronic inflammatory skin disease affecting over 40 million individuals worldwide.[2] Psoriasis is associated with numerous comorbidities and reduces quality of life (QoL) and life expectancy.[3–5] Furthermore, certain comorbidities, such as obesity, are known to exacerbate psoriasis and influence treatment dosing – highlighting the need for a multidisciplinary approach.[6] Recognizing psoriasis as a multisystem inflammatory disorder is therefore imperative to optimize its management.

To manage patients in a value-based manner there is need for a specialized care delivery chain in order to obtain the maximum value possible.[7] To create value for patients, care should be structured using an integrated practice unit (IPU) instead of being siloed in specialty departments.[7] An IPU is an organizational entity focused around a medical condition, over the full cycle of care, with a broad range of services delivered by dedicated multidisciplinary teams.[7] They include the full range of medical expertise, technical skills and specialized facilities needed to manage a specific disease.

We have set up an IPU in psoriasis called PsoPlus, referring to the added value we believe our approach brings to psoriasis management, at the Ghent University Hospital, Belgium (European Trade Mark registration, n° 018270708, since 21/11/2020).[8,9] The concept is not about narrow specialization, but about looking beyond the skin and pursuing full integrated care for psoriasis patients. In this paper we describe this IPU in detail to help support other initiatives.

DESIGN: APPLYING VBHC TO PSORIASIS MANAGEMENT

The PsoPlus clinic was set up end 2012 and earlier evaluations of this care delivery chain have previously been published.[8,9] Over the last years, the format has continuously evolved, with a major change as of 2019 where we introduced VBHC next to the continuous uptake of advancements in psoriasis management (e.g. new treatment options, appropriate dosing of biologicals). This approach is now considered to be standard of care for psoriasis at our department, and its major components will be discussed below.

MEASURING VALUE (OUTCOMES – COSTS)

In previous work we have defined a value-based outcome set (VOS) which can be used to document and capture the value healthcare professionals (HCPs) create in daily clinical practice.[10] This outcome set encompasses patient-reported outcomes (PROs) as well as clinician-reported outcomes (CROs).

Recently, we have started measuring and collecting these outcomes every 6 months for all our patients. These results are used for transparent comparative discussions amongst the HCPs and to induce periodic improvement cycles. Cost assessments at the individual patient level are also performed. In order to establish costs, each care pathway is mapped in detail and for each pathway the costs are calculated using time-driven activity based costing, which is the suggested costing method within the VBHC framework.[11]

PSORIASIS CARE DELIVERY

The overall flow that patients follow is depicted in Figure 1. Prior to attending the PsoPlus clinic, patients are contacted via email three weeks beforehand to fill out questionnaires and carry out assignments such as blood and or urine sampling (in the context of comorbidity screening). These requests are sent out online using a custom-made General Data Protection Regulation (GDPR) proof electronic patient platform, called PsoQuest. Patients are first seen by specialty-trained psoriasis nurses who perform the anamnesis and who are in constant contact with the dermatologists. The nurses take time to address lifestyle issues and/or psycho-social problems, and screen patients for comorbidities. Furthermore, they inquire about the patient's knowledge, preferences and beliefs about psoriasis and its treatment options to allow for shared decision making later on. Afterwards, patients are seen by a dermatologist specialized in psoriasis who does the clinical examination, commissions extra testing, assesses comorbidities and prescribes the appropriate treatment regimen, and summarizes the overall disease management approach. The dermatologist decides together with the patient on the ideal treatment, guided by the treat-to-target (T2T) paradigm (Fig. 1). The T2T was formed in collaboration with psoriasis experts throughout Belgium to reduce the disease burden as soon and as effective as possible and as such combat clinical inertia.[12] The T2T is also used to determine follow-up visits. The patient is referred to other specialists in case uncontrolled comorbidities are present. In terms of organization of the PsoPlus agenda, we employ several different consultation types (Table 1). By making use of simulation techniques, the optimal way of implementing these different types of consultations was analyzed - allowing for more efficient resource utilization by minimizing waiting times for patients and idle times for HCPs.

In between office visits, our PsoPlus team is accessible through PsoQuest which each individual patient can use to report on medication side effects, the occurrence of flares, and planned interventions such as surgery, vaccinations, or lack of medication prescriptions. Patient engagement beyond the office visit consists of virtual follow-up if needed. The level of engagement from the PsoPlus team will vary depending on the patient's needs and preferences, cascading the solution level from administrative team member, to nurse, or to dermatologist if needed.

DELIVERING INTEGRATED CARE AND GOING BEYOND THE SKIN

As mentioned previously, psoriasis should be considered a multisystem inflammatory disorder as it associated with multiple comorbidities. As such, there is need for a multidisciplinary approach.

Guidelines for comorbidity management

Several groups have tried to establish guidelines for the management of psoriasis associated comorbidities.[13–15] However, because healthcare systems are structured differently across the globe these guidelines may not be feasible in every country. Therefore, based on the previous work provided by these groups, additional literature, and after consulting experts of our university hospital

in the respective fields, we designed and implemented guidelines for screening and management of the classical comorbidities associated with psoriasis – the comorbidities most frequently cited as associated with psoriasis and those that are most relevant for the dermatologist in the clinical setting. These guidelines can be used when managing psoriasis patients in Belgium and provide guidance to which specialist patients should be referred to (these guidelines can be found in the Supplementary Materials). Patients are screened every 6 months and laboratory test are performed annually, unless otherwise indicated. Patients are referred if needed and during follow-up it is controlled whether appropriate treatment was initiated and whether the comorbidity is under control. If not controlled, the corresponding specialist or general practitioner (GP) is contacted again to ensure follow-up.

The PsoPlus hub and spoke model

In case of psoriasis, not all comorbidities are equally prevalent nor have an equally important impact. We therefore believed that a specialist for the most prevalent and impactful comorbidities; psoriatic arthritis (PsA), weight problems and mental health problems, should be easily accessible for patients – in the physical IPU rather than the virtual IPU (which includes all services provided throughout the cycle of care). Therefore, we have a dedicated rapid access PsA consultation for all of our patients with a suspicion of PsA or known PsA with a rheumatologist once a week. Patients with high hospital anxiety and depression scale (HADS) scores (≥ 8 for each domain) or patients who themselves request a consultation are seen by our psychologist. This psychologist is familiar with the psychosocial impact of psoriasis and has experience in dealing with chronic disease challenges. The psychologist can also help patients deal with stress and can also refer them to stress management sessions. Finally, during every consultation there is a nutritionist on the floor for an intake consultation for patients struggling with overweight/obesity. Afterwards, they can be referred to a dietician in their hometown or referred for further follow-up within our hospital. For the less frequent comorbidities we have collaborations with other departments in our hospital so that patients are referred faster. We also have regular monthly interdisciplinary case meetings between rheumatologists, dermatologists and gastroenterologist to discuss challenging clinical cases. Overall, the dermatologist takes the leading role in psoriasis case management in which he coordinates the care (Fig. 2).

As mentioned previously, we also formed affiliations with HCPs outside of our hospital. The specialists of our IPU also give regular presentations, via webinars or live meetings, to GPs and other HCPs thereby increasing their knowledge about psoriasis as well as creating awareness of the broader impact of psoriasis. Finally, our team has close connections with local patient organizations, such as the Flemish Psoriasis League, thereby being an integrated part of the local psoriasis community.

DATA CAPTURING

A transition to a VBHC approach requires a detailed information technology platform.[7] This also becomes evident when considering the aforementioned amount of data that needs to be captured. The right system can help the different parts of an IPU work with together, enable outcome measurement and allow for new reimbursement approaches. There are six requirements for such a platform: 1) it should be centered around the patient; 2) it should use common data definitions; 3) it should encompass all types of patient data; 4) it should be accessible to all parties involved in the patient's care; 5) the system should include templates and expert systems for each medical condition and finally; 6) data should be easily extracted, analyzed, and visualized.[7] We have designed such an integrated platform, called PsoSmart, that brings data from patients and HCPs together and provides actionable insights for clinical decision making (Fig. 3).

PsoSmart should be seen as the overarching name for the integration of different subunits of software consisting of:

PsoQuest

PsoQuest was developed by our team in collaboration with the hospital's ICT department and Philips VitalHealth (QuestManager software). This platform is designed to enhance patients' compliance and comfort. There are several tablets connected to PsoQuest in the waiting room which can be used by the patient to fill out questionnaires or watch videos.

Functions accessible via the platform from the patient's perspective:

- Filling out questionnaires (e.g. the VOS and comorbidity screening)
- Addressing questions, in a secure manner, directly to the PsoPlus team
- Booking a PsoPlus type consultation
- Watching educational videos – PsoLearn modules (these videos explain the rationale behind PsoPlus and provide additional information about psoriasis and its treatments in digestible "chunks")

Functions accessible via the platform from the HCP's perspective:

- Real-time visualization of outcomes (e.g. of questionnaires) on individual patient level
- Answering patients' questions

PsoMonitor

PsoMonitor incorporates the data retrieved from PsoQuest and the additional data that is collected by the HCPs during the consultations. Extensive data regarding patient, disease as well as treatment characteristics are collected in a structured way (dermatology format can be found in the Supplementary Materials). The rationale for these was previously covered and is in line with a recent German expert consensus on what data should be documented in routine care.[8,16] PsoMonitor also collects data needed to calculate the T2T score. Lab results as well as letters to, for instance, other specialists are all stored and generated in this system. As such, PsoMonitor is the digital system that forms the central hub around our patients. Currently, the electronic health record (EHR) of our hospital takes on the role of PsoMonitor, however, in the future a more workable software system is needed. This new system needs to support all HCPs working around the patient, thereby crossing the boundaries of the hospital to facilitate information sharing and follow-up. Moreover, the burden of EHR documentation has also caused different sets of problems in healthcare (e.g. reduced patient-clinician interaction) and therefore there is need for simple and easy documentation.[17] Innovations to the EHR system with less "click burden" for physicians have the potential to streamline health information and improve user friendliness as shown by a case study by Guo et al.[18] As such, this new system should be easy to use and require as less clicks as possible. Finally, the system should be capable of automatically measuring the time of each PsoPlus care pathway as this is needed to calculate the costs.

PsoCarepath

Currently, the development of PsoCarepath is still ongoing. PsoCarepath will be an advanced clinical decision support system (CDSS) that guides HCPs in the clinical care pathways - patients follow a streamlined care algorithm based on the characteristics of their psoriasis. These care pathways are elaborate and continue in time since psoriasis is a life-long condition. Clinical decision support systems are often classified as knowledge-based or non-knowledge based.[19] Knowledge-based systems use

pre-set rules to produce an action or output. These rules can be made based on e.g. literature or guidelines. In contrast to knowledge-based systems, non-knowledge based systems base their decisions by learning with e.g. artificial intelligence (AI) rather than being programmed. PsoCarepath will use both CDSS types. A practical example of this in psoriasis would be to alert a HCP when he wants to prescribe methotrexate to a patient who wants to become pregnant. Other examples include indicating when patients need to be screened for comorbidities or when their next consultation should be scheduled based on the T2T (to avoid unnecessary testing and too frequent consultations). Furthermore, CDSS could use our recently developed BETA-PSO guideline and aid in choosing the best systemic treatment for each individual patients.[20,21] Clinical decision support systems could also aid in therapeutic drug monitoring by telling HCPs when to adjust (up- or down-dose) biological administration regimens based on serum trough levels and therapeutic windows. However, when using AI in solving clinical problems, the clinical data must first be carefully labelled and curated as any inaccuracy in labelling will severely limit the accuracy attainable by the algorithm. As such, this is only possible with the aforementioned extensive and standardized data registry in PsoMonitor.

PsoAnalytics

This is the data warehouse where all data is stored and easily accessed. This system allows the data to be accessed to e.g. show patients their evolution compared to subpopulations, or during team meetings to discuss complex patients. More importantly, it serves as a data lake in which data is easily extracted for use in studies and publications. Data is aggregated on meta as well as on a group or individual level.

DISCUSSION

An IPU represents a fundamental part of the implementation of a value-based approach. Here, we have further designed and implemented an IPU for psoriasis disease management according to the VBHC principles. The dermatologist takes a leading role in a broad multidisciplinary team which has all the expertise and skill to manage psoriasis and its associated conditions. Furthermore, we use an integrated information platform that captures outcomes and costs, and that guides us in clinical decision making.

Evaluating outcomes and holding transparent comparative discussions about them allows us to improve the care we deliver as was shown in the Martini Klinik, one of the world's most highly specialized prostate clinics.[22] They have drastically improved care for prostate cancer and complication rates (i.e. incontinence and impotence) following prostate surgery are consistently lower than the national German average.[22] Furthermore, delivering integrated care using combined dermatology–rheumatology psoriasis clinics has shown to improve outcomes as well as patient and physician satisfaction.[23] Queiro et al. described three types of combined dermatology–rheumatology psoriasis clinics in Spain; *face-to-face* (the specialists have joint consultations), *parallel* (the specialists see the patients sequently), and *preferential circuit* (this type is more similar to usual clinical care in which specialists have their own agendas at their own department with the addition that there is a close collaboration between the specialties).[24] We have opted for the parallel type, instead of joint consultations, when addressing impactful comorbidities as not all patients have the same comorbidities or needs and as such it would be unnecessary that each specialist sees each patients in depth. Patient scheduling problems, which are often a challenge in combined psoriasis clinics, are therefore also kept to a minimum.[23] For the less frequent comorbidities we have opted for preferential circuits. One could argue that cardiologists would form an integral part of the

management seeing the high prevalence and impact of cardiovascular comorbidities. However, we opted for collaborations with GPs as to use resources in a more sustainable manner – constantly consulting cardiologists would lead to high costs. In addition, this setting is also more convenient for the patient as they often have a long-standing relationship with their GP who is often also more accessible and easily located for the patient. Specialty-trained nurses are also key in our IPU as they take over certain tasks (e.g. informing patients on treatment options and addressing lifestyle issues) that would normally be performed by dermatologists, allowing dermatologists to dedicate greater time to clinical aspects. Specialty-trained nurses can play an important role in psoriasis management as they do in atopic dermatitis.[25] It is apparent that this IPU goes further and delivers a higher level of integrated care than other multidisciplinary psoriasis clinics. Moreover, by employing several consultation types scheduling of different types of patients was optimized. In addition, by making specific consultations nurse-led the volume of patients that can be seen is increased and waiting times reduced. Patient-initiated care consultations allow for further flexibility and can be implemented in clinical practice safely and effectively, whilst having the possibility to reduce costs.[26] Continuity of care is guaranteed by utilizing these different consultation types as well as PsoQuest. Finally, health literacy has been shown to influence treatment adherence in psoriasis patients, with higher overall health literacy being associated with better adherence.[27] For instance, a recent study has shown that knowledge about COVID-19 may influence therapy discontinuation, e.g. COVID-19-related information on preventive measures was a protective factor for biologics dosage modification.[28] Improving health literacy by properly educating patients on the disease and its treatments as well as being easily accessible for patients' questions, as we try to do via our IPU, may therefore have the possibility to improve treatment adherence and thus outcomes.

Quality of care is known to suffer when the patterns of care delivery are widely divergent.[29] Therefore, adoption of technology platforms, specifically using CDSS to monitor and ensure guideline-specific care, is crucial. Clinical decision support systems have already shown to improve care and reduce costs.[19] Furthermore, AI can augment the capability of HCPs by taking over tasks that are more routine or standardized, thereby freeing up time so that HCPs can focus more on their patients.[30] In our case, further research is needed to develop a minimum viable product (MVP) of PsoSmart – a product version with just enough features to be usable by early customers who can then provide feedback for further development. We see here the opportunity to optimize psoriasis management using AI, with focus on machine learning (ML). Currently, in psoriasis, ML has mostly been used in scoring of disease severity and less in disease management according to the review of Yu et al.[31] As such, there is still much work to be done regarding the implementation of ML in psoriasis management and we believe that the MVP of PsoSmart could aid in this. In the future, genetic predictors and biomarkers can also be incorporated into this system which will bring us closer to precision medicine in psoriasis. Precision medicine has the potential to further drastically change psoriasis management, improve outcomes, and even reduce costs.[32] We have encountered several hurdles of which the price of such a platform and the acceptability regarding data storage/accessibility within a hospital, remain the main obstacles. The American Medical Informatics Association (AMIA) EHR-2020 taskforce suggested that legislation regarding such platforms should be simplified as to allow easier development and deployment of such platforms in healthcare.[17] Moreover, there still remain technical and ethical issues when implementing ML in healthcare delivery.[30] As this field is expanding rapidly, hopefully, in the near future some of these issues can be resolved.

Some concerns remain when working in a VBHC manner. Firstly, setting up extensive collaborations within a hospital as well as beyond remains complicated with the current siloed specialty departments. Secondly, in Belgium a fee-for-service payment system remains the standard and as such all HCPs in our IPU are reimbursed by the services rendered to each patient (volume-based). In addition, several

described services (e.g. teleconsultations, license costs of PsoSmart) are currently not or only partially reimbursed in Belgium making this IPU less sustainable outside of an university setting where external funding is limited. Thirdly, this way of working also requires a culture shift from the patient's side in which they play a bigger role in their own care, which may be challenging. For instance, routinely assessing PROs in dialysis patients (another chronic condition) yielded only low response rates, although large variations between centers existed.[33] If similar response rates would be obtained in psoriasis care, regularly assessing value, which largely consists of PROs, may pose a challenge. Finally, working in this way will likely bring along a substantial amount of costs and currently it is unknown if these costs can be justified. Although a systematic review studying the impact of integrated care models for chronic diseases (type 2 diabetes mellitus, schizophrenia, and multiple sclerosis) showed a positive economic impact, combined psoriasis clinics have often shown to be cost-inefficient.[23,34] By utilizing specialty-trained nurses, employing the parallel and preferential circuit types, and by implementing different consultation types, we hope to partially contain our costs. However, the cost-effectiveness of our screening strategy remains to be seen. Several groups have recommend annual or biannual screening for comorbidities depending on psoriasis severity.[14,15] We have opted for a more strict approach in which we screen all our patients every 6 months, regardless of severity. For PsA this can be justified as it has been shown that a diagnostic delay of as little as 6 months is associated with the development of peripheral joint erosions and worse long-term outcomes.[35] For other comorbidities biannual screening may be to excessive as e.g. the United States Preventive Services Task Force only recommends annual screening for hypertension in high-risk individuals.[36]

The results of working in this IPU will be further assessed by the upcoming IRIS (value In psoRiasIS) trial (ClinicalTrials.gov, NCT05480917). This trial intends to initiate on this forward-looking reality check and will provide us with additional insights regarding further optimization of this IPU and psoriasis care in general. Optimizing psoriasis management will require evaluation of interventions, improving resource allocation, and support of patients and providers.

CONCLUSION

We describe here a comprehensive IPU setting for psoriasis, called PsoPlus, which incorporates the VBHC principles. Research is ongoing to validate this approach and provide us with further insights to optimize psoriasis care. In addition, a software program designed to enhance psoriasis care is being developed further, however, advances in healthcare technology are needed.

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Statement of Ethics

Ethical approval was not required because this study does not include patient/participant data.

Conflict of Interest Statement

No potential competing interests were reported by the authors.

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Author Contributions

Dr Hilhorst, Ms Deprez and prof Lambert had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Hilhorst, Deprez, Lambert.

Acquisition, analysis, or interpretation of data: Hilhorst, Deprez, Lambert, Hoorens, Roman, Borzée, De Beule, Dullaers.

Drafting of the manuscript: Hilhorst, Deprez.

Critical revision of the manuscript for important intellectual content: Hilhorst, Deprez, Lambert, Hoorens, Roman, Borzée, De Beule, Dullaers.

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Administrative, technical, or material support: Hilhorst, Deprez.

Supervision: Lambert.

Data Availability Statement

All data generated or analyzed during this study are included in this article and its supplementary material files. Further enquiries can be directed to the corresponding author.

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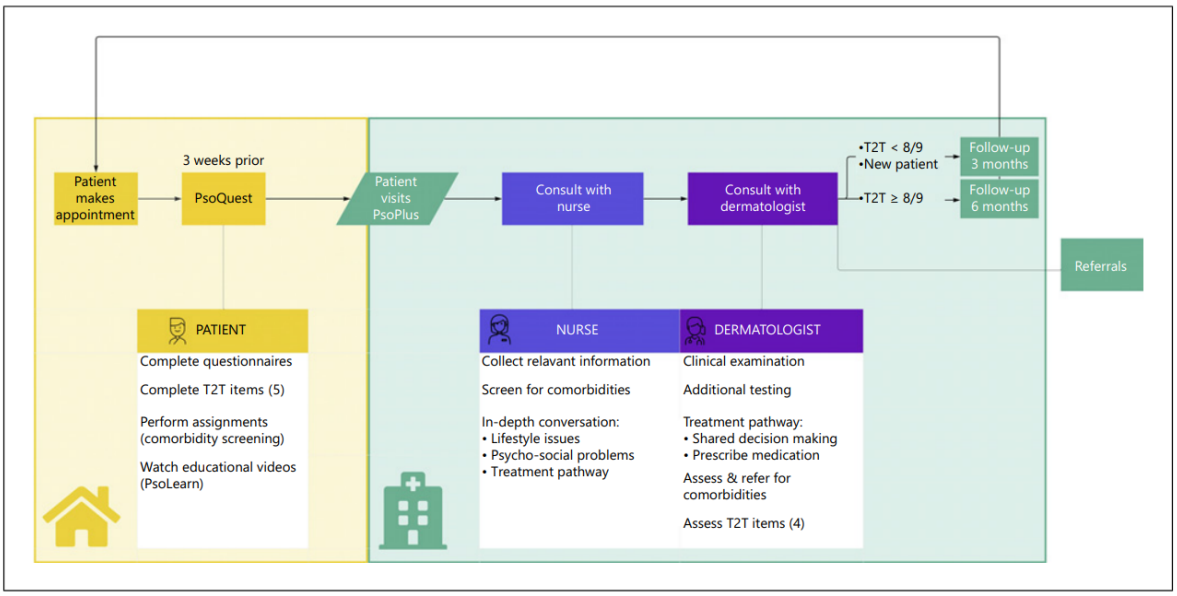

Figure 1. Overall flow of the PsoPlus

Patients make an appointment to attend our psoriasis clinic. Prior to attending the PsoPlus, patients are contacted via email three weeks beforehand to fill out questionnaires and carry out assignments such as blood and or urine sampling (in the context of comorbidity screening). When patients attend the hospital, they are first seen by a specialty-trained psoriasis nurse who performs the anamnesis and screens for comorbidities. The nurse takes time to address lifestyle issues and/or psycho-social problems, and discusses the different treatment pathways. Afterwards, patients are seen by a dermatologist who does the clinical examination, commissions extra testing, assesses comorbidities and prescribes the appropriate treatment regimen, and summarizes the overall disease management approach. The dermatologist decides together with the patient on the ideal treatment. The patient is referred to other specialists in case uncontrolled comorbidities are present. The T2T paradigm, consisting of 9 items which are both reported on by the patient as well as the dermatologist, is used to decide when to switch/adapt treatment and determine follow-up visits.

T2T: Treat-to-target

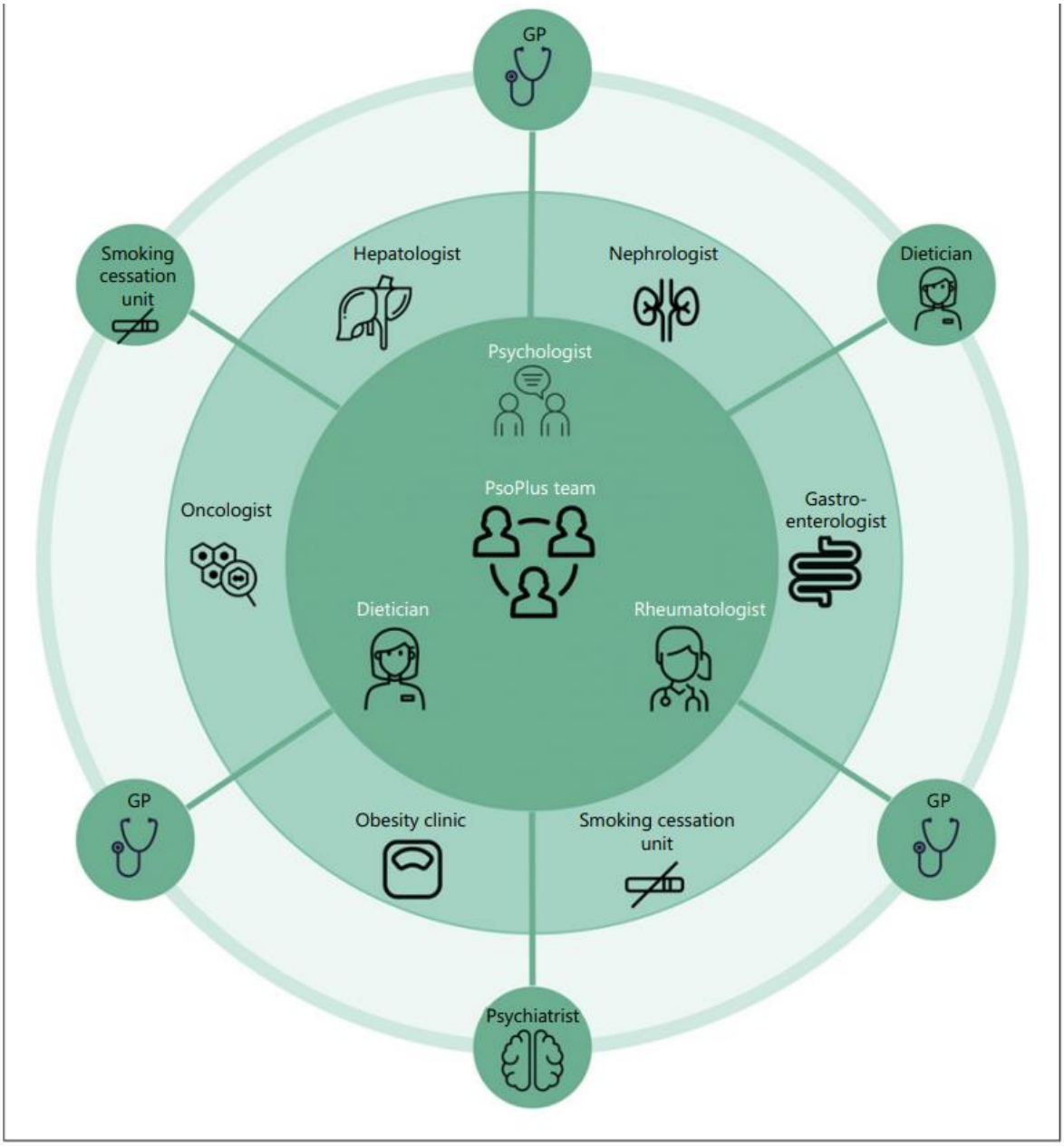

Figure 2. PsoPlus hub-and-spoke model

The PsoPlus team together with a rheumatologist, psychologist and a dietician form the inner core of the IPU. They work closely together when managing psoriasis patients. For the other comorbidities we have collaborations with other departments in our hospital so that patients are referred faster (middle ring). Finally, we also have affiliations with GPs and other healthcare professionals outside of our hospital as shown by the outer ring in the figure.

GP: General Physician
IPU: Integrated Practice Unit

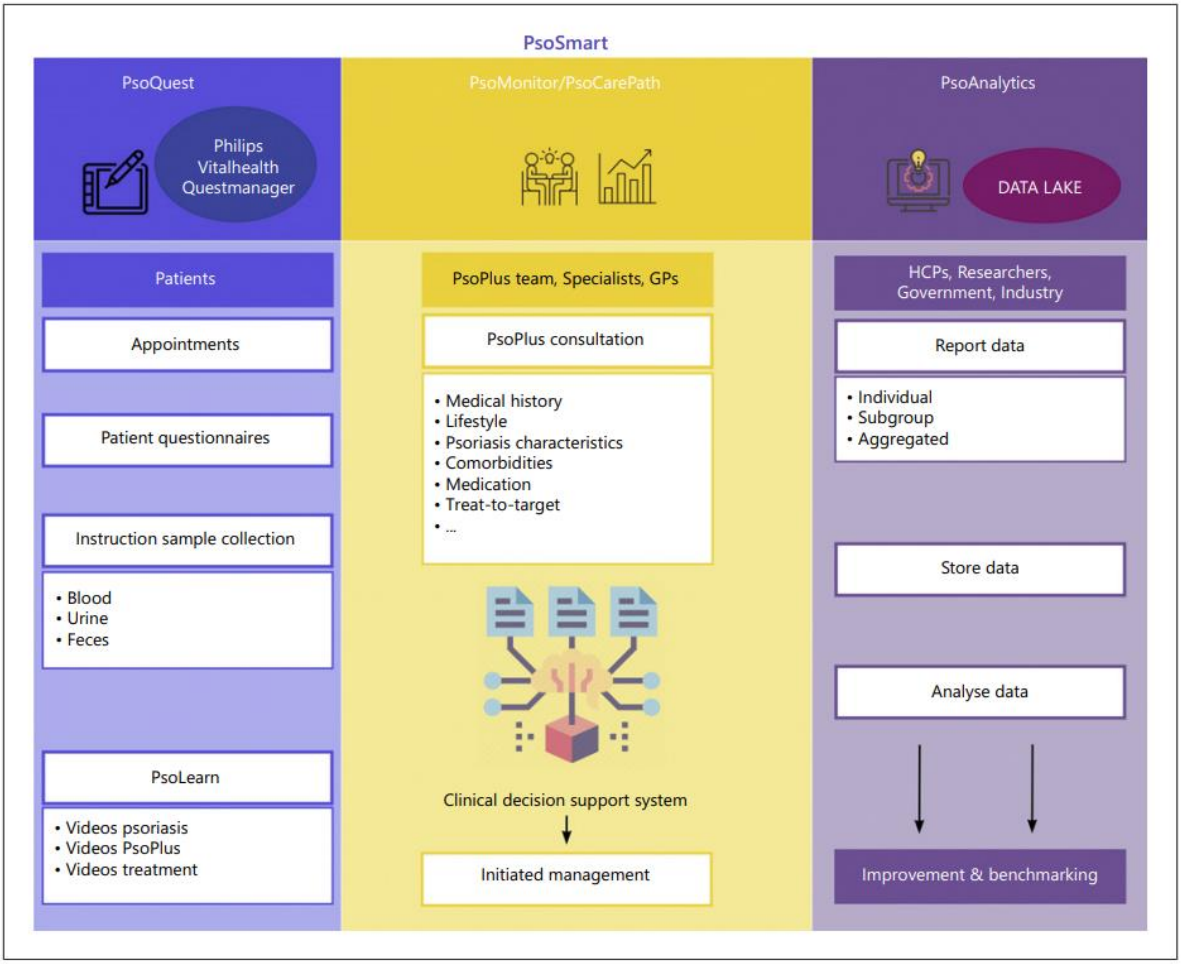

Figure 3. Overview of the data capturing system called PsoSmart

PsoSmart should be seen as the overarching name for the integration of different subunits of software consisting of:

1. **PsoQuest:** is a specially designed secure patient platform which allows for interaction between the patients and the PsoPlus team. Via questionnaires, data regarding outcomes and comorbidity screening are collected. Appointments can also be made using this platform. PsoQuest was developed by our team in collaboration with the hospital's ICT department and Philips Healthcare.
2. **PsoMonitor/PsoCarepath:** incorporates the data retrieved from PsoQuest and the demographic and clinical data that is collected during the consultations in a safe, user-friendly and complete manner. PsoCarepath is an advanced clinical decision support system that guides healthcare professionals in the clinical care algorithm: patients follow a streamlined care pathway based on the characteristics of their psoriasis.
3. **PsoAnalytics:** offers data storage, analysis and reporting. It serves as a data lake in which data can be easily extracted for use in studies and publications. Data is aggregated on meta as well as on a group and individual level. This data can be used to induce periodic improvement cycles and allow for benchmarking between different centers.

GP: General Physician
HCP: Healthcare Professional