During this symposium, results from a randomized controlled trial investigating the effect of smartphone based electronic self-monitoring on the severity of depressive and manic symptoms will be presented and discussed.
Further, we will present and discuss the use of automatically generated objective smartphone data on behavioral activities (e.g. social activities, mobility and physical activity) as electronic biomarkers of illness activity in bipolar disorder.
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**S46**

## Value-based healthcare delivery in the digital era

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*Introduction* Mental disorders are a major cause of disability in Europe [1]. However, organizational structures and information systems are focused on delivery of care, rather than providing value [2]. In the digital era, we have the capacity to change priorities through the analysis of heterogeneous databases that could support patients' and professionals' decisions.
*Objectives* to analyse the contradictions between the design and the theoretical structure of mental health services and the possibilities to evaluate the actual value of the delivered care.
*Aims* To reflect on changing the trend using a different conceptualization of objectives and evaluating methods.
*Methods* We used a tool provided to clinicians by the Madrid's Regional Health Service SERMAS ('ConsultaWeb') combining primary care, pharmacy and hospital data ($n$ = 395,073 patients for the catchment area), and a set of hospital-based data (patients attended by psychiatrists at the ER, $n$ = 13,877, and patients admitted to the Psychiatric Inpatient unit $n$ = 3318), to explore some of the present professional information resources.
*Results* Currently used healthcare databases only describe the diagnostic or therapeutic categories of patients and might be used to detect abnormal behaviours. However, they are neither able to show the functional status of patients nor designed to predict their clinical course.
*Conclusions* A clearer definition of value in patient outcomes is needed. This might help to organize the healthcare delivery and to create a new information system that would allow to asses health outcomes.
*Disclosure of interest* The authors have not supplied their declaration of competing interest.
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**S47**

## New platform of data analytics for mental health

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*Introduction* Mental disorder is a key public health challenge and a leading cause of disability-adjusted life years (DALYs) due to its high level of disability and mortality. Therefore, a slight improvement on mental care provision and management could generate solid benefits on relieving the social burden of mental diseases.
*Objectives* This paper presents a long-term vision of strategic collaboration between Fujitsu Laboratories, Fujitsu Spain, and Hospital Clinico San Carlos to generate value through predictive and preventive medicine improving healthcare outcomes for every clinical area, benefiting managers, clinicians, and patients.
*Aims* The aim is to enable a data analytic approach towards a value-based healthcare system via health informatics. The project generates knowledge from heterogeneous data sources to obtain patterns assisting clinical decision-making.
*Methods* This project leverages a data analytic platform named HIKARI ("light" in Japanese) to deliver the "right" information, to the "right" people, at the "right" time. HIKARI consists of a data-driven and evidence-based Decision Support and Recommendation System (DSRS), facilitating identification of patterns in large-scale hospital and open data sets and linking data from different sources and types.
*Results* Using multiple, heterogeneous data sets, HIKARI detects correlations from retrospective data and would facilitate early intervention when signs and symptoms prompt immediate actions. HIKARI also analyses resource consumption patterns and suggests better resource allocation, using real-world data.
*Conclusions* With the advance of ICT, especially data-intensive computing paradigm, approaches mixing individual risk assessment and environmental conditions become increasingly available. As a key tool, HIKARI DSRS can assist clinicians in the daily management of mental disorders.
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# Is schizophrenia a disorder of brain connectivity?

**S48**

## Disintegration of sensorimotor brain networks in schizophrenia

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A large body of literature reported widespread structural and functional abnormalities throughout the brain in schizophrenia spectrum disorders (SZ). Corresponding with the typical symptomatology in SZ where sensory dysfunctions contribute to the core social and cognitive impairment, converging evidence suggests a disturbed interplay between higher-order (cognitive) and lower-order (sensory) regions. This talk will discuss the results of several recent studies, investigating brain connectivity in SZ using functional magnetic resonance imaging data from large samples. Within-network sensorimotor as well as sensorimotor-thalamic aberrations in SZ robustly appear among the core findings across studies, both during performance of cognitive tasks and during rest. We utilized machine learning to distinguish SZ from healthy controls based on connectivity profiles. When classifying on sensorimotor connections alone, not only can we reach accuracies largely above chance but also, these accuracies are as good as when incorporating whole brain connectivity in the classification. Whereas the overall accuracy levels in distinguishing SZ from controls are not useful in a clinical context, these results underline the robustness of the sensorimotor findings on the individual subject level. Targeting the sensory and perceptual domains may thus be key for

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future research to get a better understanding of the heterogeneity of clinical manifestations in severe mental disorders and to map clinical symptoms to imaging phenotypes.
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**S49**

## Fronto-thalamic dysconnectivity and cognitive control in schizophrenia

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*Introduction* Several lines of evidence suggest that cognitive deficits represent a core feature of schizophrenia.
*Objectives* The concept of "cognitive dysmetria" has been introduced to characterize disintegration at the system level of frontal-thalamic-cerebellar circuitry which has been regarded as a key network for a wide range of neuropsychological symptoms in schizophrenia.
*Aims* The present multimodal study aimed at investigating effective and structural connectivity of the frontal-thalamic circuitry in schizophrenia.
*Methods* Univariate fMRI data analysis and effective connectivity analysis using dynamic causal modeling (DCM) were combined to examine cognitive control processes in 40 patients with schizophrenia and 40 matched healthy controls. BOLD signal and parameters of effective connectivity were related to parameters of corresponding white matter integrity assessed with diffusion tensor imaging (DTI).
*Results* In the DTI analysis, significantly decreased fractional anisotropy (FA) was detected in patients in the right anterior limb of the internal capsule (ALIC), the right thalamus and the right corpus callosum. During Stroop task performance patients demonstrated significantly lower activation relative to healthy controls in a predominantly right lateralized frontal-thalamic-cerebellar network. An abnormal effective connectivity was observed in the right lateralized connections between thalamus, anterior cingulate and dorsolateral prefrontal cortex. FA in the right ALIC was significantly correlated with the fronto-thalamic BOLD signal, effective connectivity and cognitive performance in patients.
*Conclusions* Present data provide evidence for the notion of a structural and functional defect in the prefrontal-thalamic-cerebellar circuitry, which seems to be the basis of the cognitive control deficits in schizophrenia.
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**S50**

## Motor symptoms and altered connectivity in schizophrenia

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Schizophrenia spectrum disorders are frequently associated with motor abnormalities. Aberrant motor function can be observed in patients throughout the course of the disorder, in subjects at high clinical risk and in unaffected first-degree relatives. Schizophrenia is further characterized by white matter abnormalities in multiple fiber tracts and aberrant resting state cerebral perfusion. In a series of studies, we investigated the association of objectively measured motor behavior in terms of activity levels with white matter microstructure and cerebral perfusion at rest. Patients were less active than controls at the behavioral level. In the associations with neuroimaging techniques, we detected that unlike controls, patients' activity levels were linked to structure and perfusion of cortical motor areas as well as the connecting white matter. In controls instead, motor activity relied on the association of cortico-subcortical motor loops. Thus, some of the motor signs in schizophrenia may result from ineffective coupling between cortical and subcortical motor areas. Finally, preliminary data from functional connectivity analyses support this notion.
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# Lifespan development of schizophrenia and how the treatments improve outcome

**S51**

## Antipsychotic medication and outcomes in schizophrenia from a lifespan perspective

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*Introduction* Antipsychotic medications play an important role in schizophrenia, and their efficacy in the relapse prevention and treatment of acute psychotic symptoms is clear-cut.
*Objectives* Data on the long-term use of antipsychotics and impact on prognostic issues is limited, although some previous studies noted a high risk of relapse during the first two years after the first acute psychosis.
*Aims* Our aim was to study the characteristics and clinical course of medicated and unmedicated schizophrenia patients.
*Methods* The study population consisted of schizophrenia patients from the Northern Finland 1966 Birth Cohort ($n = 70$). Use of antipsychotics was examined in the follow-up interview by asking about the subjects' medication history during the previous three months. The sample was divided into a non-medicated group ($n = 24$) and a medicated group ($n = 46$).
*Results* Relapses during the follow-up were equally frequent between non-medicated and medicated subjects (47% vs. 53%). Not having been hospitalised during previous five years, but not previous two years, before the interview predicted long-term successful antipsychotic withdrawal without relapse. Fifteen of the subjects in the non-medicated group (63%) and 9 in the medicated group (20%) were in remission.
*Conclusions* The present results imply that there are some individuals with schizophrenic psychoses not using antipsychotic medication whose psychotic illness and clinical course are so favourable that they do not necessarily need medication permanently. Changes in the antipsychotic dosing should not be made too fast and the patient and relatives should be able to contact without delay if exacerbation of psychotic symptoms is suspected.
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