

VISUALISATION OF THE SERVICE USE FOR INDIVIDUAL CLIENTS WITH A PERSONALITY DISORDER AT DEVON PARTNERSHIP TRUST TO SUPPORT CLINICAL DECISION MAKING

Kerry Pearn^{1*}, Sean Manzi¹, Lindsay Winterton²

*k.pearn@exeter.ac.uk ¹NIHR CLAHRC South West Peninsula (PenCLAHRC), University of Exeter Medical School, UK, ²Devon Partnership NHS Trust, National Health Service, UK

Background

In England, clients with a personality disorder (PD) accessing mental health services do not follow a predefined linear care pathway as there are multiple access points and multiple service interfaces. As a result, clients are allocated one of a large number of services available to them at any one time. As they progress through their treatment, it becomes increasingly important to track their service use history, as clinicians need to understand their past treatment to inform future decisions. This is particularly important to avoid cyclic pathways, where clients are transferred back and forth between services without clinicians identifying a care pathway that is suitable for them.

In Devon (county in South West England) the mental health services are provided by Devon Partnership Trust (DPT). Currently, access to client's service use history takes place within a third party software: Carenotes, in the format displayed in Fig. 1 Panel A. This interface displays top level data masking important details (e.g. duration, type and order of services accessed) making it difficult to ascertain an overview of the client's service use history. Currently clinicians must expend valuable time and energy to extract the relevant information to inform clinical decisions. Improving data display to include clinically relevant information can lead to improved clinical decision making and improved care provision to clients. Here we present Service Use Timelines (SUT): a decision support tool that improves the visualisation of the routinely collected service use data. This tool was produced in collaboration with DPT and will be implemented within mental health services.

Development process

Development of SUT was based on reported techniques to visualise temporal data¹, guiding a design that provides clear visualisations (as timelines) of individual client's service use from routinely collected data available in Carenotes. The initial SUT design was developed on Carenotes data for any client diagnosed with a PD (ICD-10 diagnostic code F60-F61, or a care cluster 7 & 8) recorded between 01-01-2015 and 18-02-2018. This dataset contained fields including ward/team, date stamps and classification of services. Feedback from four separate consultations with DPT staff (e.g. clinicians, nurses, managers and administration), helped identify which data to include and how best to display. An example of the final result is displayed in Fig. 1 Panel B, where features that are currently supported by data collected in Carenotes are displayed alongside those that were requested, but that are not currently available in Carenotes (**).

Visualisation of an individual client's service use

Carenotes (current visualisation)

Date	Form	Summary
25/04/2018	Ward Stay	Ward 5 - Closed (25/04/2018 09:14)
16/02/2018	Discharge Administration Form	Admission Date - 18/01/2018
09/02/2018	Ward Stay	Ward 5 - Closed (25/04/2018 09:14)
09/02/2018	Ward Stay	Ward 5 - Closed (09/02/2018 15:55)
23/01/2018	Discharge Administration Form	Admission Date - 18/01/2018
21/01/2018	Ward Stay	Ward 5 - Closed (09/02/2018 15:52)
19/01/2018	Allocated Staff	25/04/2018 - Staff 7, Role description, Ward 5
19/01/2018	Allocated Staff	25/04/2018 - Staff 6, Role description, Ward 5
18/01/2018	Ward Stay	Ward 5 - Closed (21/01/2018 22:13)
18/01/2018	Inpatient Episode	25/04/2018 Discharged - Ward 4
08/12/2016	Team Episode	14/02/2017 Discharged - Ward 4
22/11/2016	Allocated Staff	Current - Staff 4, Role description
14/11/2016	Allocated Staff	24/11/2016 - Staff 5, Role description
23/11/2015	Team Episode	Accepted - Ward 3
23/11/2015	Allocated Staff	14/11/2016 - Staff 4, Role description
07/10/2015	Ward Stay	Ward 2 - Closed (23/11/2015 11:30)
15/07/2015	Allocated Staff	01/12/2015 - Staff 3, Role description
26/06/2015	Allocated Staff	23/11/2015 - Staff 2, Role description
25/06/2015	Allocated Staff	30/07/2015 - Staff 1, Role description
19/06/2015	Team Episode	01/12/2015 Discharged - Ward 1

Service Use Timelines (proposed visualisation)

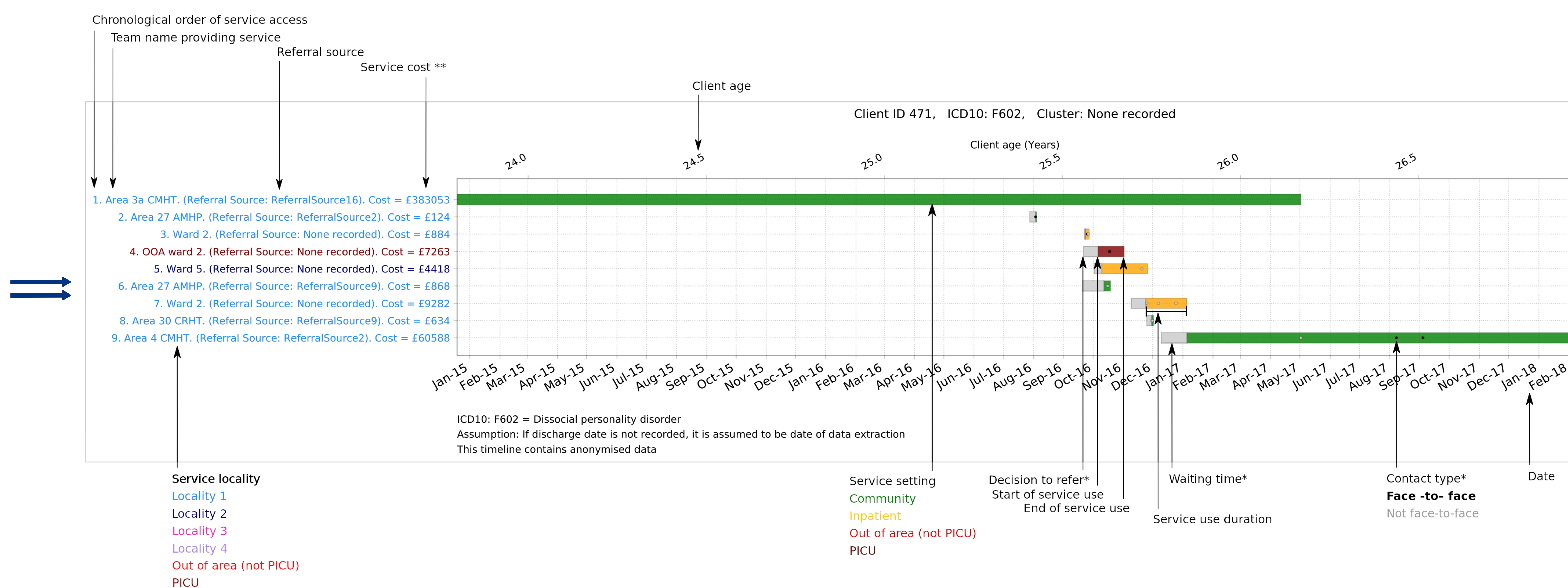


Fig. 1 Panel A. Screen shot of the Carenotes display showing an anonymised individual client's service use. This is the current way clinicians (making clinical decisions about personality disorder clients) can view client service use data.

Fig. 1 Panel B. Service Use Timeline for an anonymised individual personality disorder client's service use, using data routinely recorded in Carenotes (* & ** indicate where surrogate data have been used to show proof of concept: * data recorded in Carenotes but were not included in the original data request; ** data not yet recorded in Carenotes).

Application

SUT capture and deliver service use information in an easily accessible format, thus **reduces the cognitive load** for the clinician and **provides cognitive capacity** for clinical decisions. This has the potential to save resources by:

- (1) reducing time spent by clinician to understand the data²;
- (2) improving data understanding and recall²; and
- (3) improving the clinical decision making thus improving the client's treatment plan.

Using the SUT during consultations with clients can aid discussion, and help explore previous service use that did not have the desired outcome (to prevent cyclic pathways).

Future work

SUT, a visual support tool, has received a positive response from clinicians, and plans are in place for DPT to electronically embed the SUT within DUNDAS BMI (a business intelligence tool developed and maintained internally by DPT, which is linked to and displays up-to-date Carenotes data). Discussions are ongoing to tailor the SUT to the need of the clinicians, including recording additional information in Carenotes. As DPT internally manage DUNDAS BMI, this allows for the SUT to be updated as required to meet the

needs of the clinicians, rather than having to deal with barriers when using third party software. The information displayed in SUT is only limited by the data recorded in Carenotes, the flexibility of the software and the developer's availability. The advantages offered by the SUT is not restricted to PD clients, hence SUT will be available for all mental health clients accessing DPT services. Future work is necessary to assess the impact of introducing these SUT to mental health service clinical decision making, and to understand if these translate into a real benefit for PD clients.

References

1. S.B. Cousins and M.G. Kahn, 1991. "The visual display of temporal information". *Artificial intelligence in medicine*, 3(6), pp.341-357.
2. D.L. Alonso, A. Rose, C. Plaisant and K. L. Norman, 1998. "Viewing personal history records: A comparison of tabular format and graphical presentation using lifelines". *Behaviour and Information Technology*, 17(5), pp. 249-262.

Acknowledgements

We thank Simon Wellesley-Miller and the DPT Informatics Team for the provision and knowledge of the Carenotes dataset.

This work was funded by Devon Partnership NHS Trust

This research was supported by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care South West Peninsula (NIHR CLAHRC South West Peninsula). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health and Social Care.