

Dialysis Device Interoperability

Kidney Health Initiative, June 24, 2021

Presented by Dialysis Device Interoperability Consortium

Device Standardization Consortium

- ▶ Partnered Market Leaders in Hemodialysis Products & Services
- ▶ Initiated and Managed by DaVita for Device Standardization
- ▶ Contributing Service Partners
 - ▶ DaVita Kidney Care
 - ▶ Fresenius Medical Care
 - ▶ Dialysis Clinic, Inc.
- ▶ Contributing Vendor Partners
 - ▶ Fresenius Medical Care
 - ▶ NxStage
 - ▶ Baxter
 - ▶ B Braun Medical
 - ▶ Medtronic

Dialysis Device Interoperability Standards



Interoperability Definition

- ▶ The ability of two or more systems or components to exchange information and to use the information that has been exchanged. (*IEEE Computer Dictionary, 1990*)
- ▶ To enable interoperable exchange and interpretation of data, the dialysis machine and medical record systems must:
 - ▶ Have a common set of exchange **profiles**
 - ▶ Have ability to read and write the same file formats
 - ▶ Use a **standardized** communication protocol
- ▶ **Profiles**, such as the *HL7 Dialysis Machine Implementation Guide*, impose constraints for specific use cases to simplify implementation and testing.
- ▶ **Standards** provide a method that is economically effective by amortizing the cost of the design, implementation and integration over many system pairs. Without standards, everything is a custom integration.

Benefits of Device Interoperability

- ▶ Connect health IT and dialysis machines
- ▶ Improve patient safety, care quality and outcomes
- ▶ Increase clinical efficiencies, usability and workflow
- ▶ Improve information flow

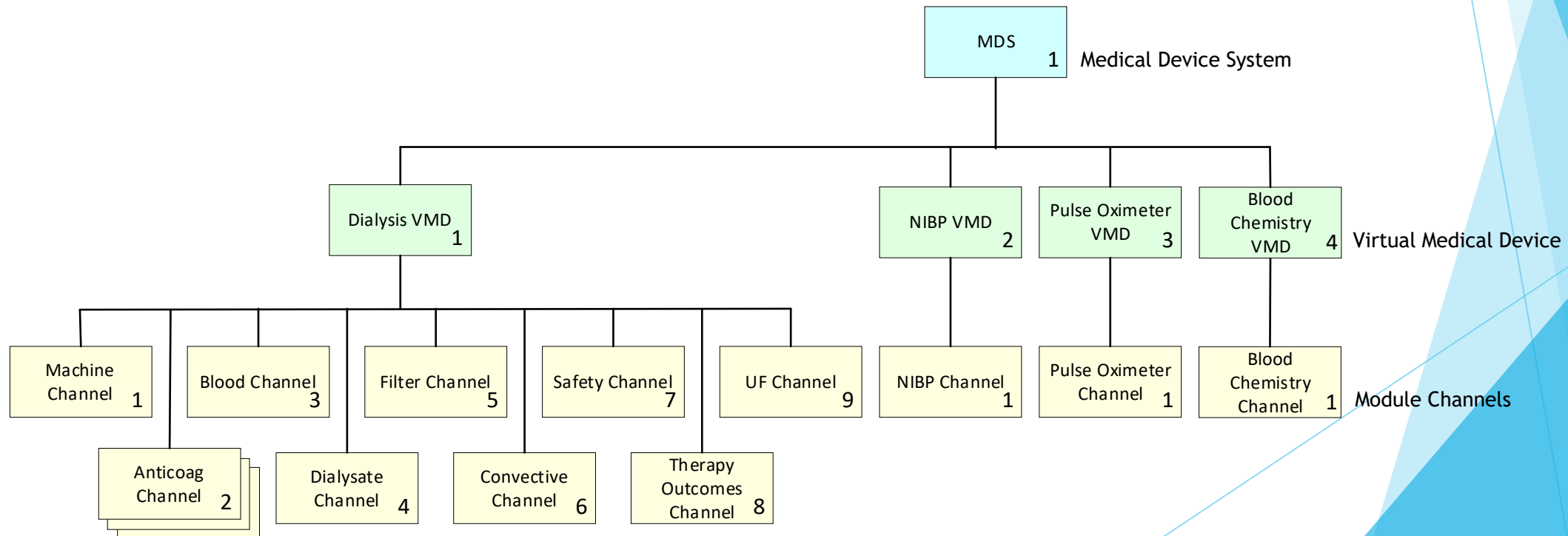
- Need to bolster content if this is the slide we are going to use to convince Nephrologist to use this standard
- DaVita originally asked for this standard - can we work original reasons into this?
 - Follow up with Mahesh?
- Duane to also look at bolstering content

Same Communication Protocol

- ▶ **HL7 Guidelines - *Dialysis Machine Implementation Guide***
 - ▶ Follows **Integrating the Healthcare Enterprise Patient Care Device (IHE PCD) Technical Framework**, using HL7 V2 messaging and IEEE 11073 nomenclature
 - ▶ Provide applicable set of data definitions and structures
 - ▶ Adopt as worldwide industry standard
 - ▶ Eliminate need for proprietary solutions for dialysis healthcare interoperability
 - ▶ Focus on electronic reporting of device treatment data from a dialysis machine to an EHR/EMR for hemodialysis therapies
 - ▶ Include patient info, treatment system readings, thresholds, and alarms generated during machine usage
 - ▶ Currently does NOT include peritoneal dialysis or prescription from EHR/EMR to the dialysis machine

Common Set of Device Data

- ▶ Machine Channel - Model, Manufacturer, S/N, etc.
- ▶ Blood Channel - BFR, Arterial Pressure, Venous Pressure, etc.
- ▶ Dialysate Channel - DFR, Conductivity, Concentrate, etc.



Common Set of Data Formats

▶ IEEE Nomenclature Standards

- ▶ IEEE Reference ID, Alert Type, Common Name, Unit of Measure, List of Options, Option Definitions, etc.

Dialysis Machine Data Standard: IEEE 11073 identifiers and containment

REFID	AlertType	CommonTerm	UOM_UCUM	Enum_Values	Enum_Descriptions
.. MDC_DEV_HDIALY_BLOOD_PUMP_CHAN					
... MDC_HDIALY_BLD_PUMP_BLOOD_FLOW_RATE		Actual Blood Flow Rate	mL/min	.	.
... MDC_HDIALY_BLD_PUMP_BLOOD_FLOW_RATE_SETTING		Blood Flow Rate Setting	mL/min	.	.
... MDC_HDIALY_BLD_PUMP_BLOOD_FLOW_RATE_MEAN		Average Blood Flow Rate	mL/min	.	.
... MDC_HDIALY_BLD_PRESS_ART	phys tech high low thr	Arterial Pressure	mm[Hg]	.	.
... MDC_HDIALY_BLD_PUMP_MODE		Blood Pump Mode	--	2N	Double Needles – Separate needles/catheter lumens for arterial and venous blood flow
				1N1P	Single Needle/Single Pumps – The same needle/catheter lumen used for both arterial and venous blood flow, blood flow controlled by one pump
				1N2P	Single Needle/Double Pumps – The same needle/catheter lumen used for both arterial and venous blood flow, blood flow controlled by two pumps
... MDC_HDIALY_BLD_PUMP_TUBING_SIZE		Blood Tubing Size	--	.	.

Next Steps

- ▶ Commercialize IEEE 11073 Dialysis Device Standards and HL7 Dialysis Machine Implementation Guide
- ▶ Continued Dialysis Device Standardization
 - ▶ Prescription Import
 - ▶ Define Data Objects
 - ▶ Append IEEE Nomenclature
 - ▶ Update Dialysis Device Specialization HL7 Guidelines
 - ▶ Peritoneal Dialysis
 - ▶ Results Export
 - ▶ Prescription Import

Questions

Interoperability



HL7 Guideline

IEEE Standards

Next Steps

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