



U.S. Food and Drug Administration  
Protecting and Promoting Public Health

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# ESRD as a Preference Sensitive Condition

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Food and Drug Administration

**December 8, 2017**





# Outline

- End Stage Renal Disease (ESRD)  
Background
- What makes ESRD preference sensitive?

# ESRD Background

- Pathophysiology
  - Kidney “function” < ~10% of normal
  - Accumulation of toxins and fluid normally excreted by the kidney
- Symptoms / Signs
  - Fatigue, confusion, altered sleep, nausea, vomiting, shortness of breath, fluid retention, altered taste, malnutrition, itching, etc.
- Treatments
  - Dialysis: Hemodialysis / Peritoneal Dialysis
  - Transplantation

# ESRD Treatments

- Hemodialysis (HD) – 87.3%
  - Most common / default
  - Blood removed from body, filtered, and returned
  - Typically 3x / week in a clinic (in home HD ~1.8%)
- Peritoneal Dialysis (PD) – 9.6%
  - Fluid added to abdomen; fluid saturated with toxins; fluid removed and replaced; cycle repeated several times daily
  - Therapy typically delivered in the home
- Renal Transplantation (Txp) – 2.5%
  - Best available therapy / replaces native kidney function
  - Shortage of available organs
  - Surgery / Drugs required to suppress immune system

# “Preference Sensitive”

**Patient Preference Information –  
Voluntary Submission, Review in  
Premarket Approval Applications,  
Humanitarian Device Exemption  
Applications, and *De Novo* Requests,  
and Inclusion in Decision Summaries  
and Device Labeling**

**Guidance for Industry, Food and  
Drug Administration Staff, and  
Other Stakeholders**

Document issued on August 24, 2016.  
This document will be in effect as of October 23, 2016.

The draft of this document was issued on May 18, 2015.

For questions about this document regarding CDRH-regulated devices, contact the Office of the Center Director (CDRH) at 301-796-5900 or Anindita Saha at 301-796-2537 ([Anindita.Saha@fda.hhs.gov](mailto:Anindita.Saha@fda.hhs.gov)).

For questions about this document regarding CBER-regulated devices, contact the Office of Communication, Outreach, and Development (OCOD) at 1-800-835-4709 or 240-402-8010.



U.S. Department of Health and Human Services  
Food and Drug Administration

Center for Devices and Radiological Health

Center for Biologics Evaluation and Research

- “multiple treatment options exist and there is no option that is clearly superior for all patients”
- “when the evidence supporting one option over others is considerably uncertain or variable”
- “patients’ views about the most important benefits and acceptable risks of a technology vary considerably within a population, or differ from those of healthcare professionals.”



# ESRD / HD Background

- Most patients with ESRD receive hemodialysis (HD) in a clinic setting
- In-clinic HD therapy can be inconvenient
  - Requires travel to a clinic 3 times every week.
  - Much of the patient's time is spent traveling, waiting, receiving the HD treatment, and recovering.
  - Difficult to work or travel.
  - Intense dietary and fluid restrictions.
- Strategies to increase convenience (e.g., home HD) require benefit/risk trade-offs -> preference sensitive

# Home HD Trade-off (examples)

## Benefits / Pros

- Increased therapy options (e.g., extended, nocturnal, frequent)
  - Less diet/fluid restrictions
  - Fewer medications
  - Shorter recovery time
- Increased flexibility with treatment schedule
- Increased ability to work or travel

## Risks / Cons

- Increased responsibility
- Lack of trained medical personnel
- Increased burden on family / care partners
- Need for dedicated space for treatment / supplies
- Social isolation from (ESRD Community)

# ESRD Treatment / Preferences

## Preference Sensitivity

In Clinic HD



[www.merit.com](http://www.merit.com)

Home HD



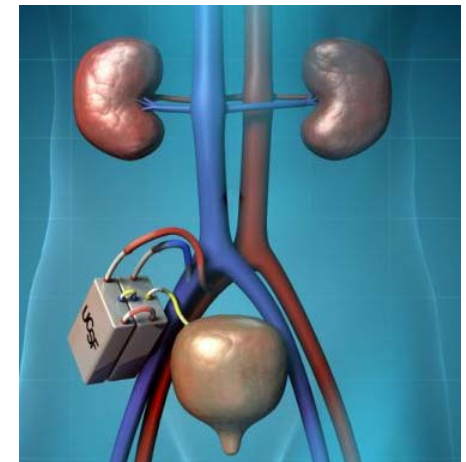
[www.nxstage.com](http://www.nxstage.com)

Wearable HD



[www.nanodialysis.nl](http://www.nanodialysis.nl)

Implant



<https://pharm.ucsf.edu/kidney>



# Preferences / Novel Technologies



- ESRD Patient preferences data available
  - home HD, PD, and blood access for HD.
- Patient preferences around novel technologies (wearable / implantable) are largely unknown.
- Patient preferences around novel technologies will be important for regulatory approval and labeling.
- How do we obtain patient preferences for this preference sensitive area?
  - Kidney Health Initiative
    - Partner with patients and other experts to further explore preferences around novel therapies

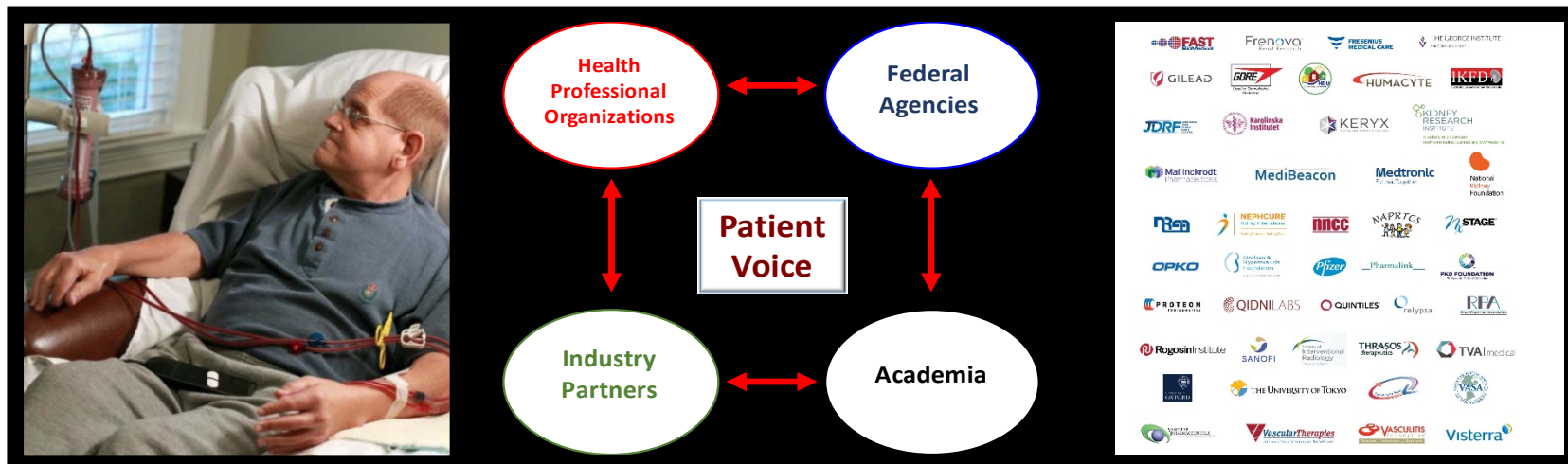
Thank You!



KIDNEY HEALTH INITIATIVE

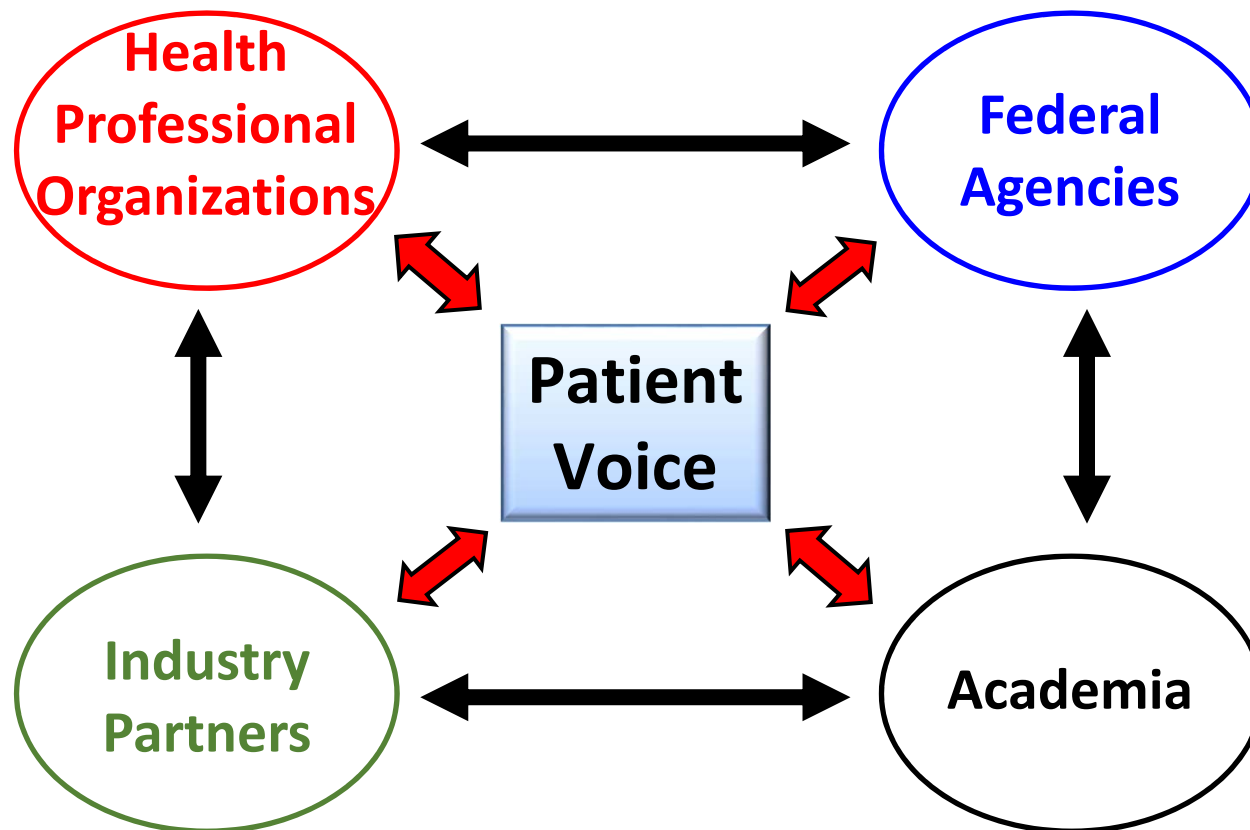
# Patient Partnership Perspective: Kidney Health Initiative:

Melissa West  
Project Director, Kidney Health Initiative



# How do we put the patient voice front and center in the context of therapeutic product development?

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# There is still much to do...

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- Patients become true partners in the product development process
- Develop an infrastructure which allows patients to actively participate at every stage of the **product development pathway**

# Kidney Health Initiative

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- **Public Private Partnership between the FDA and ASN**
- **Formed in September 2012**
- **Goal of promoting innovation and patient safety in kidney disease**

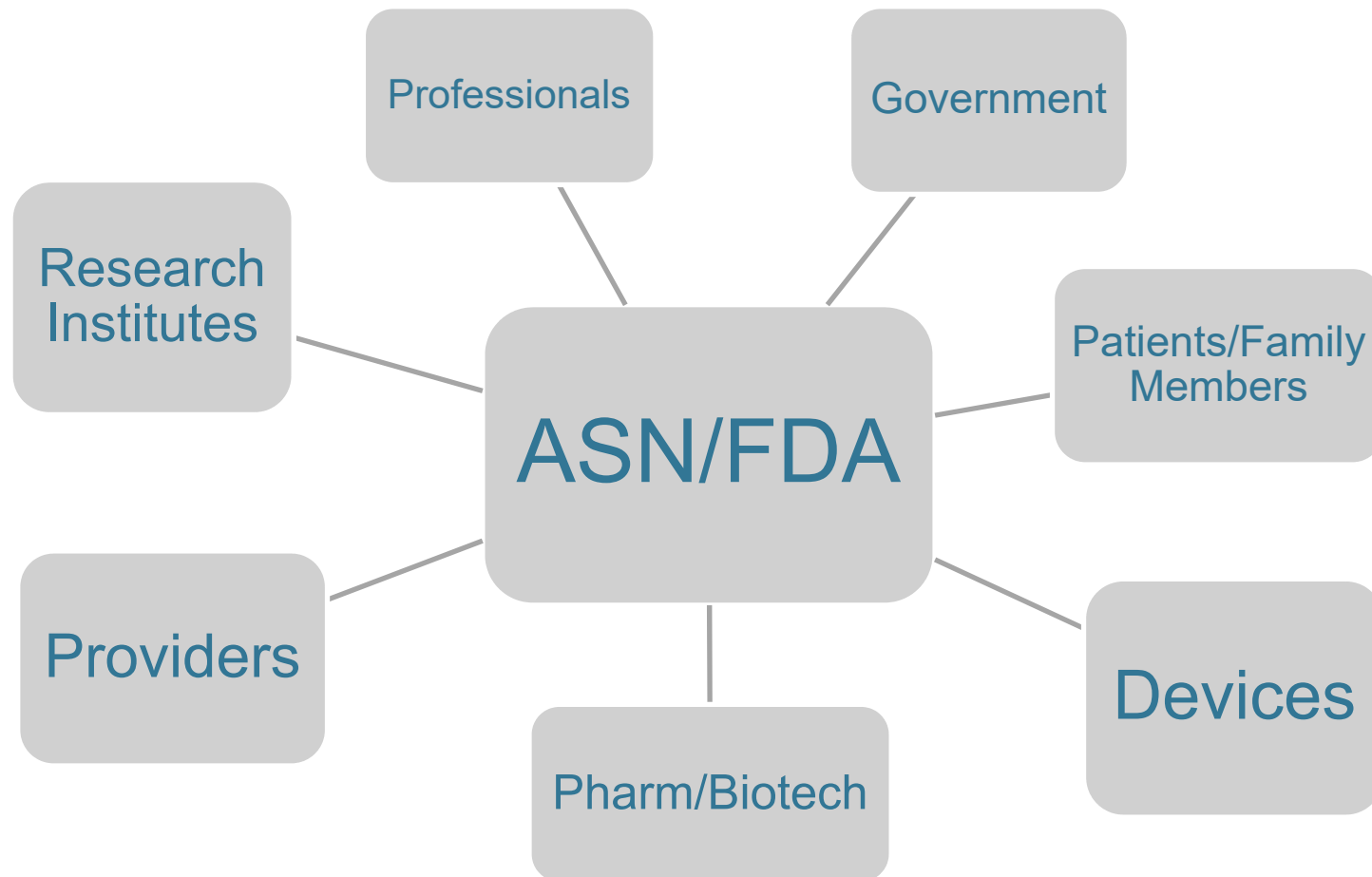


# Multi-disciplinary collaboration of over 80 organizations



# KHI is a collaborative effort

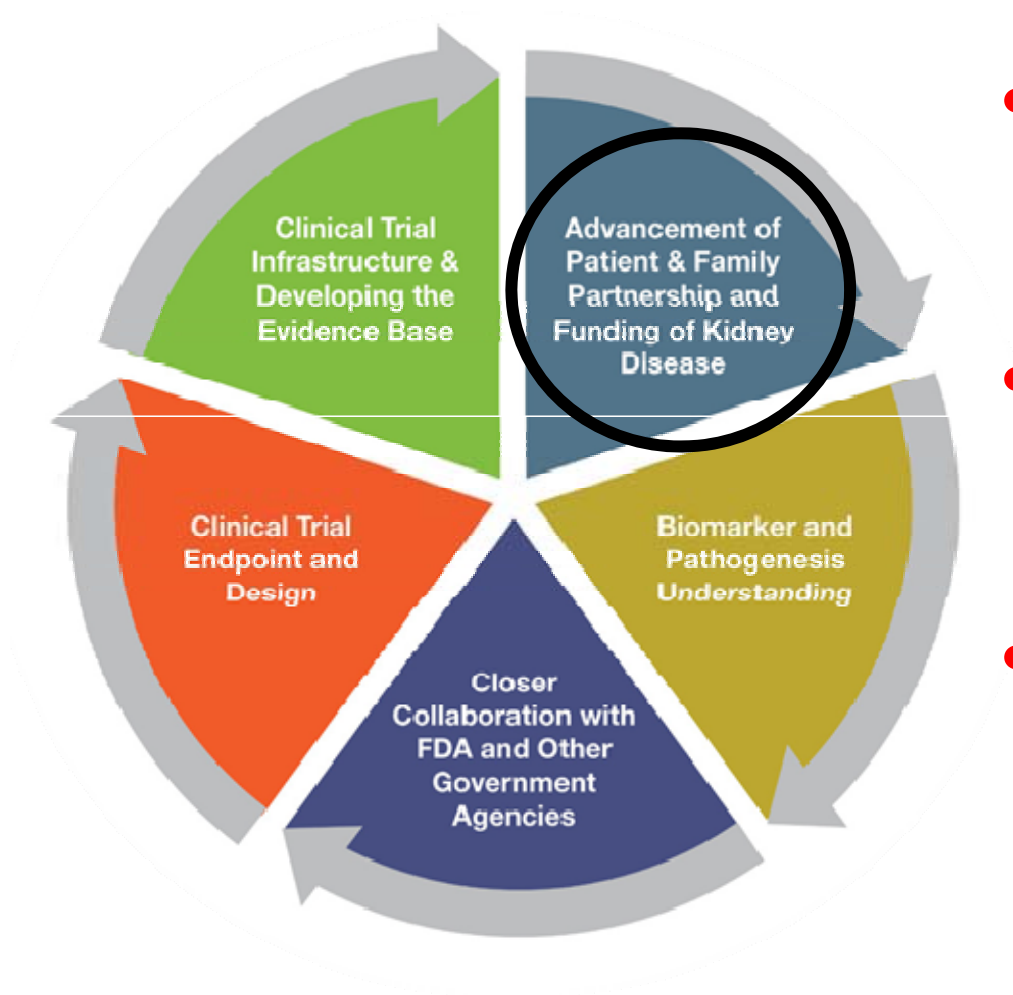
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# Making an impact: projects in strategic priority areas

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- White papers, data standards, workshops or a roadmap
- Facilitate the passage of drugs, devices and biologics into the kidney area
- Over 15 projects to date

# KHI Patient and Family Partnership Council

## Current members of the KHI PFPC:

David M. White, *Chair*

Kevin J. Fowler, *Vice Chair*

Pamela M. Duquette

Denise Eilers, BSN, RN

Richard D. Fissel

Nichole M. Jefferson

Terry F. Litchfield

Roberta L. Wager, MSN, RN

Caroline Wilkie



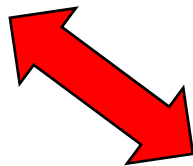
# KHI Patient and Family Partnership Council

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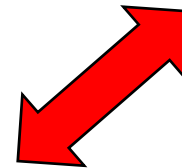
**Help KHI engage and network** with other patients and patient organizations across the spectrum of kidney disease



**Advise industry and research partners** of the needs and preferences of patients to consider as they develop new products



**Identify patients** willing to participate in KHI workgroups and projects



# Workshop: Patient Perspective on Medical Device Development

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- Patient's tolerance for "risk on hemodialysis" varies tremendously
- Patients on home hemodialysis may sacrifice some degree of safety for an improved **(more independent)** quality of life
- Organized a very successful Patient Preferences Workshop for Renal Devices in August 2015
- Strong representation from patients and their caregivers, industry partners and regulatory agencies

# Patient Preferences workshop: Challenges

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- Put together a multi-disciplinary committee that included patients
- Created an aggressive timeline
- Realized that the patients on the committee had no idea at all about what the FDA does or why the FDA should be interested or what the real end product of these calls would be (in terms of impacting patients)
- Retooled the entire project
- Interactive webinars (present the issues); have a two way conversation
- Provided travel support for some patients to attend



# Patient Preferences workshop: **Benefits**

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- Truly engaging patients (**not just having token representation so that we can check a box in a grant application**) is hard work
- We have to work hard at it (**physicians, regulators, industry and patients**)
- Resources
- Come out of your comfort zone
- Impact can be huge
- Right thing to do
- **TRUTH!**



# A patients perspective on improving ESRD care is often very different from the physicians

Patients/caregivers			Health professionals		
	Mean	Median		Mean	Median
Dialysis adequacy	7.9	9.0	Vascular access problems	8.5	9.0
Vascular access problems	7.8	9.0	Death/mortality	8.4	9.0
Ability to travel	7.7	9.0	Cardiovascular disease	8.4	9.0
Fatigue	7.7	8.0	Drop in blood pressure	7.8	8.0
Washed out after dialysis	7.6	8.0	Ability to work	7.7	8.0
Cardiovascular disease	7.5	8.0	Hospitalisation	7.6	8.0
Dialysis-free time	7.4	8.0	Fatigue	7.6	8.0
Anaemia	7.4	8.0	Infection/immunity	7.6	8.0
Death/mortality	7.4	9.0	Dialysis adequacy	7.5	8.0
Blood pressure	7.4	8.0	Impact on family/friends	7.2	7.0
Ability to work	7.2	8.0	Washed out after dialysis	7.2	7.0
Impact on family/friends	7.2	8.0	Pain	7.2	7.0
Mobility	7.2	8.0	Depression	7.2	7.0
Infection/immunity	7.1	7.0	Target weight	7.2	7.0
Drop in blood pressure	7.0	8.0	Blood pressure	7.2	7.0
Pain	6.9	7.0	Anaemia	7.2	7.0
Potassium	6.8	7.0	Mobility	7.2	7.0
Target weight	6.7	7.0	Dialysis-free time	7.0	7.0
Hospitalisation	6.5	7.0	Potassium	7.0	7.0
Depression	6.5	7.0	Ability to travel	6.7	7.0

Tong et al.  
SONG  
Initiative



# ***Developing a Roadmap for Innovative Alternatives to RRT***

***Draft Proposal***

**Implantable**

**(Re)Generate/  
Biological  
Kidney**

**Chimeras/  
Xeno**

**Biohybrid  
Devices**

**Mechanical  
Devices**

**Wearable**

**Mechanical  
Devices**

**Financial and  
Coverage  
Considerations**

**Regulatory  
Considerations**

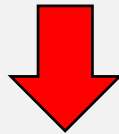
**Incremental  
Dialysis  
Improvement**

Presented at  
ASN Kidney Week 2017  
New Orleans, LA

# Vision Level

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**TPP/Patient Voice**



**Design Criteria**

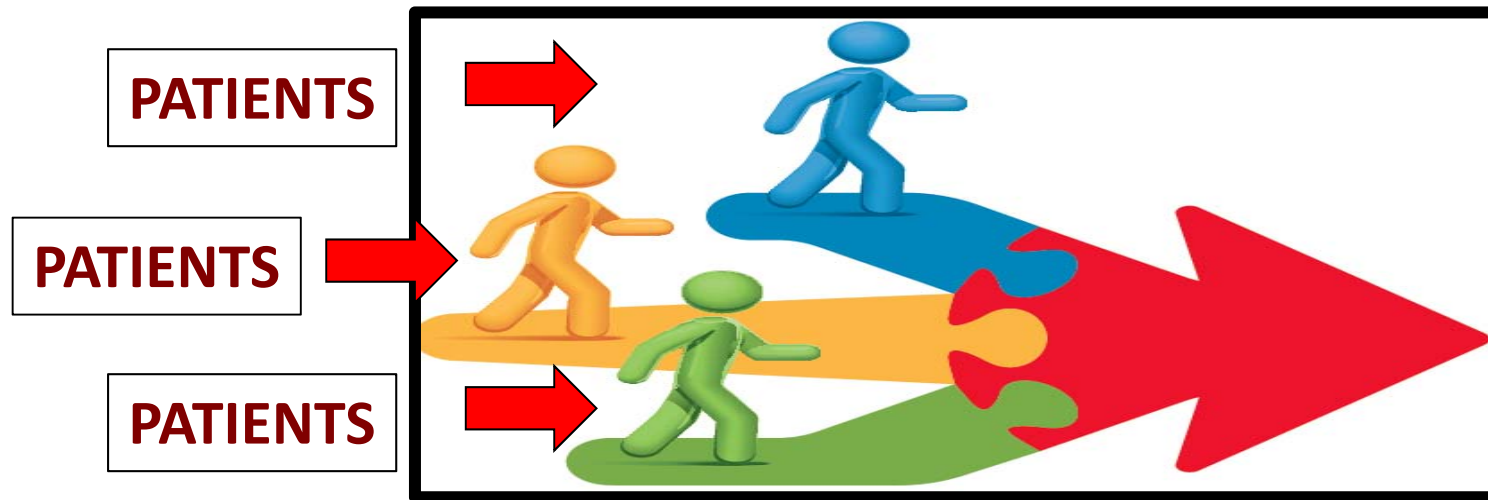
**Clearance/Ultrafiltration/Weight/Portability/Endocrine**



**Technical/Regulatory Milestones**

# Take Home Message

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- Real Progress in Therapeutic Product Development can only be made through a multi-disciplinary approach that includes academia, industry, federal agencies and most importantly the END USER
- *Critical need for platforms to be able to do this*

**Melissa West, KHI Project Director**  
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