

How I Use Early Cannulation Grafts (and why)

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Disclosures

I have the following potential conflicts of intrests:

- Receipt of grants/research support: WL Gore, Proteon Therapeutics
- Receipt of honoraria and travel support: WL Gore, EusaPharma

Outline: How I Use Early-Cannulation Grafts

1. Our learning curve –
   steps taken to improve graft outcomes in consecutive patients

2. Where is the future?

Workload: Firmly preferably fistula

2012-17:

2,418 AVF, 276 AVG, ‘2,000’ Catheters

Prevalence – 10-15% AVG, 60-70; 40 new AVG/yr

Glasgow: three eras of ecAVG experience

Driver: the costs of TCVC
- CVS
- Infection

- J Vasc Access. *2014;15(5):344-35*
- J Vasc Access. *2015;16(9): 42-47*
- J Vasc Access. *2014;15(6):466-473*
- NDT. *2010;25(5):1596-604*
- J Vasc Access. *2014;15(5):344-350*

i. ecAVG as salvage access

exclusive

- J Vasc Access. *2014;15(6):481-485*

Increasing confidence + awareness of patient outcomes

ii. RCT catheter replacement

inclusive

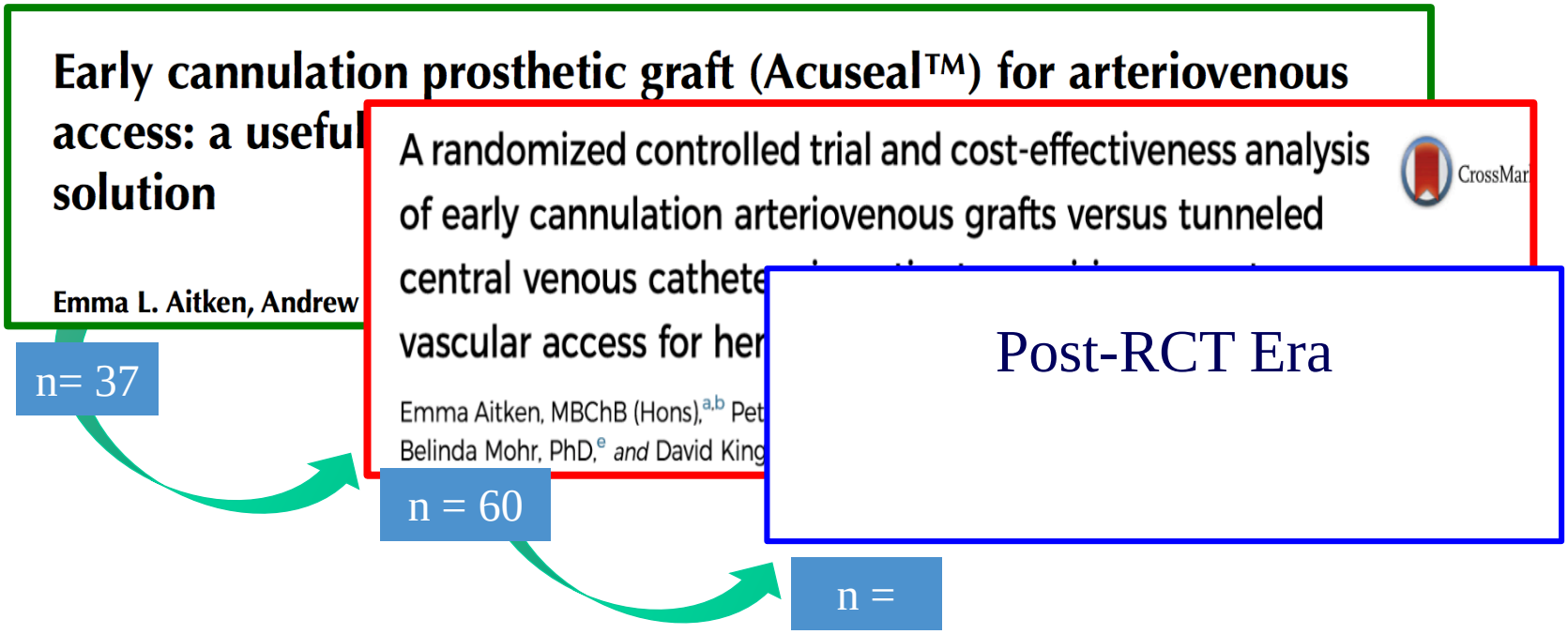
- J Vasc Access. *2016;17(3):220-228*
- Trials. *2015;16:42*
- J Vasc Surg. *2017;65(3):766-774*

iii. Post-RCT world

selective

- NDT. *2018;Feb 1:epub ahead*

3 Eras: indications + 1 yr FU of outcomes



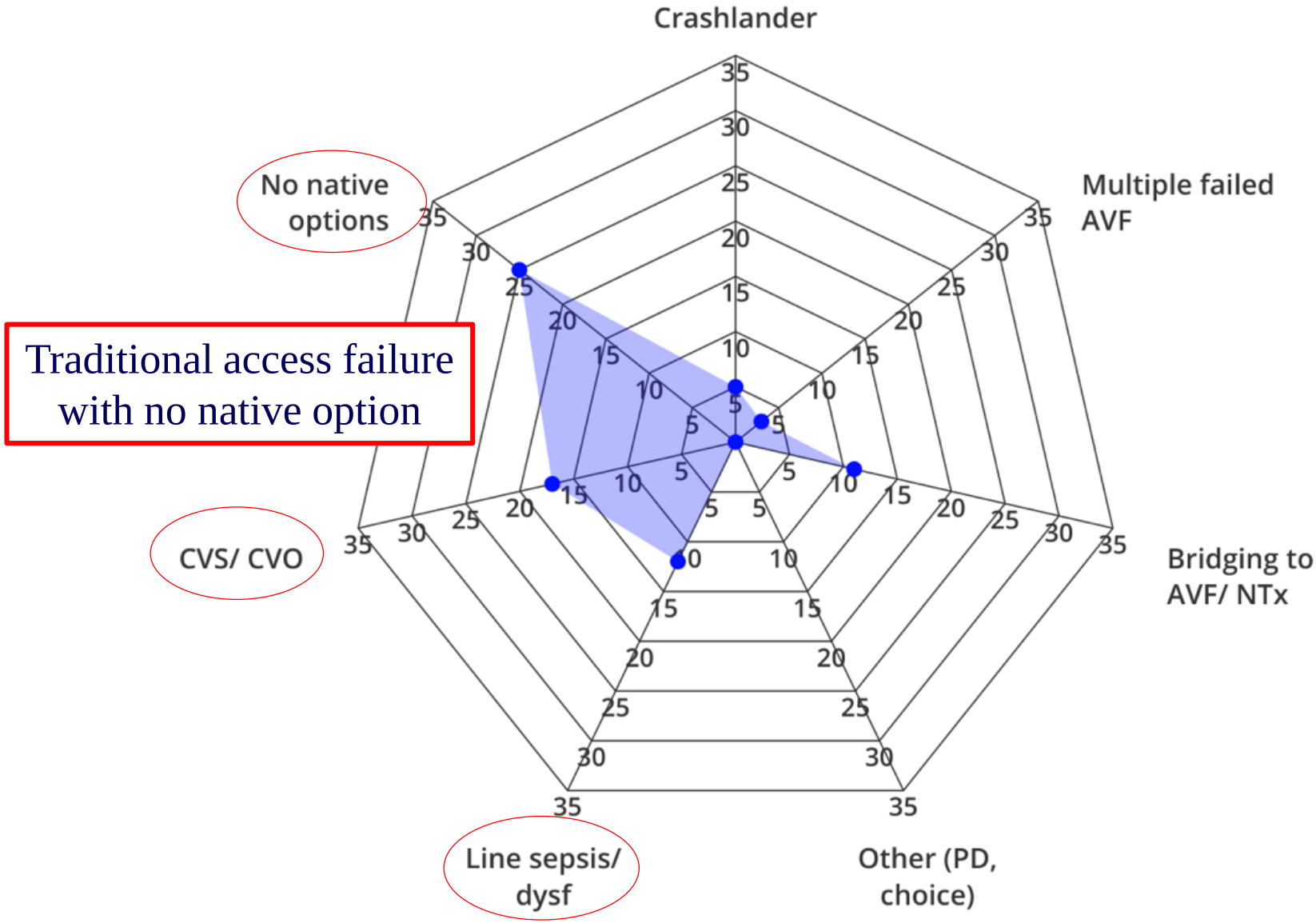
Nursing Outcomes – Surgical Outcomes – Int Radiology Outcomes

ecAVG has exposed the weaknesses in system – a team approach

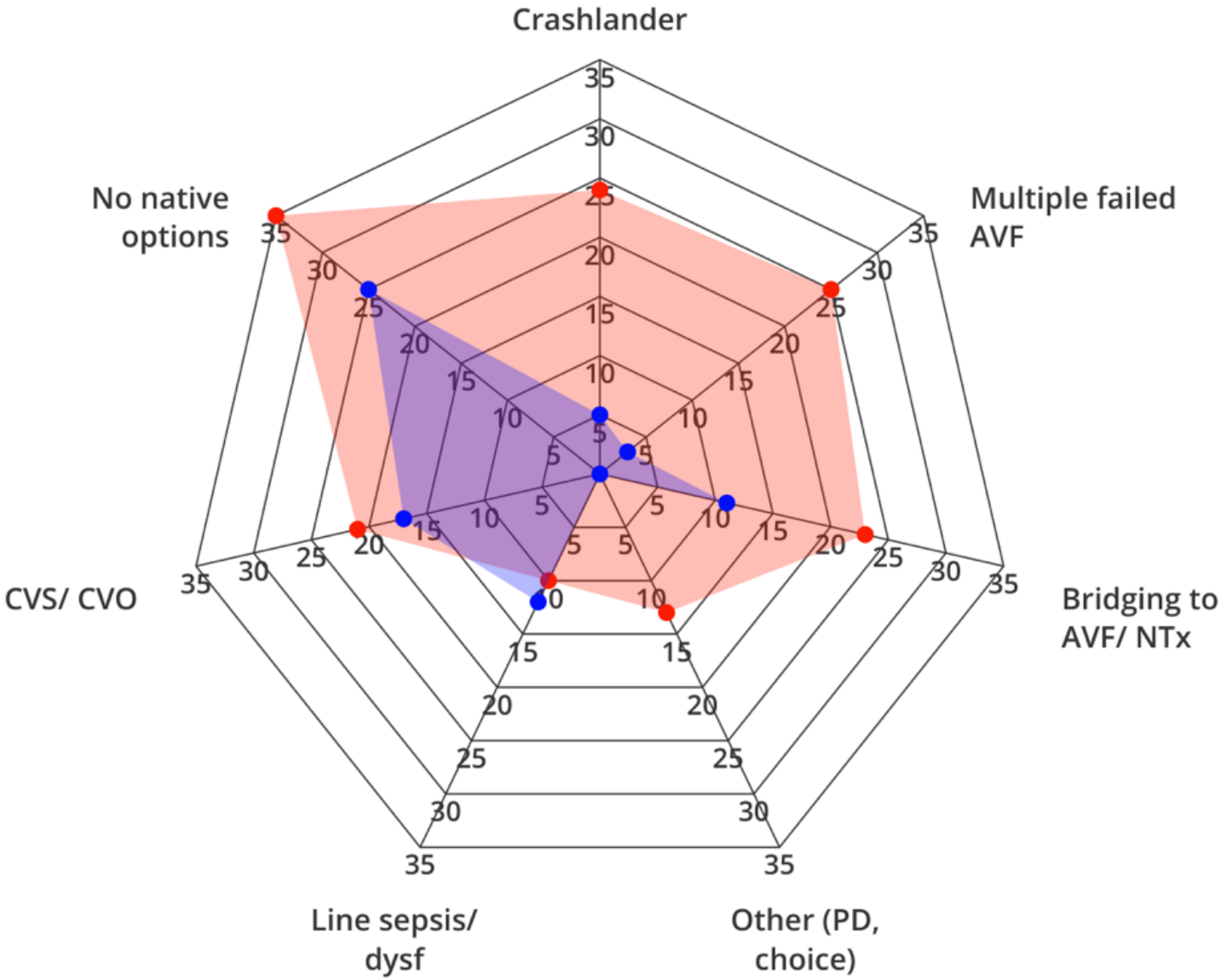
How I Use Early-Cannulation Grafts

1. Has our indication changed?

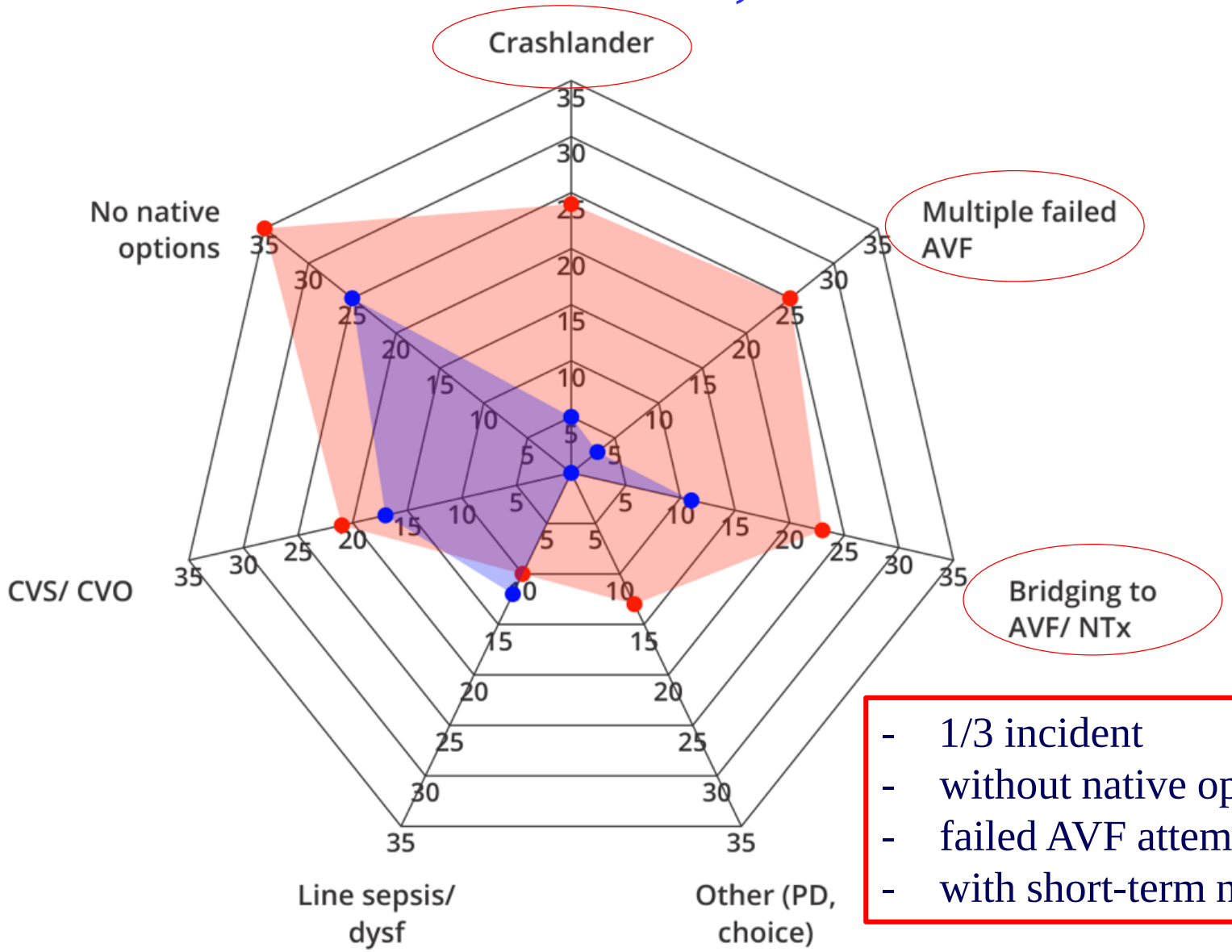
Indication: 2011-2013, n=37 in 36m; 1/mo.



Indication: 2015-2017, n=96 in 27m, 3.5/mo.



Indication: 2015-2017, n=96 in 27m, 3.5/mo.



- 1/3 incident
- without native option
- failed AVF attempts
- with short-term need

Has Our Indication For ecAVG Changed?

Yes: we choose to offer as an option –

1. in more patients
2. for a wider spectrum of indications:
   (salvage access)
   AVF futility of further procedures
   catheter avoidance (crash-landers)
   ‘no native options’ now ‘not good native option’
3. learnt not a good option for all ……

Has Our Indication For ecAVG Changed?

Wary:

1. In patients who cannot comply:

   fluid restriction (shifts on HD of fluid + Bp),

   time needed on/off + flows 250mls/min

   surveillance

2. Chronic ‘inflammatory’ conditions / pro-thrombotic:

   If needed – High flow, optimal medical therapy

How I Use Early-Cannulation Grafts

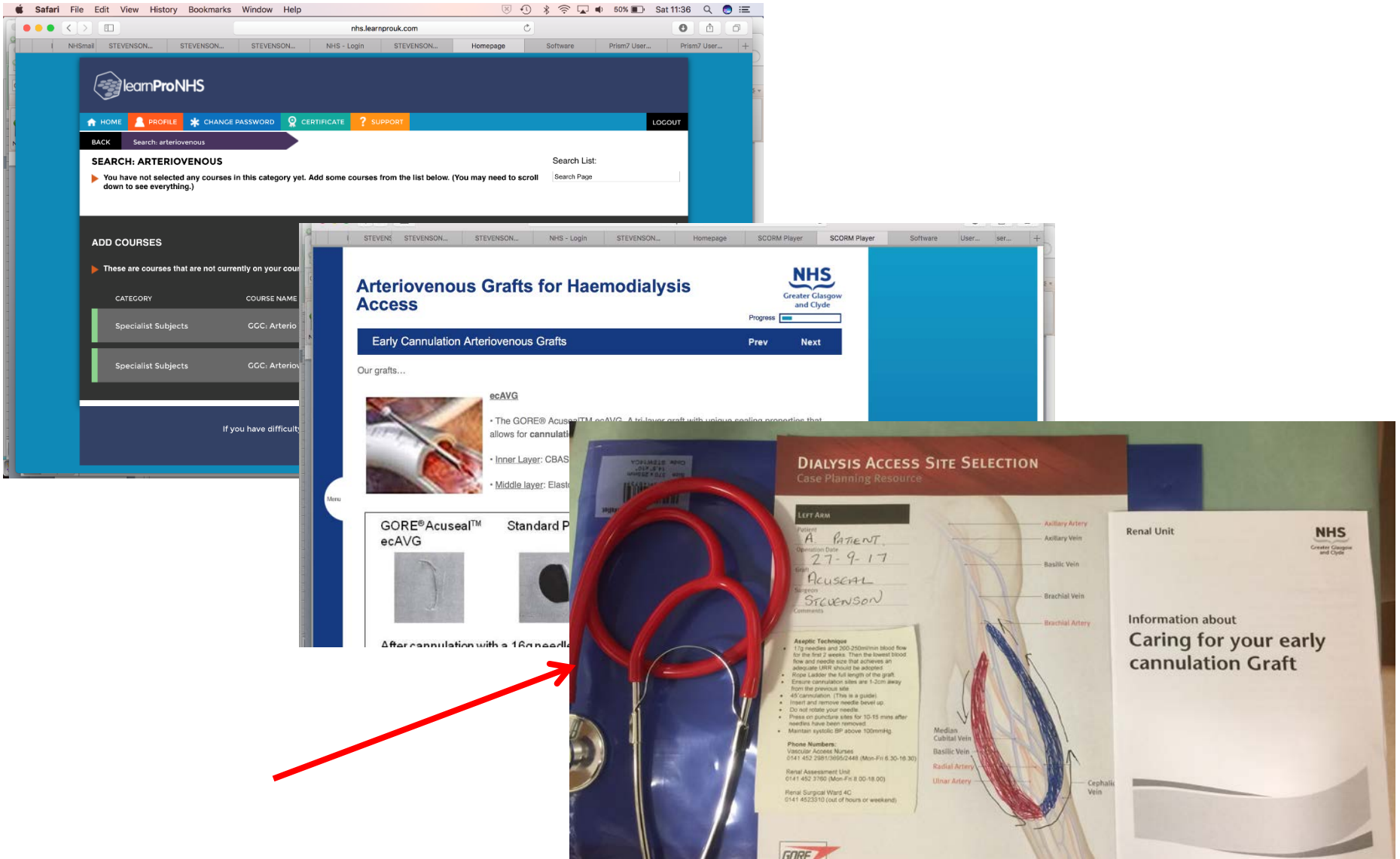
1. Has our indication for Acuseal changed?

2. Are the outcomes better? If so why?
   a. Cannulation complications: the Achiles heel
   b. Steal: limiter of patient selection
   c. Patency / Thrombectomy

Nursing Outcomes + System Changes by Era

	Initial Cohort n = 37	Trial Cohort n = 60	Current Cohort n = 96
Cannulation Complications	16%	13%	7%
System Changes	• HD nurse training • Nurses study days	• Team Cadaveric Course • Link nurses • Implant technique (feedback)	• Patient Packs • OnLine learning

Compulsory On-Line Training & Patient Packs



Technical Outcomes: Steal, Infection

	Initial Cohort n = 37	Trial Cohort n = 60	Current Cohort n = 96
'Steal' (graft loss)	2.7%	8% (2%)	4% (1% IMN)
'Infection' (loss)			11% (3%)

Infection n=11 in year 1

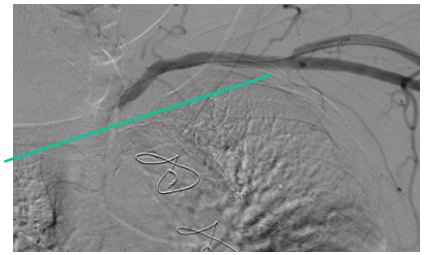
Graft Loss n=3 (calcipylaxis, 'suspected' culture neg, picker)

Infected needle sites n=8; 6 conservative, 2 excised segment

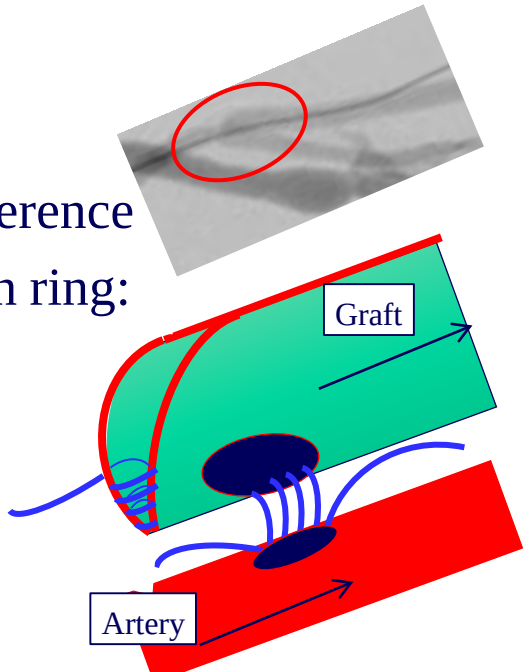
Minimising Steal

- Use leg graft: never steal from CFA (n=74)

- Avoid brachial artery: <4mm / DM
  - Proximalise: prox. brachial or infra-clav. axillary art
  - Distalise inflow: radial proximal / distal with vein cuff



- Modify anastamosis:
  - Side to side: lies parallel, no kinking, fixed circumference
    4mm aortic punch = 10 sutures - fixed constriction ring:
  - Tozzi revision: tapered end
  - Taper grafts: 4-6mm tapered Acuseal®



Improved Outcomes by Era: Patency

	Initial Cohort n = 37	Trial Cohort n = 60	Current Cohort n = 96
Functional Patency (1yr)	40.5% Death-transplant	50% 23% AVF switch	82.7%

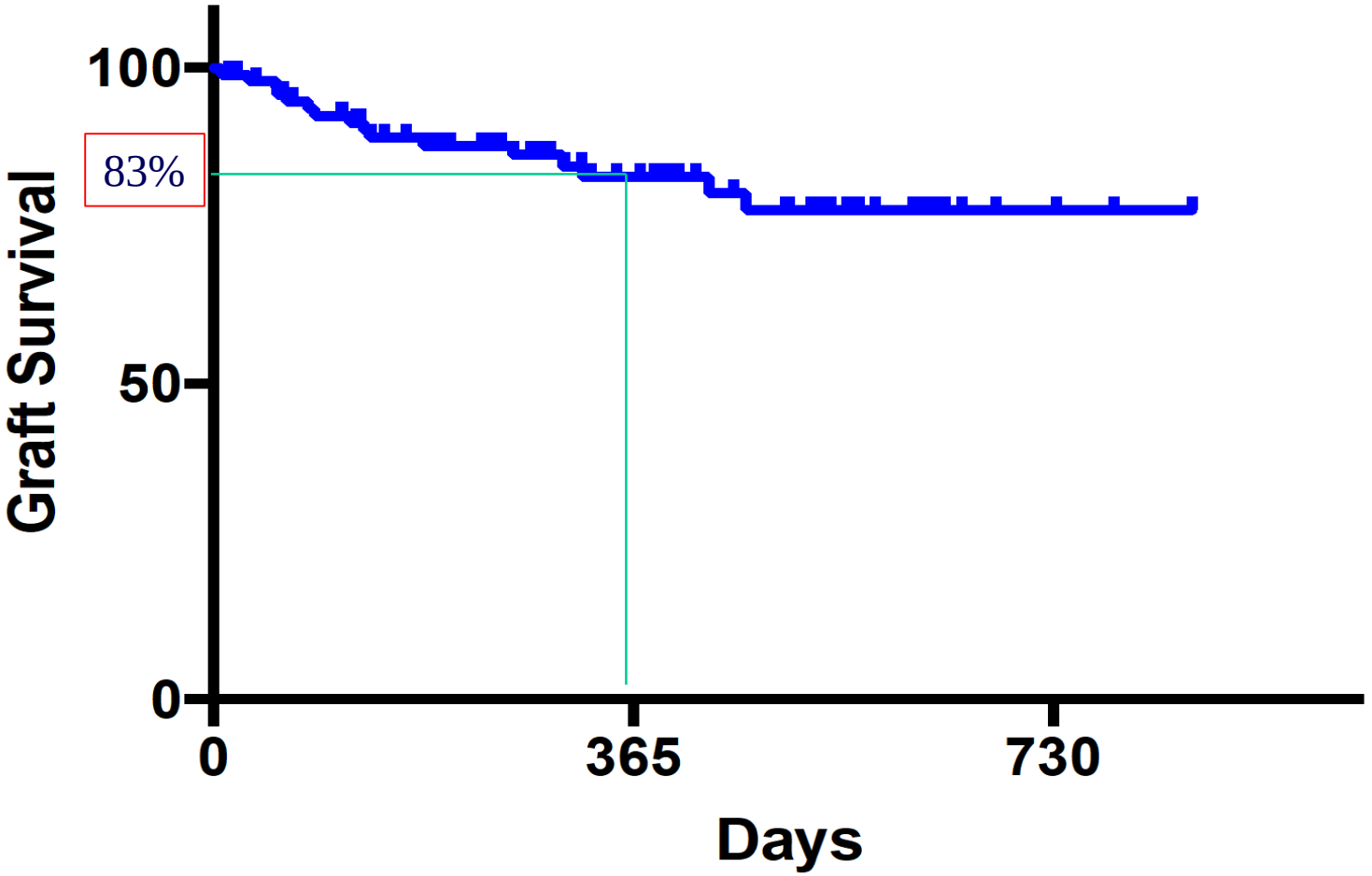
Meaningful Rates:
Functional patency – thrombosis rate for surveillance intervention

Over-lapping Complicating Factors:

- Surveillance + Interventions
- Thrombosis frequency
- Patient Outcome: Death, AVF conversion, Tx

Functional Patency Post-RCT

(n=96 consecutive, 34,388 FU days 25/2/2015 - 25/12/2017)



Surveillance Protocols by Era

	Initial Cohort n = 37	Trial Cohort n = 60	Current Cohort n = 96
Functional Patency (1yr)	40.5% Death-transplant	50% 23% AVF switch	82.7%
Type of surveillance	None	3/12 DSA + US	3/12 DSA US post1yr
Interventions	Plasty alone		Primary stent-graft

Thrombosis Rates by Era

	Initial Cohort n = 37	Trial Cohort n = 60	Current Cohort n = 96
Thrombectomy (per/ptnt/1000 days)	-	0.196	0.017 57 episodes in 96 patients for 34,388 days

Thrombosis: 34/96 in yr 1, often multiple causes

Why does it happen? Aetiology:

70% venous stenosis (peripheral + central)

¾ had failed-inadequate surveillance

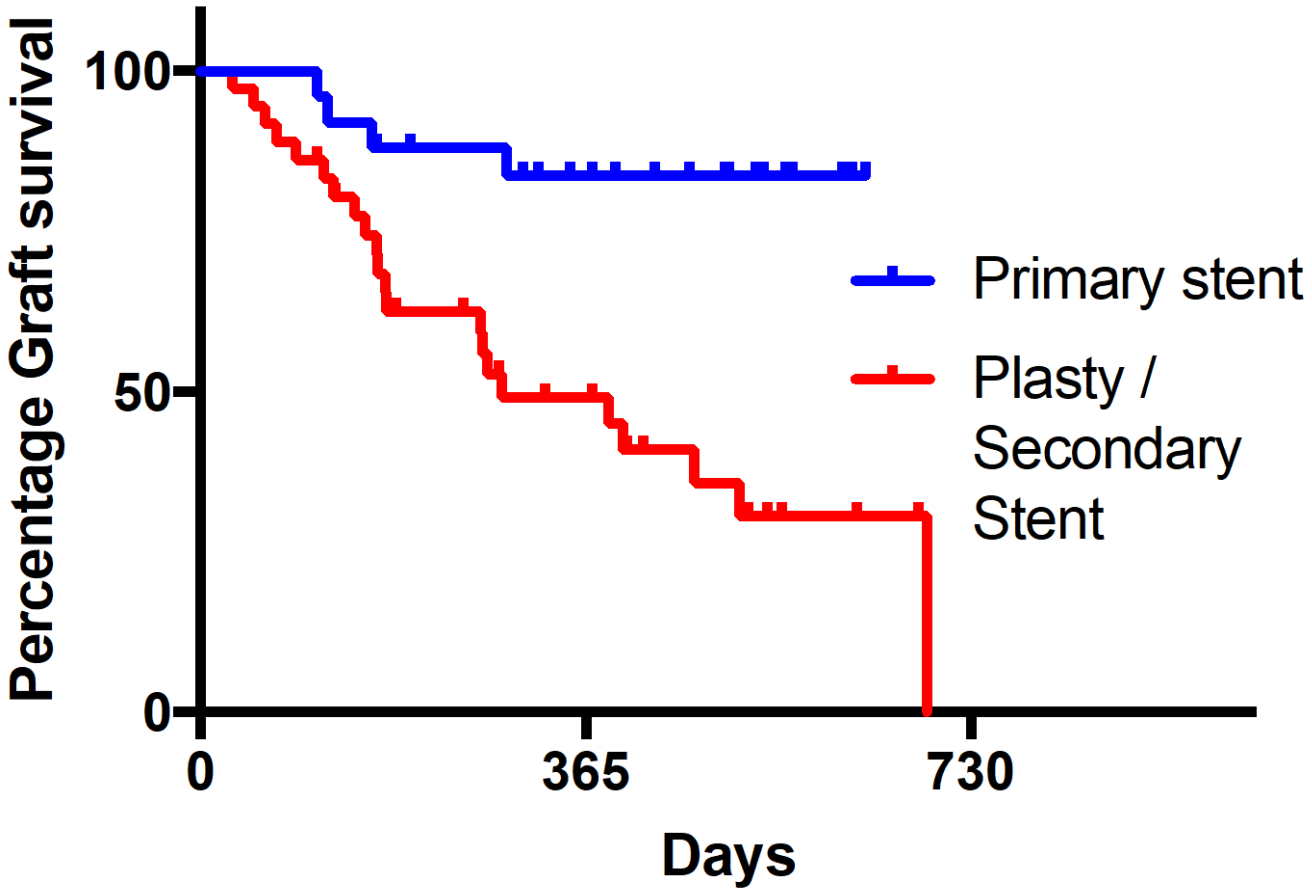
When does it happen? Timing:

30% additional reasons (dehydration/Bp/illness/syst. infctn)

12% no reason found

Thrombosis after Intervention:

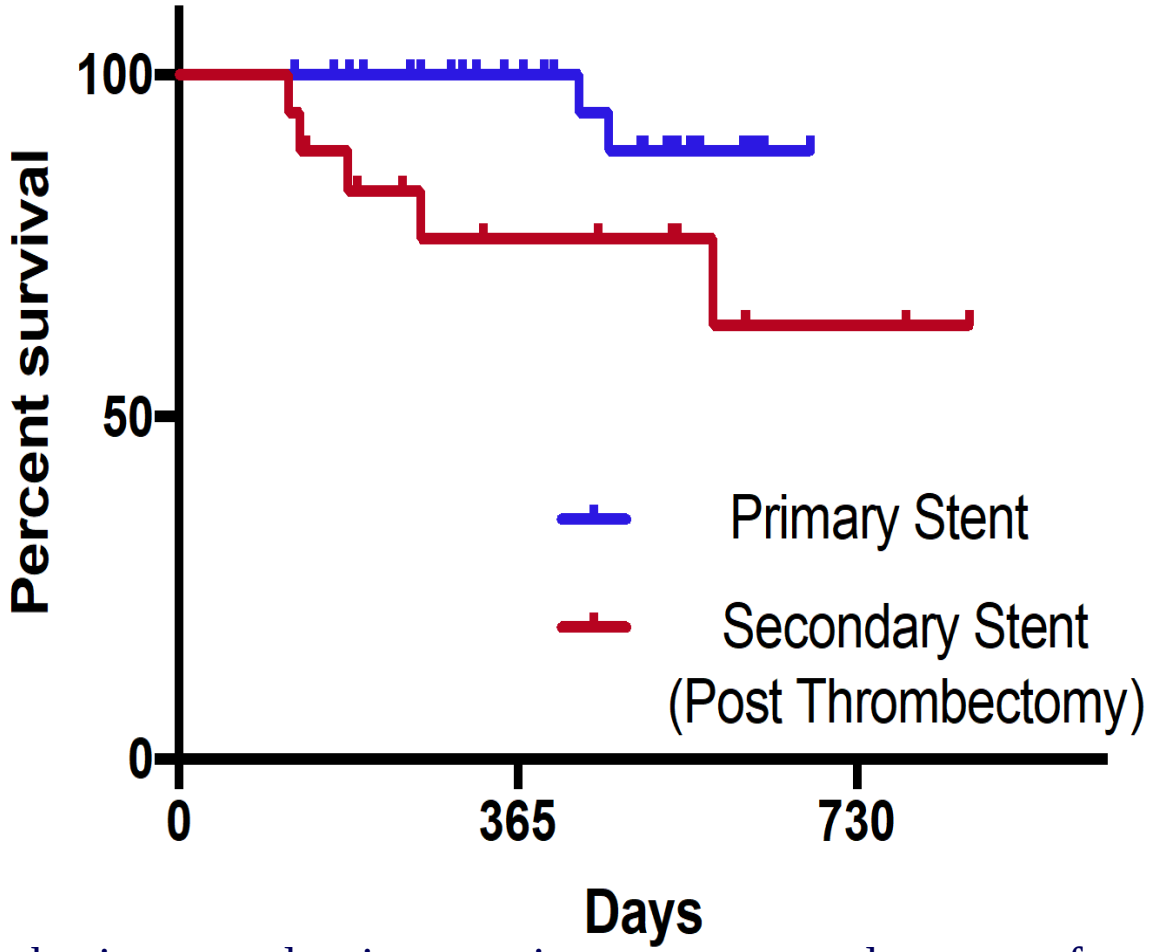
stent-graft: primary at surveillance vs. plasty/ post-thrombectomy



Higher thrombosis rate and re-intervention rate

Functional Patency after Intervention:

stent-graft: primary at surveillance vs. plasty/ post-thrombectomy



Higher thrombosis rate and re-intervention rate + poorer long term-functional patency

Surveillance: essential, use stent-graft primarily

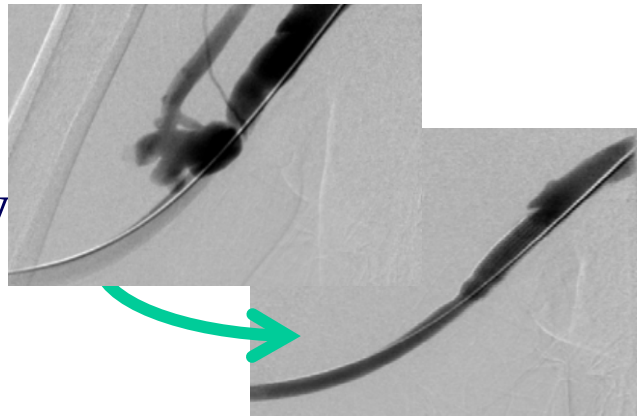
Key:

Graft thrombosis to be avoided

– more interventions, often as emergency

– higher graft loss

+ patency of 1^{ry} stent-graft excellent



Our surveillance :

3/12 DSA + Indication (flow/pressures) + Patient Initiated

Surveillance: essential, use stent-graft primarily

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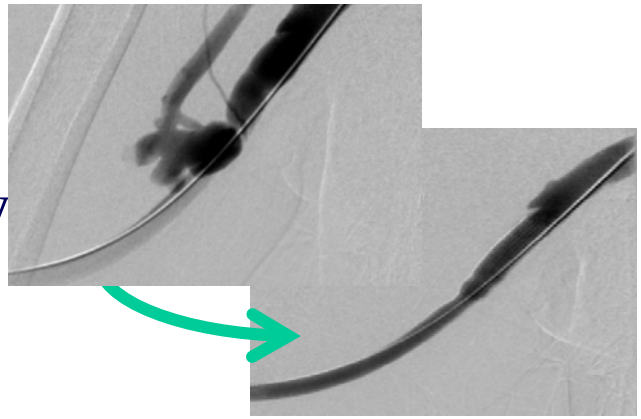


Our surveillance : (n=96, full FU)

3/12 DSA + Indication (flow/pressures) + Patient Initiated

- 45% of Surveillance angiography led to intervention

Surveillance: essential, use stent-graft primarily

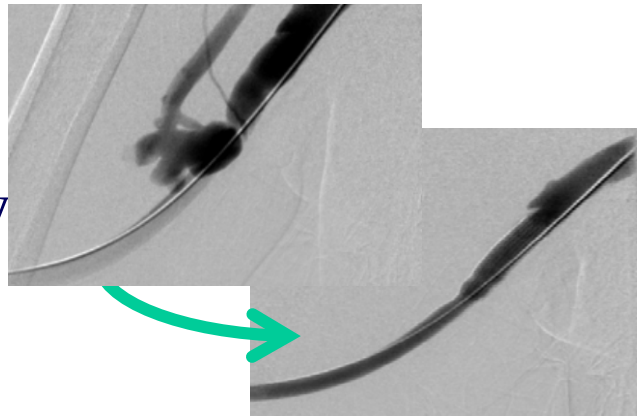
Key:

Graft thrombosis to be avoided

– more interventions, often as emergency

– higher graft loss

+ patency of 1ry stent-graft excellent



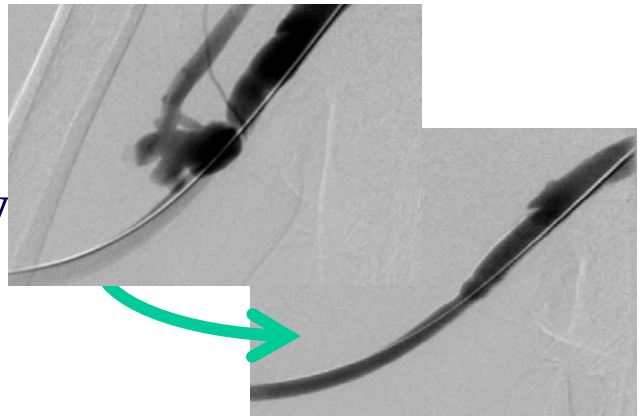
Our surveillance : (n=96, full FU)

3/12 DSA + Indication (flow/pressures) + Patient Initiated

- 45% of Surveillance angiography led to intervention
- 71% of Indication angiography led to intervention

Surveillance: essential, use stent-graft primarily

Key:
Graft thrombosis to be avoided
– more interventions, often as emergency
– higher graft loss
+ patency of 1ry stent-graft excellent



Our surveillance : (n=96, full FU)

3/12 DSA + Indication (flow/pressures) + Patient Initiated

- 45% of Surveillance angiography led to intervention
- 71% of Indication angiography led to intervention
- 83% of Patient-Initiated angiography led to intervention

Early Cannulation Grafts Cost-effectiveness

Contemporary View

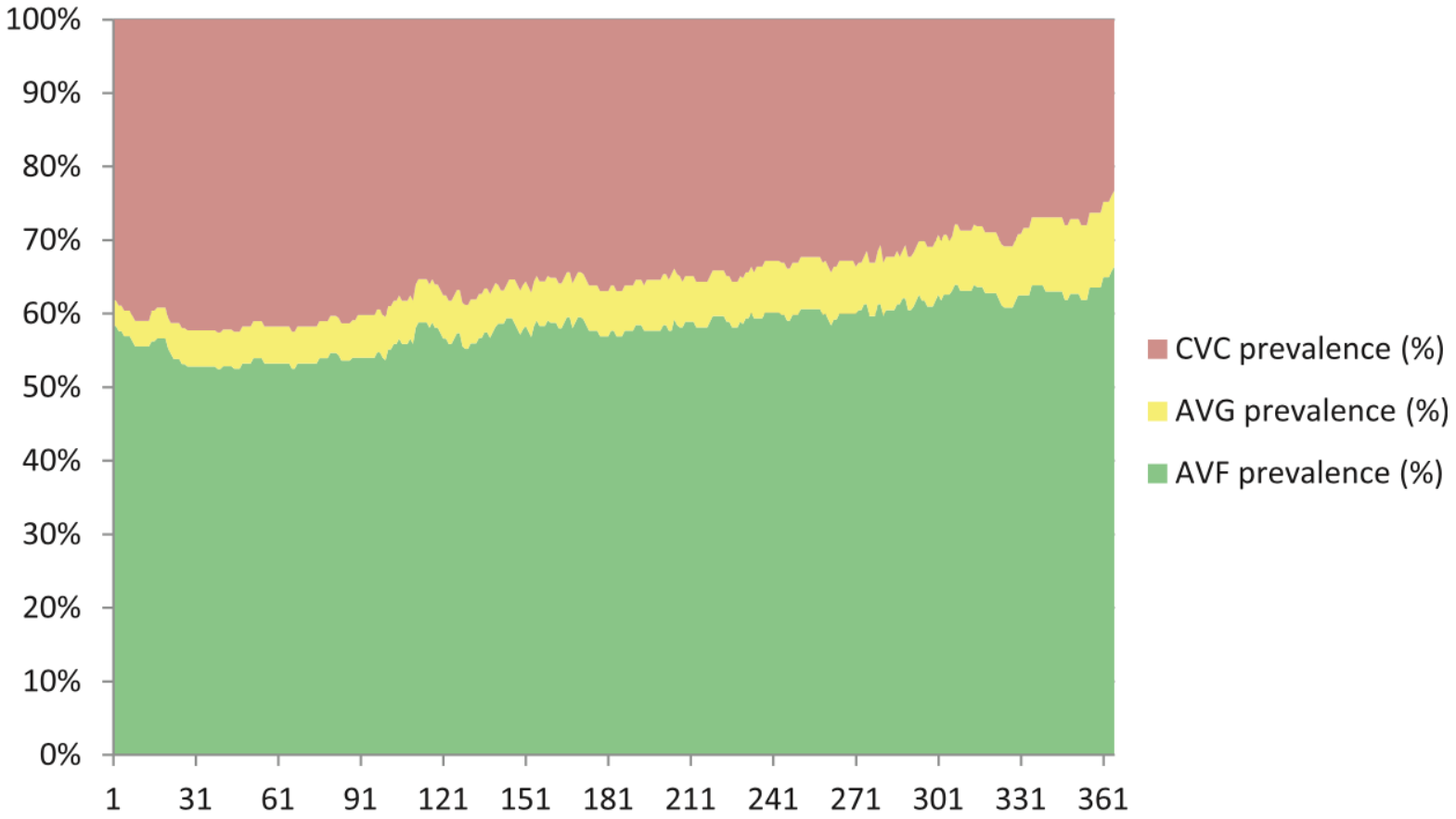
Current practice has been refined – good outcomes

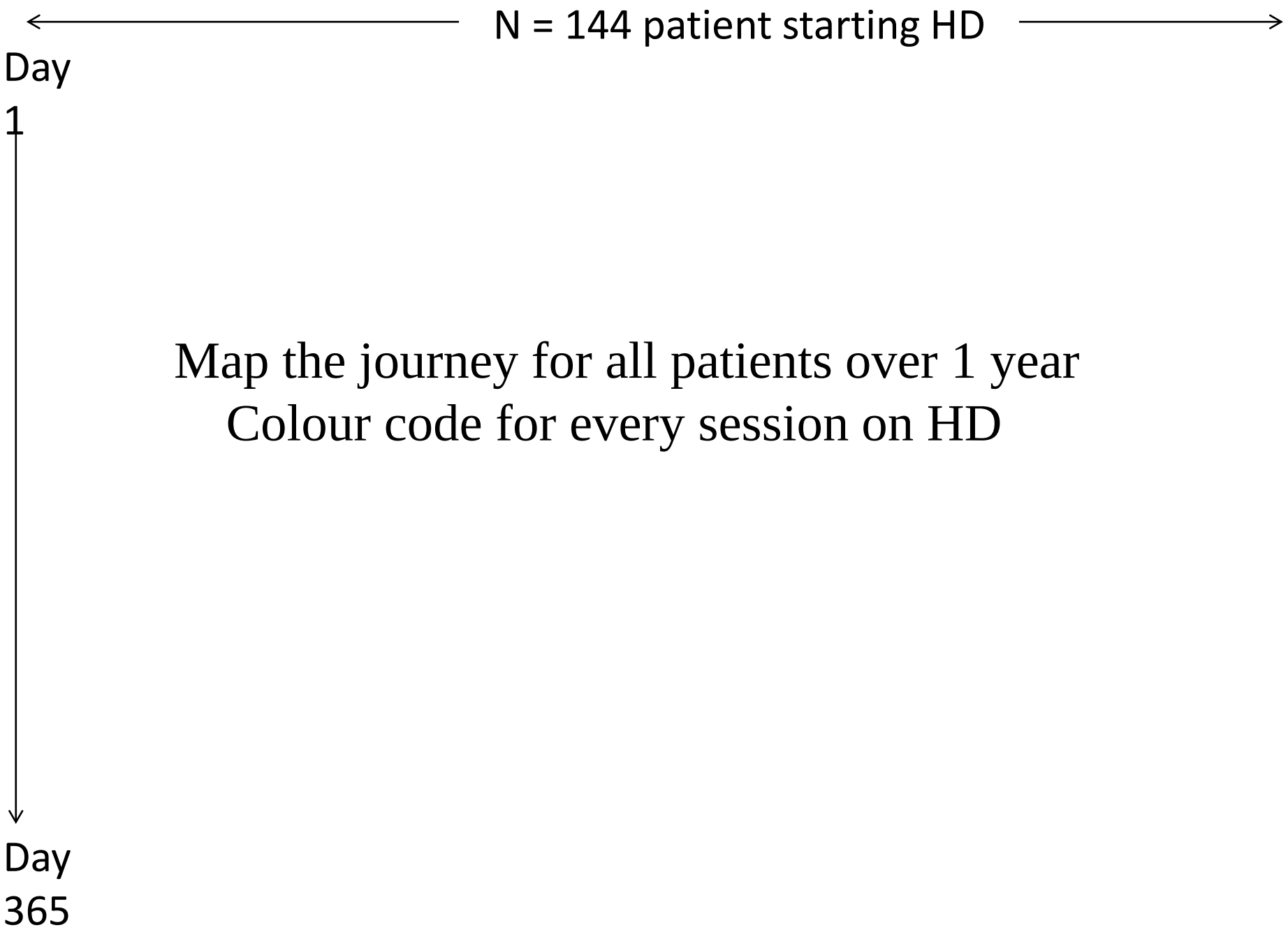
Who should get an ecAVG or AVF attempts?

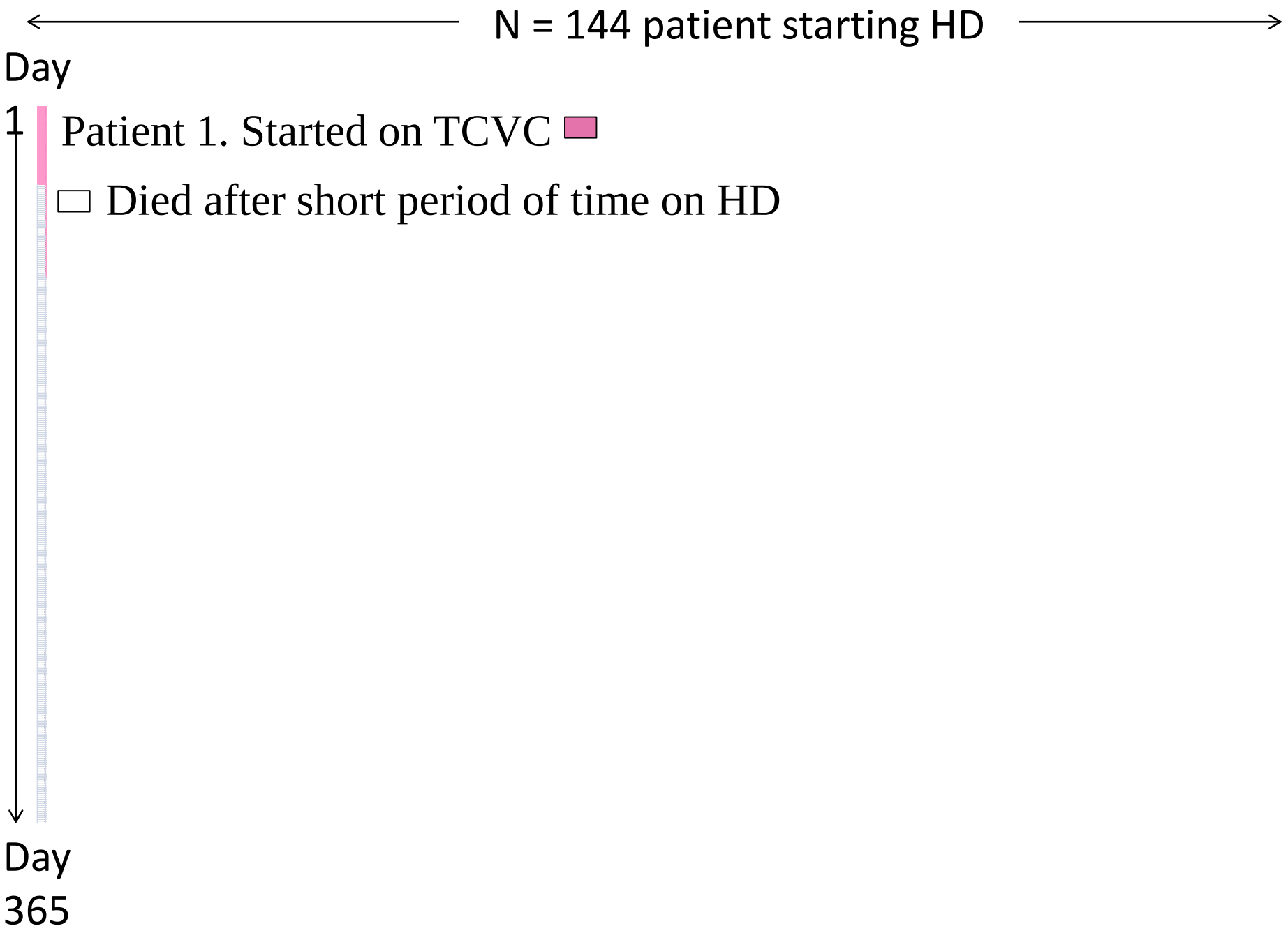
Consider consecutive incident patients,
over 2yr time period (up to 2013-2015, 1 year FU, 48,000 hdd)
and map their journey ……

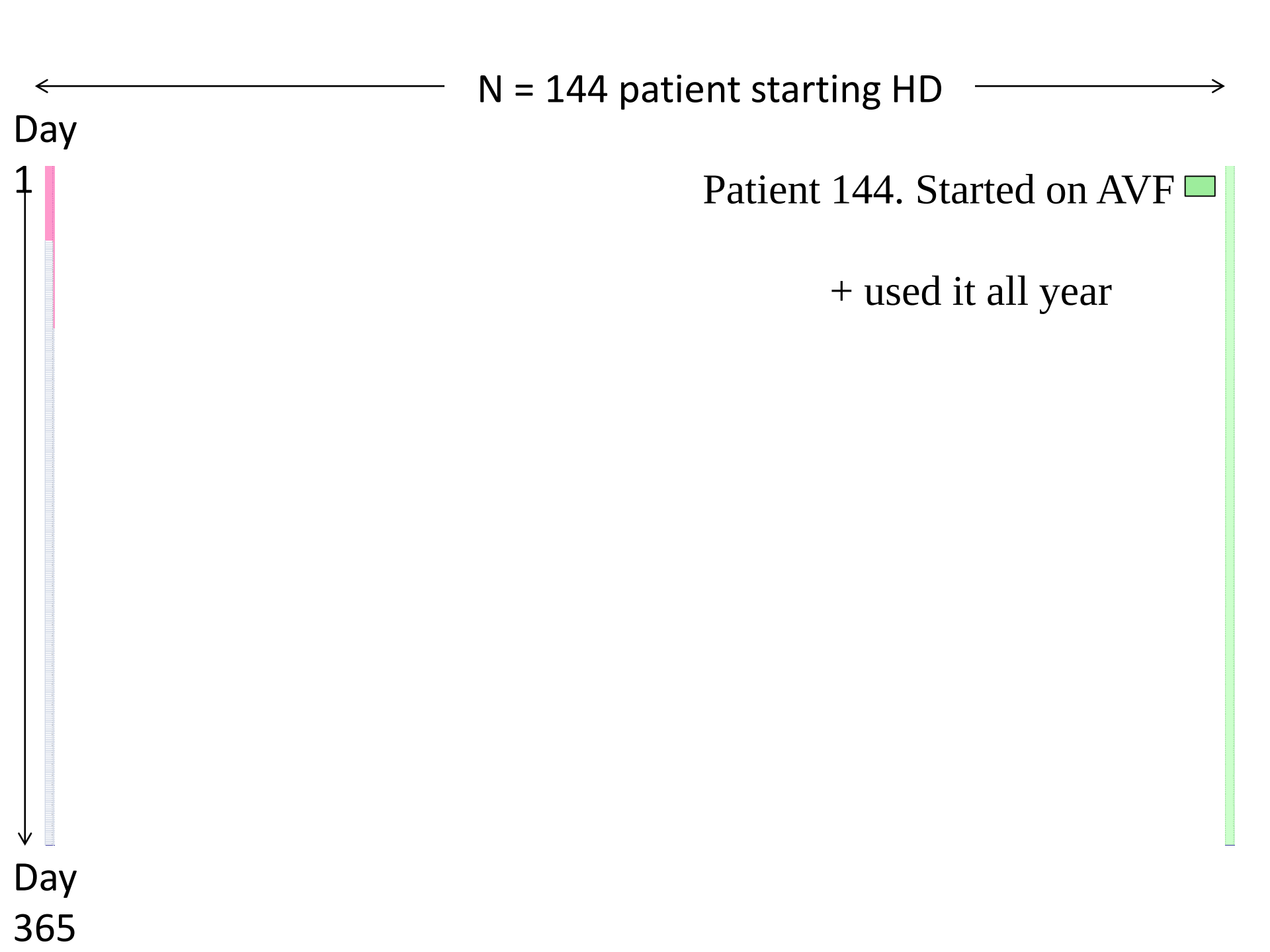
NDT. *2018;Feb 1:epub ahead*

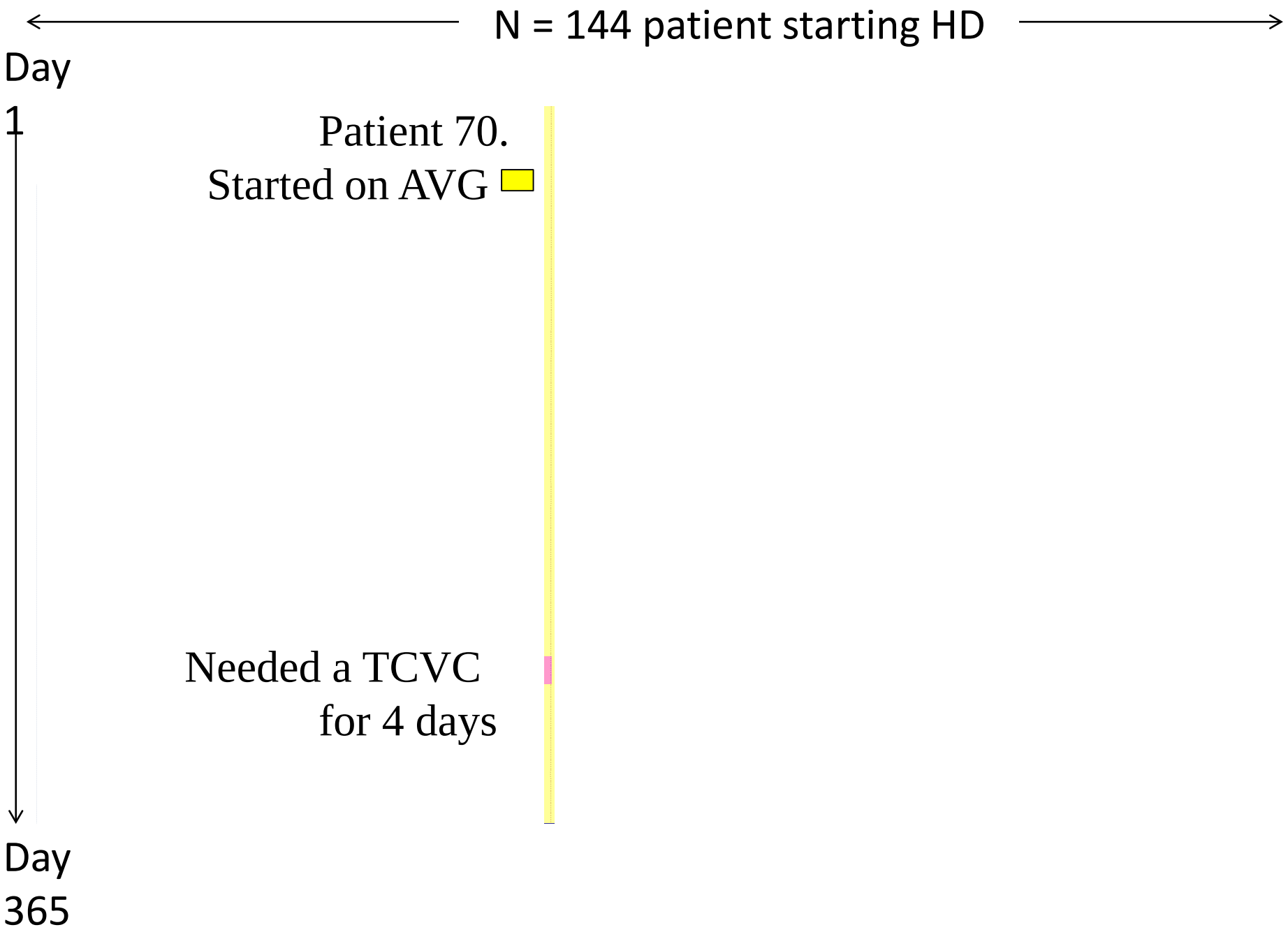
Access Prevalence By Time

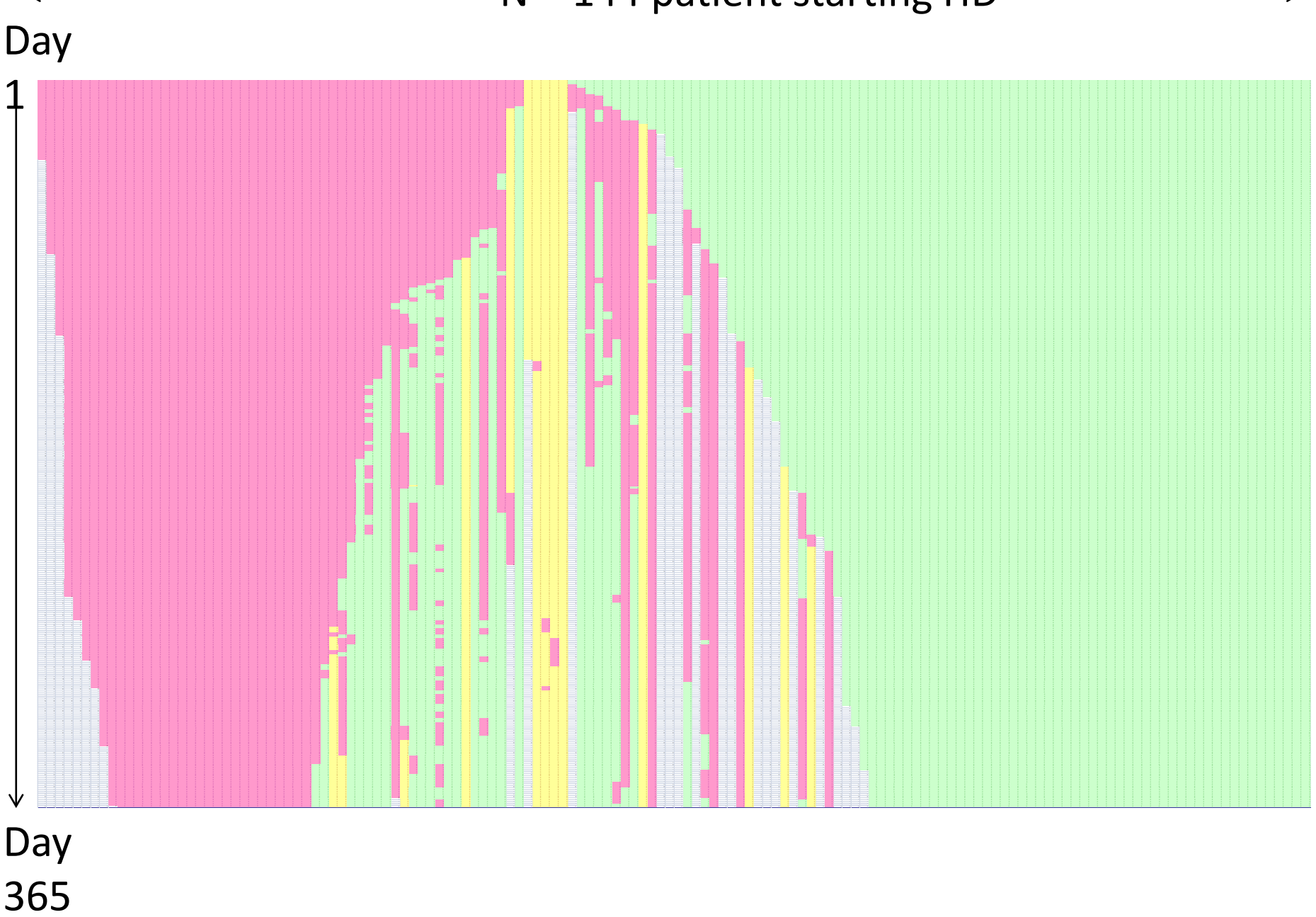


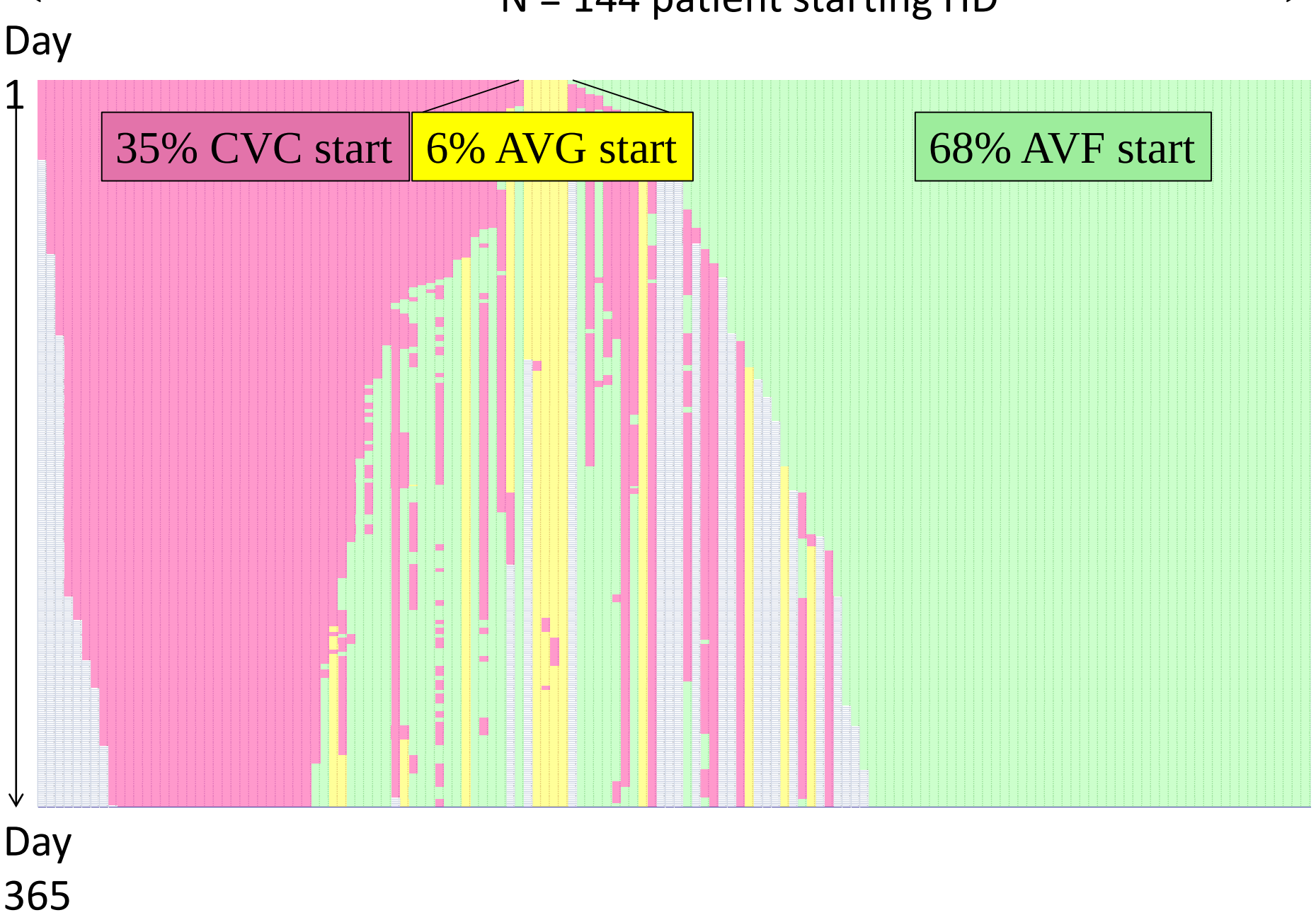

N = 144 patient starting HD
Day 1
Day 365
Map the journey for all patients over 1 year
Colour code for every session on HD

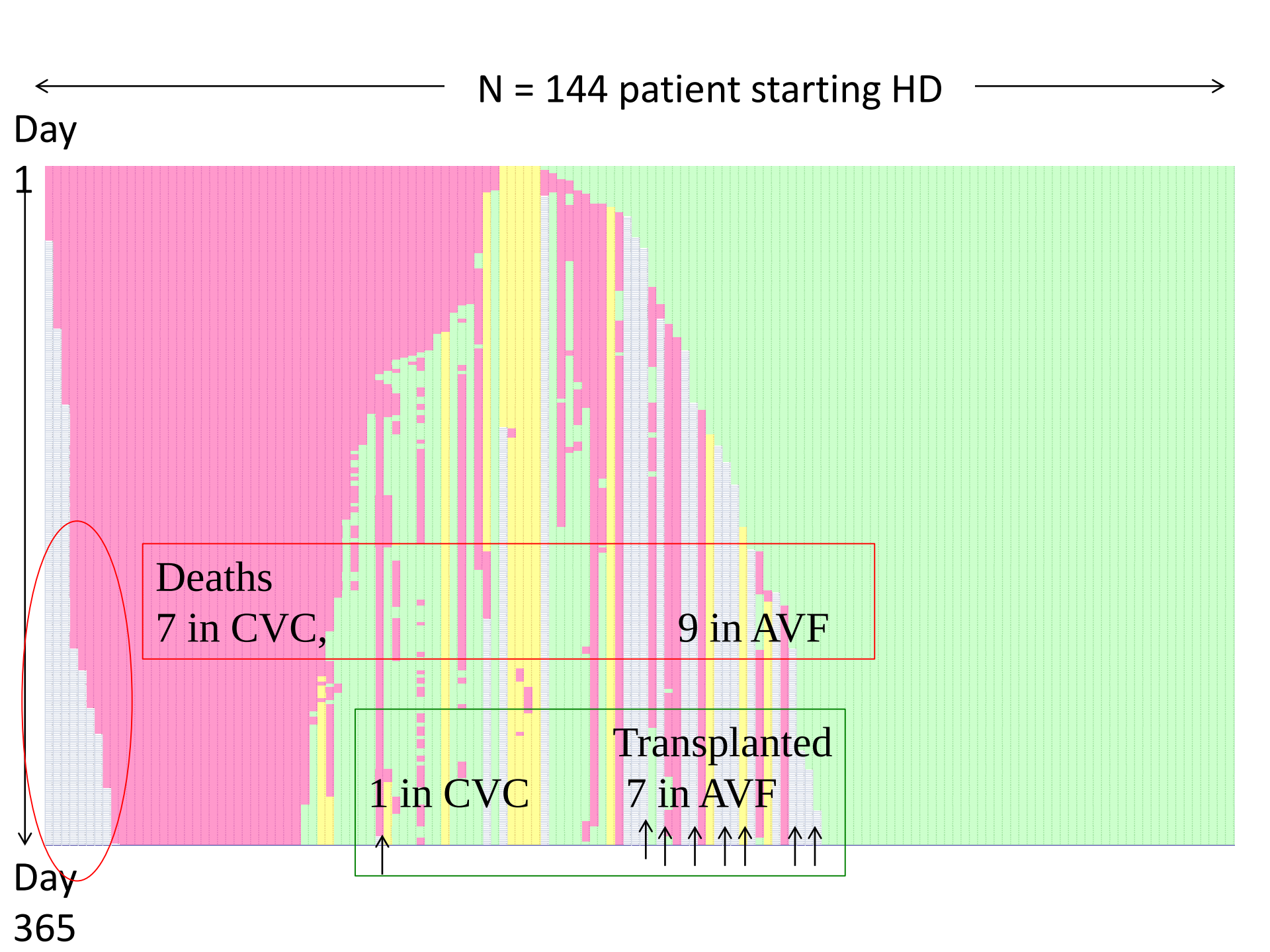

N = 144 patient starting HD
Day
1
Patient 1. Started on TCVC
Died after short period of time on HD
Day
365


N = 144 patient starting HD
Day
1
Patient 144. Started on AVF
+ used it all year
Day
365

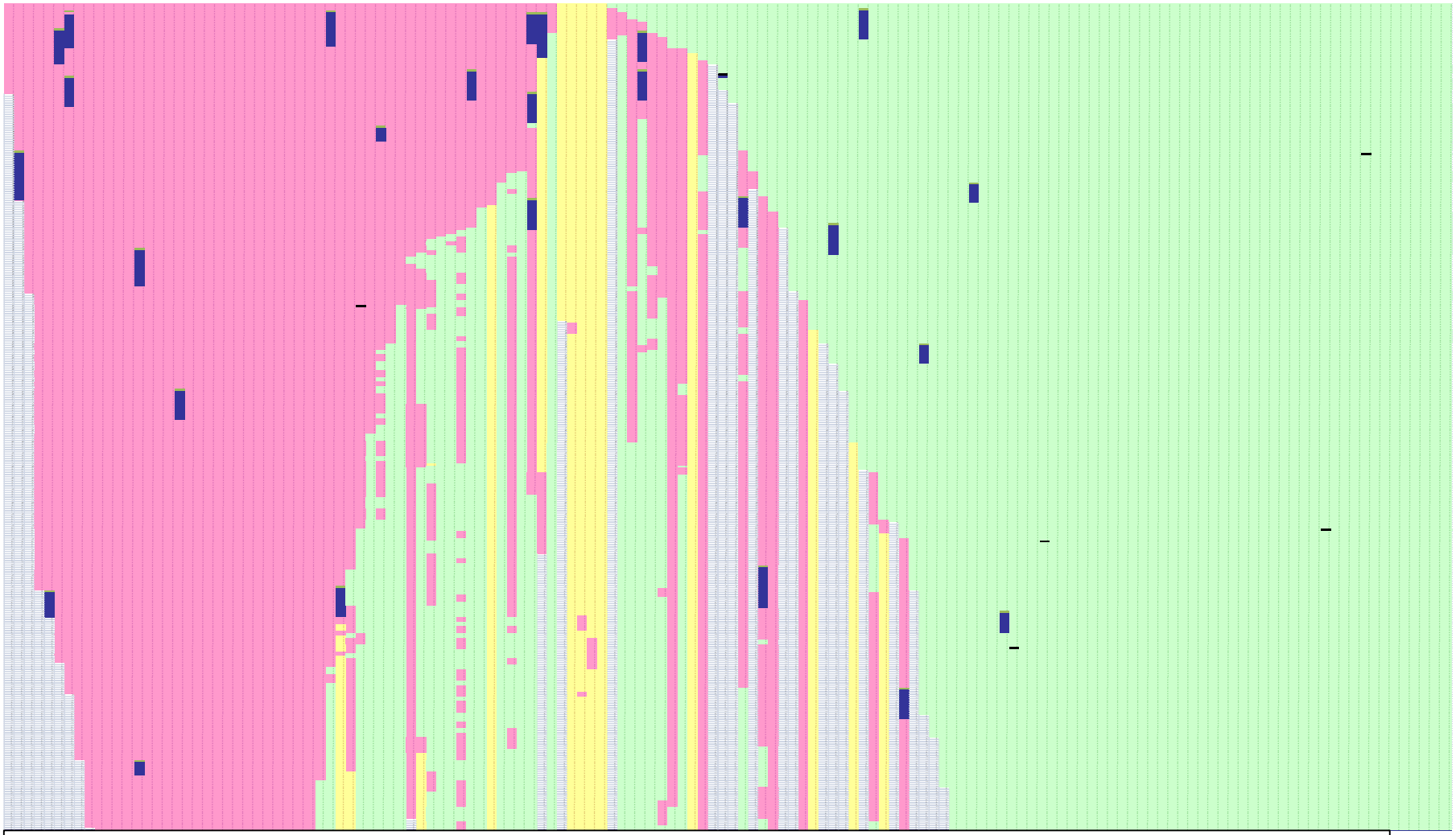

N = 144 patient starting HD
Day 1
Patient 70.
Started on AVG
Needed a TCVC for 4 days
Day 365


N = 144 patient starting HD
Day
1
Day
365


N = 144 patient starting HD
Day
1
35% CVC start
6% AVG start
68% AVF start
Day
365

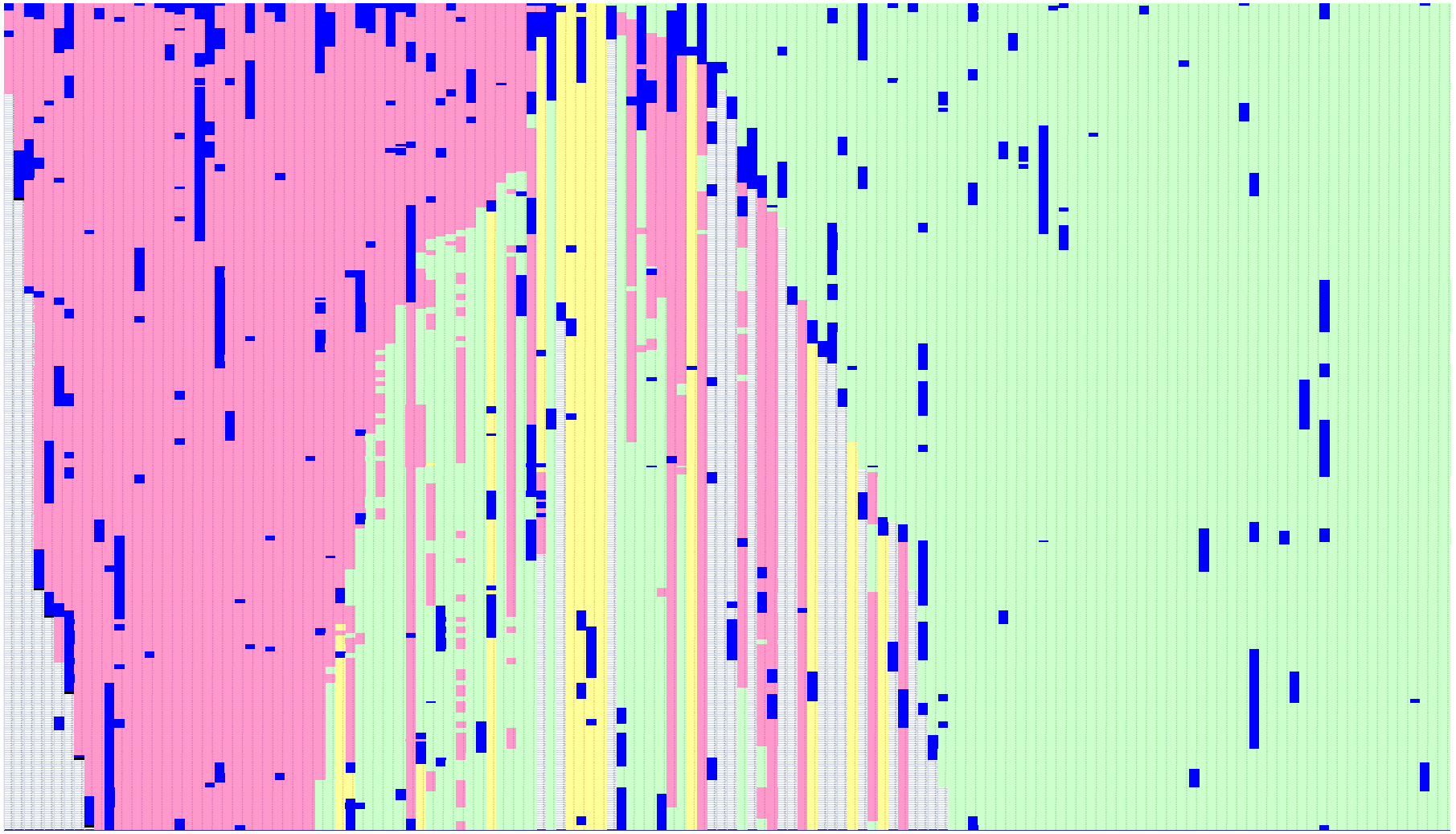

N = 144 patient starting HD
Day
1
Deaths
7 in CVC,
9 in AVF
Transplanted
1 in CVC
7 in AVF
Day
365

Bacteraemia



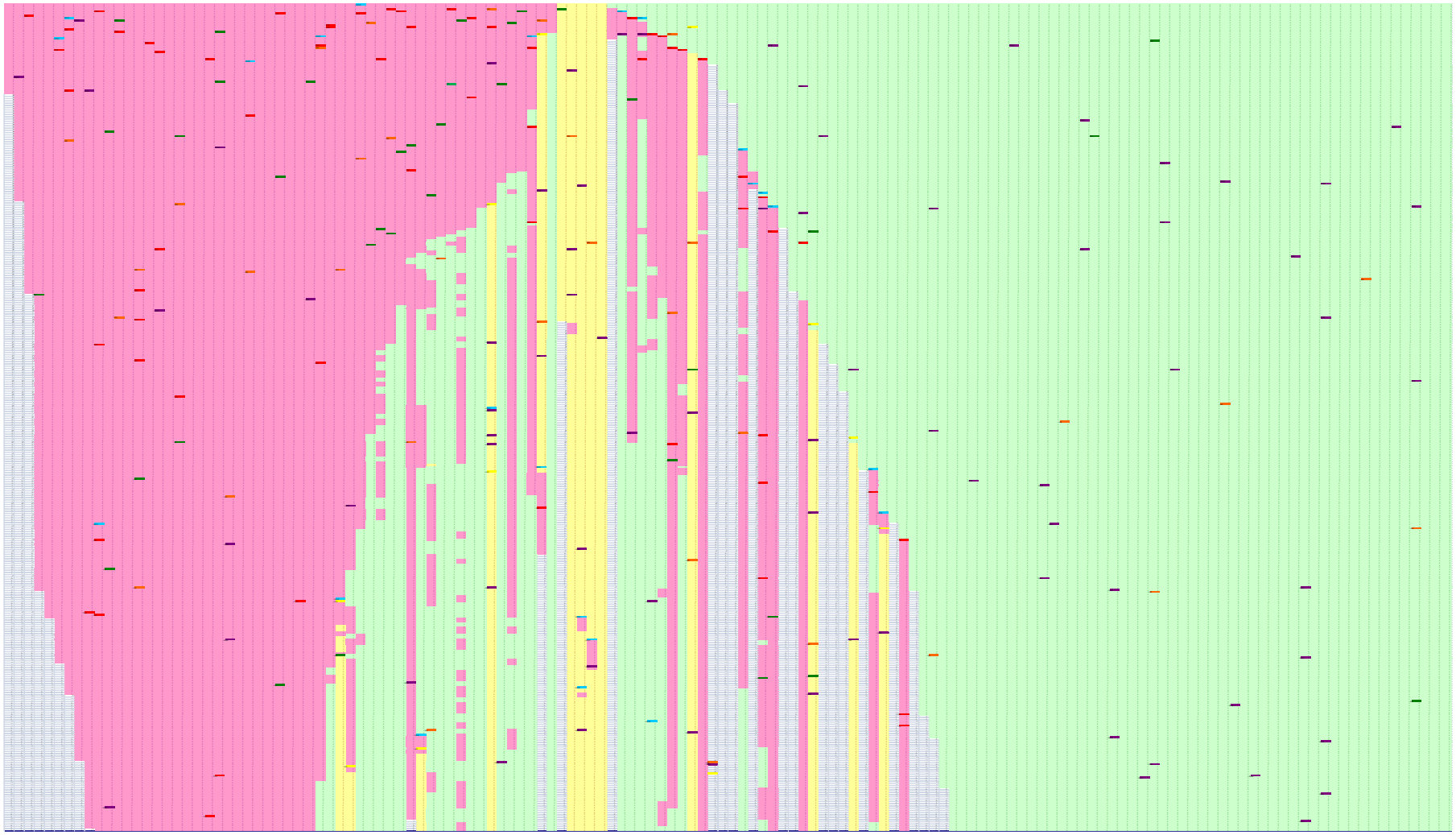
26 events, ½ within the first 66 days. None in ecAVG, 21 TCVC.

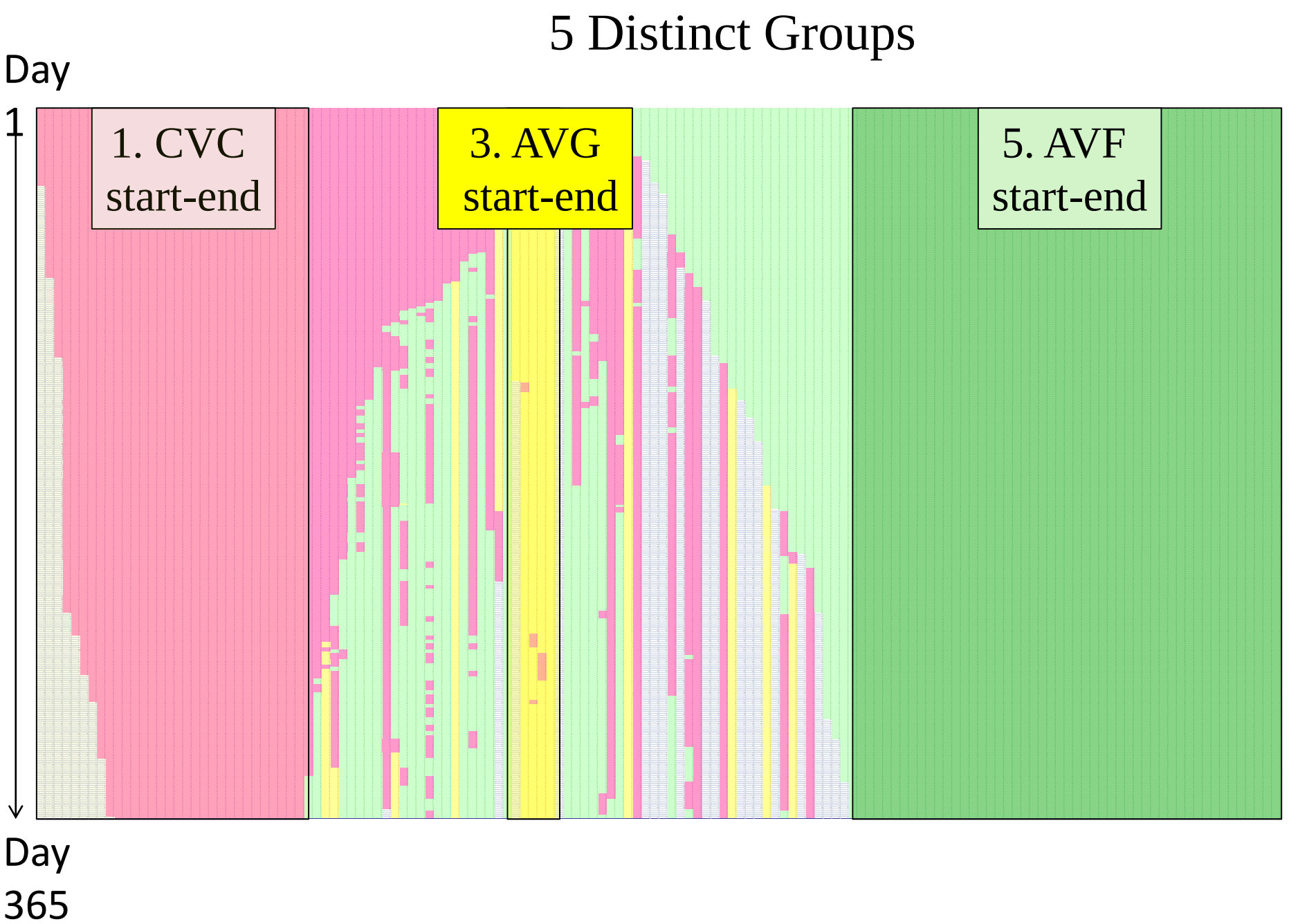
Admissions

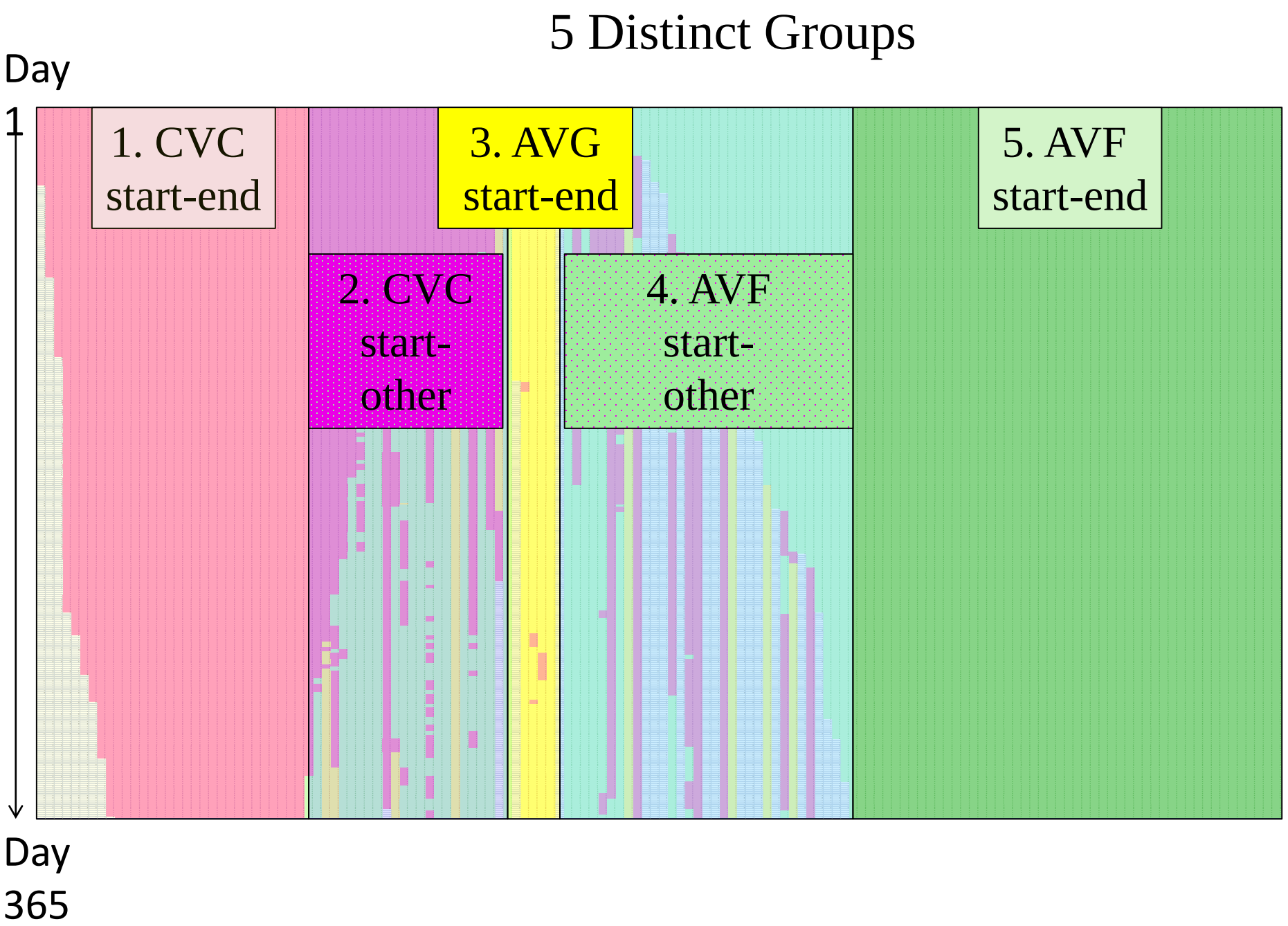


¼ of all HD was started as in-patient.

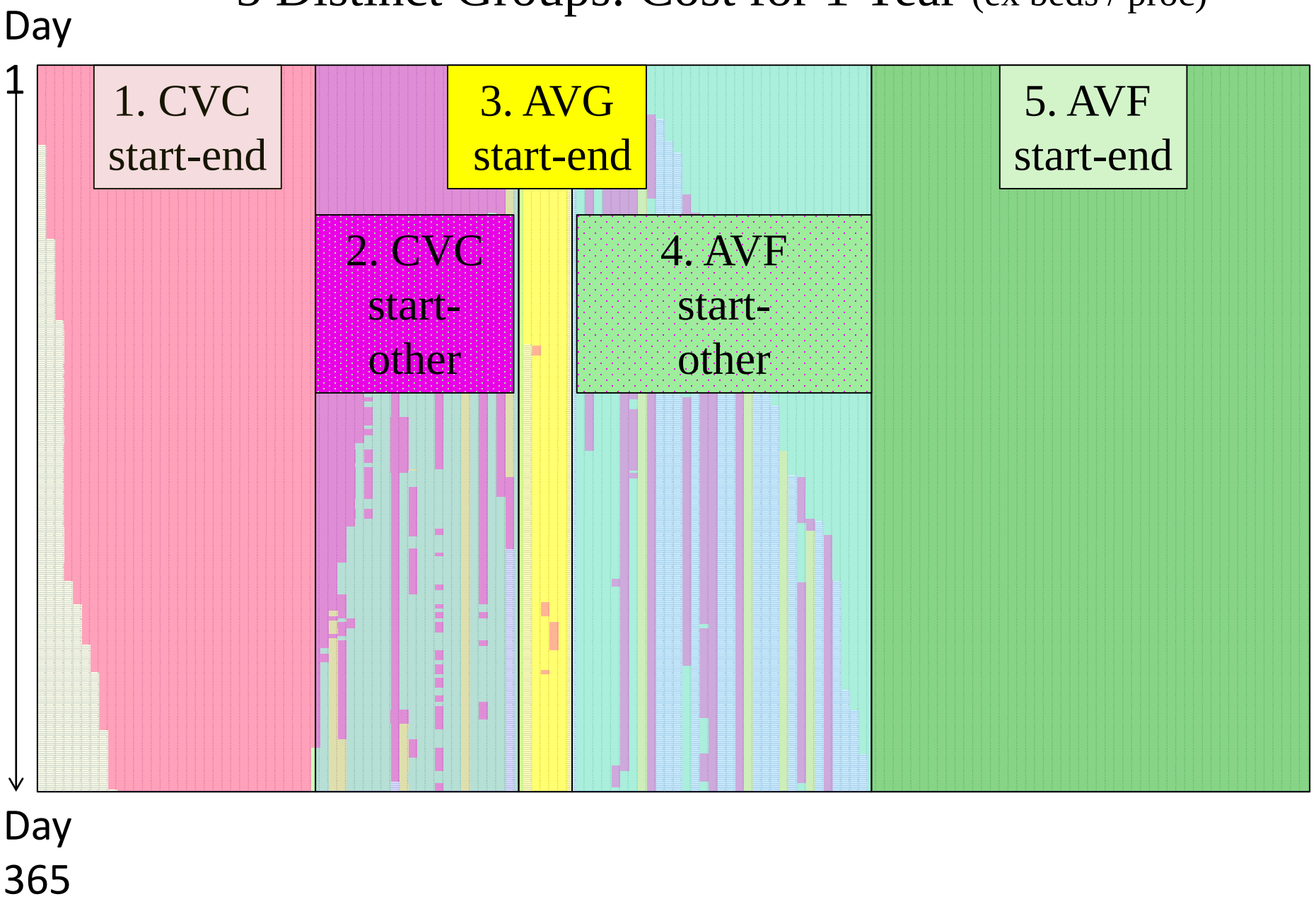
Surgery, Intervention and Imaging



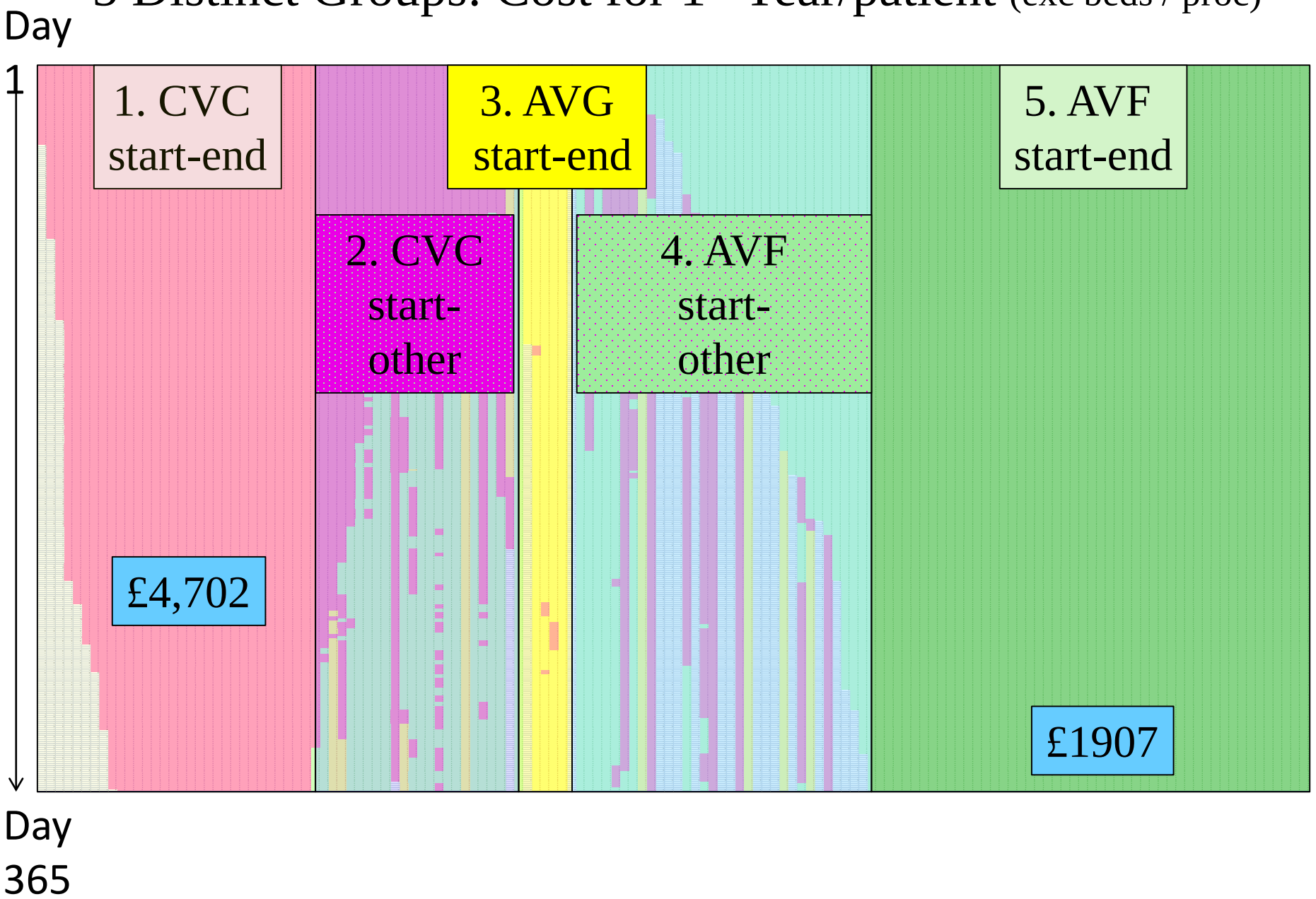

5 Distinct Groups
Day
1
1. CVC
start-end
3. AVG
start-end
5. AVF
start-end
Day
365


5 Distinct Groups
Day
1
1. CVC start-end
3. AVG start-end
5. AVF start-end
2. CVC start-other
4. AVF start-other
Day
365

5 Distinct Groups: Cost for 1 Year (ex beds / proc)



5 Distinct Groups: Cost for 1st Year/patient (exc beds / proc)



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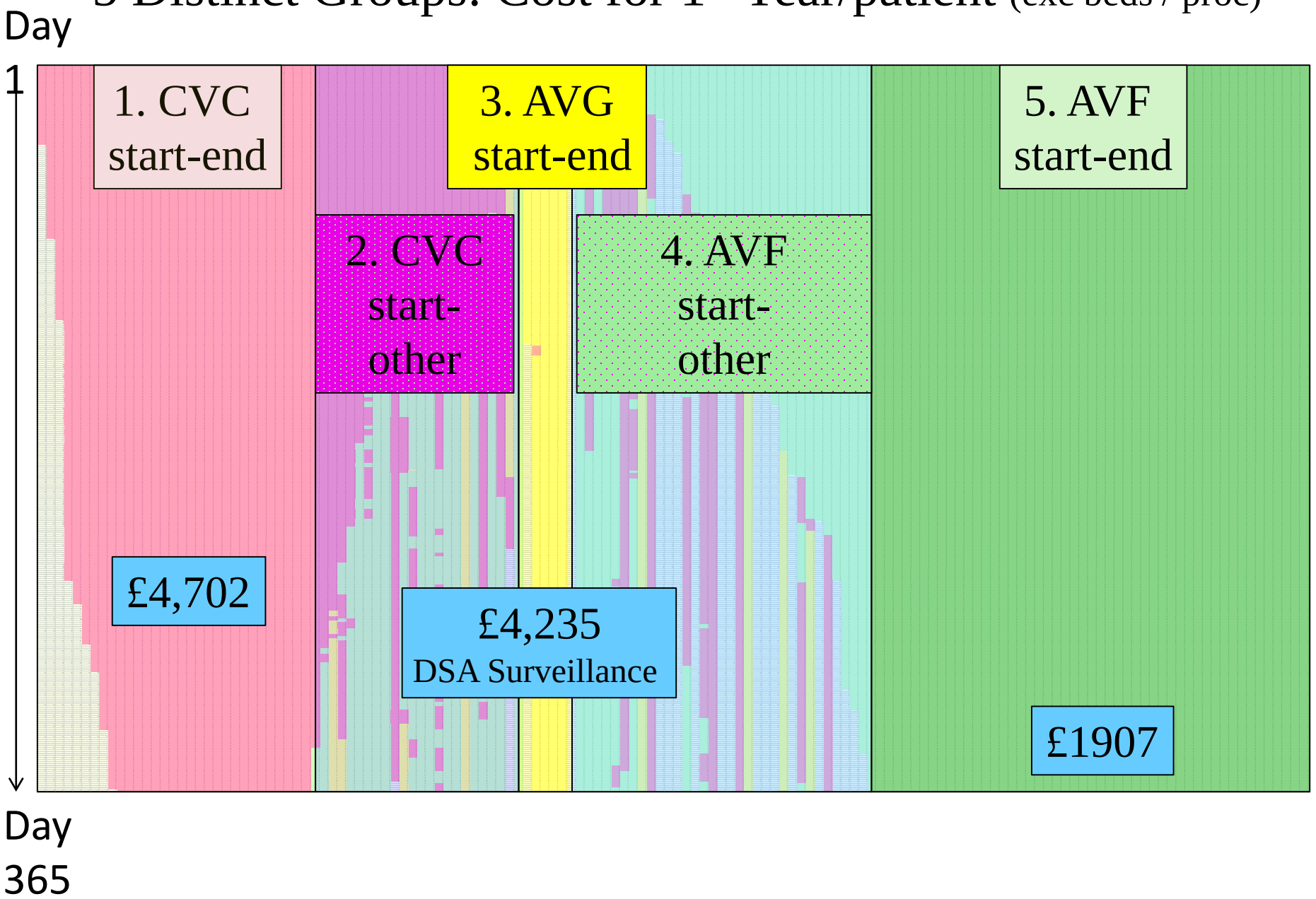

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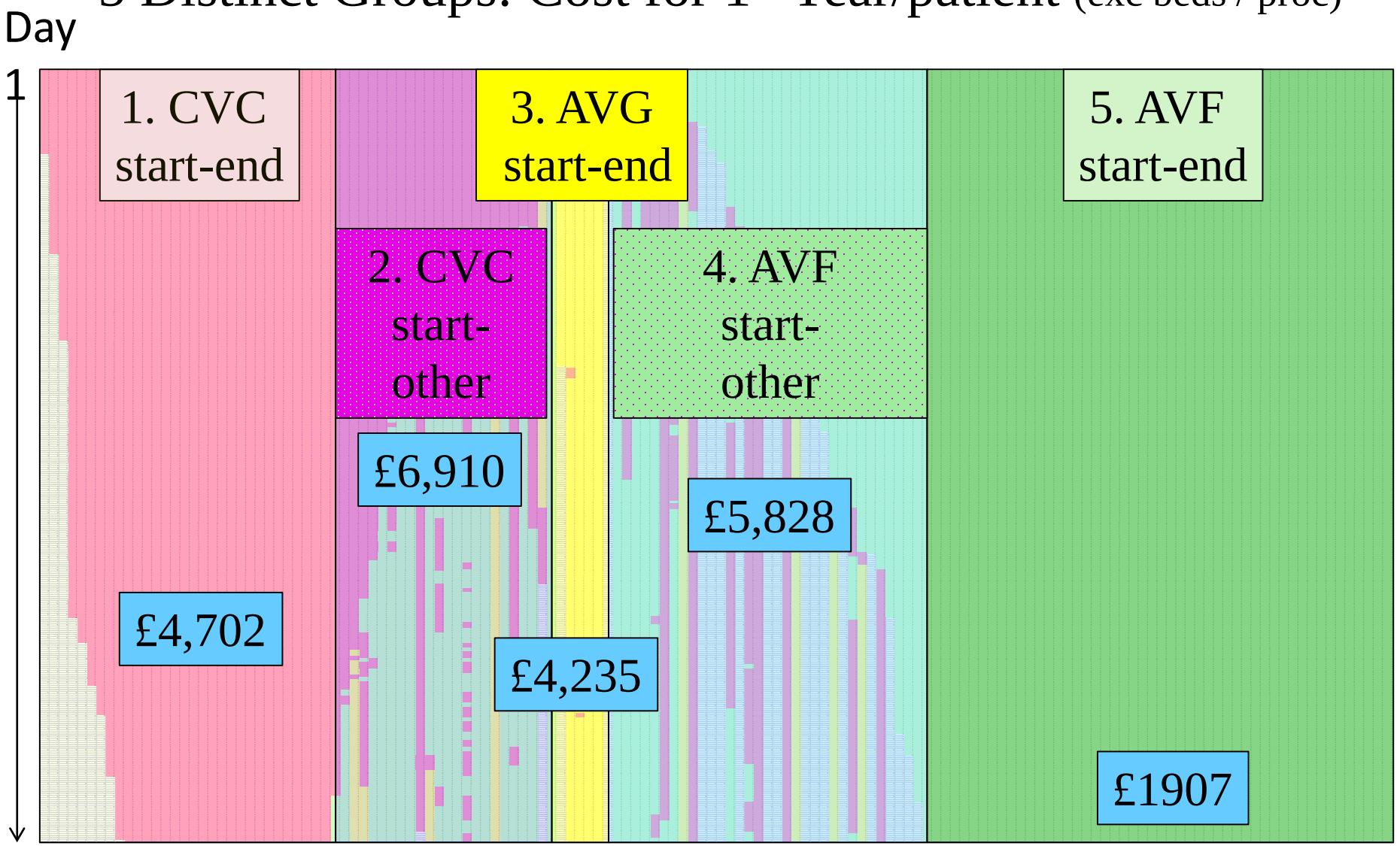


1. Same degree of price diff from RCT, 2. Failure is expensive

Summary: How I Use Early-Cannulation Grafts

ecAVG require a significant change to the ‘mind-set’ of a team:

- nephrology: timing of referrals, medical care (HD/meds/Bp)
- radiology: surveillance, type and timing of intervention
- surgery: timing el / emergency, case selection

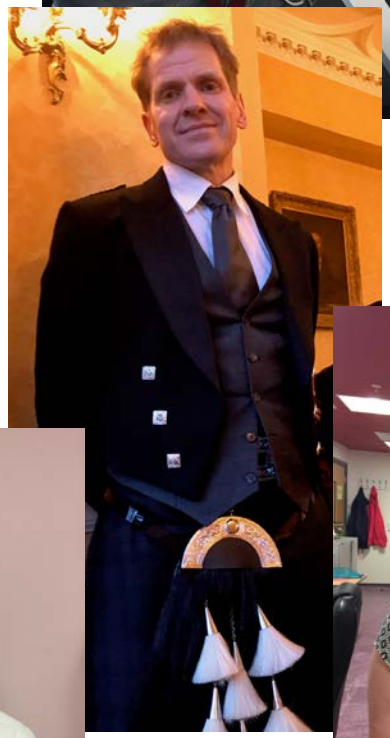
ecAVG represent a reliable cost-effective alternative to an uncertain traditional approach to vascular access.

The Team


K.Stevenson + Robbie


R.Kasthuri


P.Thomson




L.Bainbridge


M.Aitken


A.Jackson


Agata