

Public health referrals improve re-engagement for patients interrupting treatment

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Background

- Despite widespread access to antiretroviral (ART) in British Columbia (BC) Canada, treatment interruptions are common.
- In mid-2016, the BC HIV Drug Treatment Program (DTP) expanded its province-wide treatment interruption prescriber alert system.
- Direct referrals to public health offices for persons off treatment for >4 months were included for all British Columbians.
- We examined outcomes before and after launch of this Re-Engagement and Engagement in Treatment for Antiretroviral Interrupted and Naïve populations (RETAIN) Initiative.

Routine Public health referrals in addition to prescriber alerts for persons with ART interruptions >4 months shortened the length of ART interruptions and accelerated linkage to care.

Results

- 3219 ART Interruptions >2 months that triggered physician alerts were observed for 1805 patients in our study period.
- 2050 in the pre-RETAIN and 1169 in the post-RETAIN periods.
- Patients were predominantly male (74%), had a median duration of ART of 5 years and with a median age of 47 (Table 1).
- We found no differences between the two periods in terms of persons who re-started ART within 4 months of a physician alert or achieved viral suppression within six months.
- Among persons who re-initiated ART >4 months following the initial alert, the median (Q1-Q3) time to ART restart declined significantly from 9 (6-15) months pre-RETAIN to 7 (6-11) months post-RETAIN ($p=0.004$), possibly influenced by public health intervention.
- Interruptions in the post-RETAIN era were more likely to re-start ART (adjusted hazard ratio 1.50; 95% CI 1.34 - 1.69). ART re-initiation was associated with pVL suppression prior to interruption and ART duration prior to interruption (Table 1.) Similar findings were also found when examining only the first interruption in our study period.

Methods

- We analyzed adults with ART interruptions triggering a physician-directed alert (ART refill >2 months late) in pre-RETAIN (Jul-2013 to Apr-2016) and post-RETAIN (May-2016 to Oct-2017) periods.
- Follow-up continued until Oct-2018.
- Our analysis excludes persons who moved, died, or were shown to be on ART through alternative sources.
- We compared the proportion of persons who were linked to care, re-started ART, or achieved viral suppression (pVL <200 copies per mL) in the pre- and post-RETAIN periods and the time to ART re-initiation using generalized estimating equation.
- Cox modelling has been used to examine associations between time to ART restart with time period (pre-RETAIN vs. post-RETAIN) as our primary explanatory variable.

Table 2. Multivariable Cox Proportional Hazards model - time to ART re-engagement following a physician-directed therapy interruption alert

Variable	Interruption alerts sent to physicians		ART re-engagement before end of follow-up
	Total Alerts sent	n (%) of total Alerts sent	Hazard Ratio (95% CI)
Period	3219		
Pre RETAIN (July 01, 2013 to April 30, 2016)		2050 (63.7)	REF
Post RETAIN (May 01, 2016 to October 31, 2017)		1169 (36.3)	1.51 (1.34-1.69)
Sex	3219		
Female		813 (25.3)	REF
Male		2371 (73.7)	0.89 (0.78-1.02)
Other		35 (1.1)	1.02 (0.56-1.87)
HIV Risk Factor	3219		
MSM		739 (23.0)	REF
IDU		1104 (34.3)	1.09 (0.93-1.29)
Heterosexual		279 (8.7)	0.91 (0.73-1.14)
Other		16 (0.5)	1.51 (0.87-2.60)
Unknown		775 (24.1)	0.96 (0.81-1.15)
pVL (last before alert send date)	3219		
Unsuppressed (≥ 200 c/mL)		970 (30.1)	REF
Suppressed (<200 c/mL)		2248 (69.8)	1.37 (1.22-1.55)
Unknown		1 (0.0)	
Adherence in the one year before last ART stop date	3219		
$\leq 95\%$		2360 (73.3)	REF
> 95%		632 (19.6)	0.67 (0.58-0.77)
Unknown		227 (7.1)	0.63 (0.52-0.77)
Months from last pVL test date to the alert sent date (median (Q1-Q3))	3218	3 (2-5)	0.91 (0.89-0.92)
ART duration (years) before the current interruption (median Q1-Q3)	3219	5 (2-9)	1.05 (1.04-1.07)

Table 1. Descriptive characteristics of ART-treated persons with a suspected treatment interruption triggering a physician-directed Alert

		Overall (N=3219)		Pre RETAIN July 1, 2013 to April 30, 2016 (N=2050)		Post RETAIN May 1, 2016 to October 31, 2017 (N=1169)		P-value
		N	(%)	N	(%)	N	(%)	
Gender	Female	813	(25)	521	(25)	292	(25)	0.927
	Male	2371	(74)	1506	(73)	865	(74)	
	Other	35	(1)	23	(1)	12	(1)	
Rural	No	2968	(92)	1890	(92)	1078	(92)	0.924
	Yes	199	(6)	126	(6)	73	(6)	
	Unknown	52	(2)	34	(2)	18	(2)	
HIV exposure category	MSM	739	(23)	449	(22)	290	(25)	0.012
	IDU	1104	(34)	738	(36)	366	(31)	
	MSM and IDU	306	(10)	206	(10)	100	(9)	
	Heterosexual only	279	(9)	168	(8)	111	(9)	
	Other	16	(0)	8	(0)	8	(1)	
Unknown	775	(24)	481	(23)	294	(25)		
CD4 count prior to ART interruption	< 200	516	(16)	325	(16)	191	(16)	0.015
	200 - 350	658	(20)	451	(22)	207	(18)	
	> 350	2039	(63)	1269	(62)	770	(66)	
	Unknown	6	(0)	5	(0)	1	(0)	
Viral load prior to ART interruption	Unsuppressed (≥ 200 copies/mL)	970	(30)	630	(31)	340	(29)	0.334
	Suppressed (<200/ copies/mL)	2248	(70)	1419	(69)	829	(71)	
	Unknown	1	(0)	1	(0)			
Any previous ART interruption ≥ 90 days	No	960	(30)	637	(31)	323	(28)	0.087
	Yes	2259	(70)	1413	(69)	846	(72)	
Age at time of interruption alert	Median (Q1-Q3)	47 (39-54)		48 (40-54)		47 (38-54)		0.176
	ART duration before interruption alert (yr)	5 (2-9)		5 (2-9)		5 (3-9)		