San Diego Health

The Role of the Clinical Pharmacist in Treatment of HIV

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tline

History of clinical pharmacy services at UC San Diego

Role of clinical pharmacist and impact on outcomes

- Adherence counseling
- Side effect management
- ARV resistance
- Comorbidities
- Aging Population
- Medication access
- HCV Co-infection
- Opioid Substitution
- Aging Population
- PrEP/PEP
- Training/Education

C San Diego Owen Clinic – Retro clinic

- Developed current practice site during specialty residency year as research project/pilot project 1987 to 1988

- Research project: Development and Implementation of a Pharmacist Directed Zidovudine Monitoring Clinic

- Pharmacist in current position since 1988 at C San Diego Medical Center Owen Clinic as V Pharmacotherapy Specialist

etro Clinic – Current Model

2 full time pharmacists embedded within the clinic

- Consult service within the clinic – patients referred to pharmacist clinic for any medication related issues

Independent schedule seeing patients 9am – 5pm five days a week

- Established Owen clinic patients with medication related issues
- Hospital discharges
- New patients establishing care at Owen clinic

Collaborative Practice Protocol gives prescribing authority

Training site for UCSD School of Pharmacy – residents and 4th year pharmacy students

eatment of HIV

tcomes of pharmacist-assisted management of antiretroviral erapy in patients with HIV infection: A risk-adjusted analysis

Noah Nevo, Catherine R. Lesko, Bradford Colwell, Craig Ballard, Stephen R. Cole, and Christopher Mathews

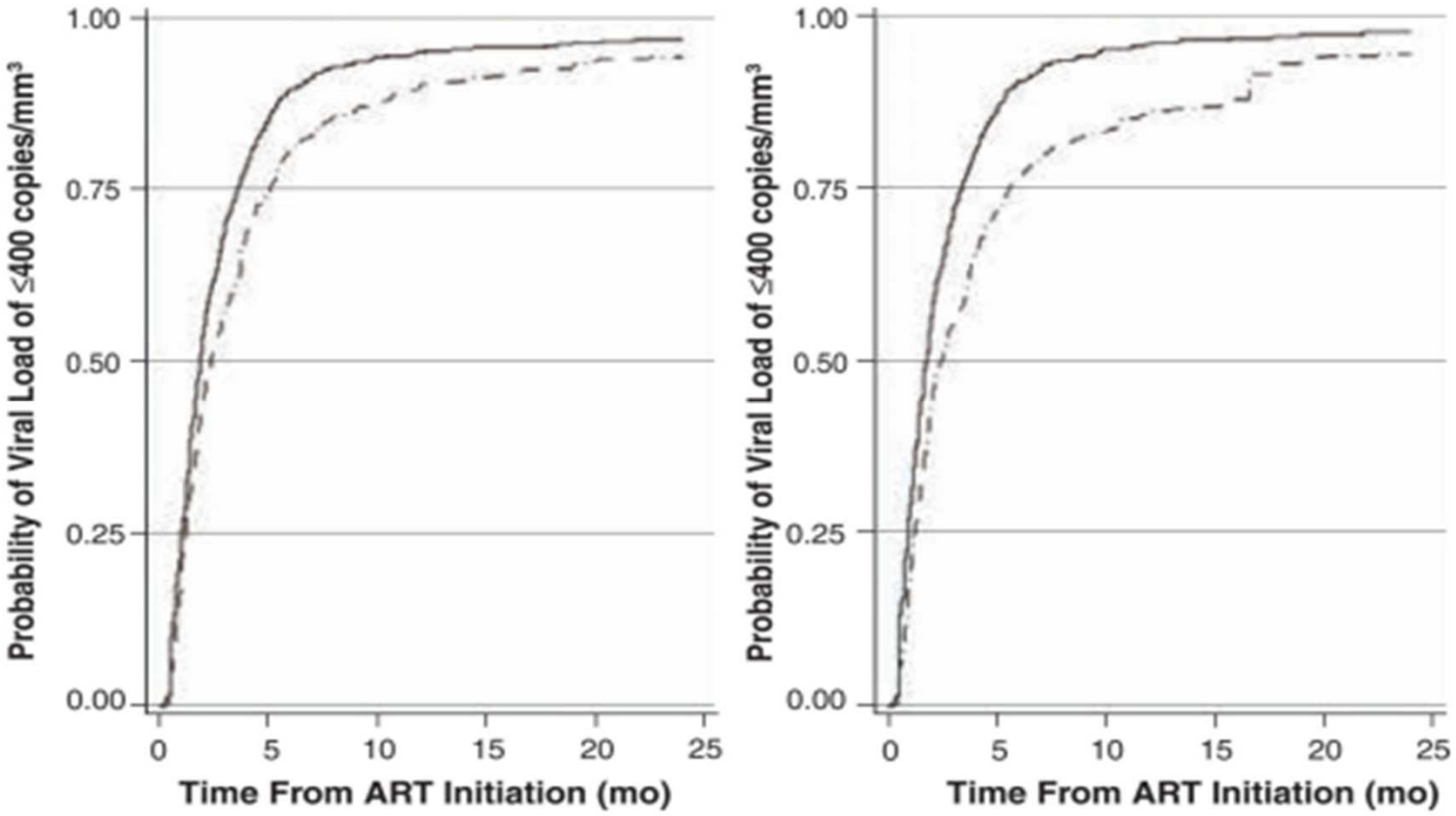
Comparison of time to viral suppression in 819 treatment naïve patients referred to the pharmacist clinic for ARV initiation to 436 patients started on ARVs without pharmacist assistance from 1999-2013

Secondary endpoints included time to first regimen change or discontinuation, prescribing patterns over time by drug class, and proportion of patient referred for pharmacist assistance by calendar year

Baseline characteristics between the two groups were similar except the pharmacist assistance group was older (median age 37.7 vs. 35.3, p=0.0001), had higher median baseline HIV viral loads (4.9 vs 4.7 $\log_{10}$ copies/mm^3, p=<0.00001), had lower median CD4+ cell counts (234 vs. 371 cells/$mm^{3,}$ p<0.0001), had a higher proportion of HCV Ab positive patients (11% vs. 7%, p=0.034), had a higher proportion of patients managed by a midlevel practitioner (49% vs. 25%, p=<0.00001), and a higher proportion of non-white patients.

Nevo N, Lesko C, Colwell B, et al. Outcomes of pharmacist-assisted management of antiretroviral therapy in patients with HIV infection: A risk-adjusted analysis. *Am J Health Syst Pharm.* 2015; 72: 1463-1470.

npact of pharmacist involvement in treatment naive



Median duration of first regimen was 100 months for the pharmacist assisted group and 44 months for the control group

dherence and Clinical Outcomes

Saberi P et al. *Patient Prefer Adherence.* 2012;6:297-322 – Systematic review of pharmacist impact on HIV treatment outcomes assessed 32 studies

- Among 10 publications in which the pharmacist's role was central, assignment to the pharmacist group was associated with improved adherence as compared to a control group and in 9 studies that had a pharmacist vs. control arm adherence was 2-59% (median 19%) higher in the pharmacist arm.

- Among 9 studies in which the pharmacists role was central, six showed association with pharmacist involvement and statistically significant viral load reductions.

- Favorable outcomes included increase in adherence to clinic appointments, reductions in variables such as hospitalizations, ARV toxicity scores, physician office visits, number of hospital days, emergency department visits, pill burden, and daily dosing frequency.

Saberi P, Dong BJ, Johnson MO, et al. The impact of clinical pharmacists on HIV treatment outcomes: a systemic review. *Patient Prefer Adherence.* 2012;6:297-322.

anagement of Antiretroviral Resistance testing and interpretation

Owen Clinic Model

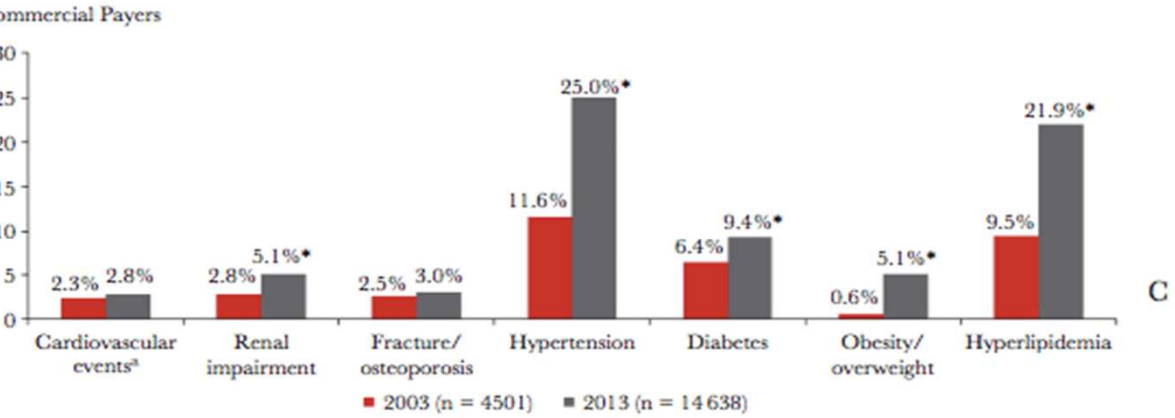
- Ordering of resistance testing centralized with pharmacist
  - Consult in appropriateness of testing, type of resistance test, insurance coverage
- Centralized location of resistance test results
- Interpretation and adjustment in ARV regimen based on resistance test results

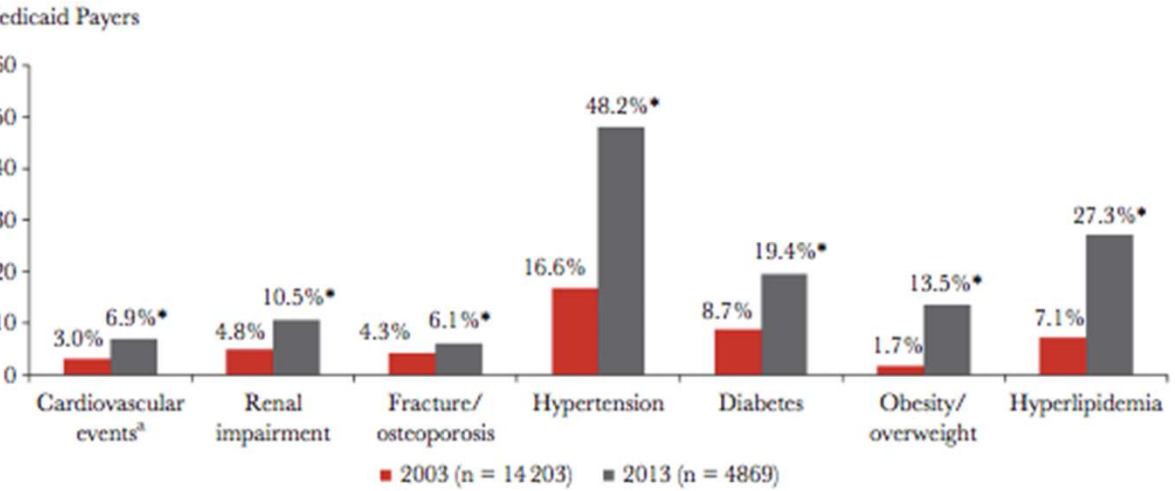
Dong BJ et al. *J Am Pharm Assoc.* 2017;57:516-519.

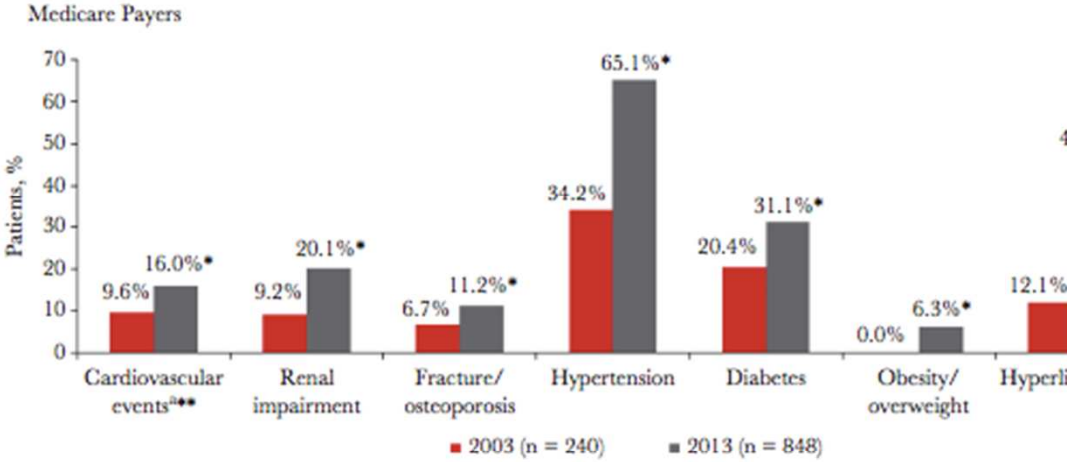
- Bureau of Corrections HIV clinical pharmacist consultants work in conjunction with the Clinician Consultation Center in managing difficult resistance cases
- Summary of 32 cases from 2010 – 2012
- Antiretroviral regimen change made in 87.5% of cases with a favorable viral load response i 89% and complete virologic suppression in 64% of cases

Dong BJ, Williams MR, Bingham JT, et al. Outcomes of challenging HIV case consultations provided via teleconference by the clinician consultation center to the federal bureau of prisons. *J Am Pharm Assoc.* 2017;57:516-519

anagement of Increasing Comorbidities







Gallant J, Hsue P, Shreay S, et al. Comorbidities among US patients with prevalent HIV infection-A trend analysis. *J Infect Dis.* 2017 Dec;2016:1525-1533.

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ging HIV population-Cohort of HIV patients 50 and older - UCSD

	Falls (+) (n=637)	No Falls (-) (n=1534)	Unadjusted p-value	Adjusted p-value	Odds Ratio (95% CI)
Total number of medications* (mean (95%CI))	11.2 (10.6-11.7)	7.5 (7.2-7.8)	**<0.0001**	**<0.0001**	**1.07 (1.05-1.10)**
Number with Polypharmacy (%)	519 (81.5)	1001 (65.3)	**<0.0001**	0.92	-
Number taking benzodiazepines (%)	92 (14.4)	218 (14.2)	0.89	-	-
Number taking Opioids	290 (45.5)	348 (22.7)	**<0.0001**	**<0.0001**	**2.05 (1.64-2.55)**
VACS score (mean)	36.1	29.5	**<0.0001**	**<0.0001**	**1.02 (1.01-1.03)**

Thai L, Hill L, Chamankah N, et al. The impact of number of medications on falls in aging persons living with HIV. *9th International Workshop on HIV and Aging.* September 2018. New York, NY.

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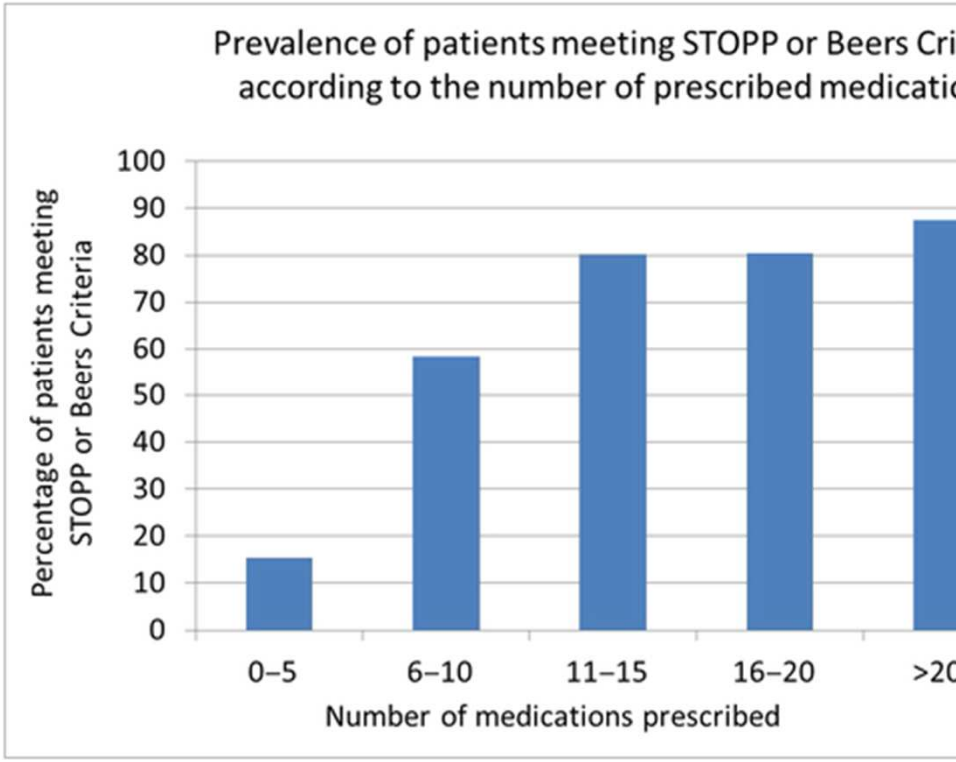
e-prescribing in Aging PLWH

McNicholl I, et al. *Pharmacotherapy.* 2017;37:1498-1506.

- 248 HIV patients age 50 years and older evaluated by pharmacists using Beers Criteria and STOPP to assess potentially in appropriate prescribing
- 56% had hypertension, 52% depression, 48% asthma/COPD, 39% dyslipidemia, 27% CAD, and 22% diabetes with a mean of 11.6+/-5.8 concomitant medications.
- Potentially inappropriate prescribing identified in 54% and 63% of patients using STOPP and Beers Criteria
- At least 69% had at least one medication discontinued with 10% having six or more medications medications discontinued, mean was 2.2



McNicholl I, Gandhi M, Hare CB, et al. A pharmacist-led program to evaluate and reduce polypharmacy and potentially inappropriate prescribing in older HIV-positive patients. *Pharmacotherapy.* 2017;37:1498-1506.

pioid use and medication assisted treatment

PLWH more likely to receive opioids and receive higher doses compared to uninfected individua

Proportion of PLWH receiving opioids estimated to be 21-53%

DiPaula et al. *J Am Pharm Assoc.* 2015;55:187-82.

- Ambulatory Care pharmacist-physician collaboration to perform opioid substitution maintenance therapy to low income patient population

Owen Clinic model

- Medication acquisition and diversion monitoring
- Contact for patients regarding questions/medication access
- Transition to Sublocade

Table 2. Outcomes of patients with opioid dependence cared for in collaborative care pilot project

Patient outcomes	No. (%)
Patients successfully progressed from weekly to monthly monitoring (n = 12)	6 (50)
Urine toxicology screen negative for opioids and positive for buprenorphine (n = 129)	114 (88)
Urine toxicology screens positive for buprenorphine (n = 129)	127 (98)
Patients retained in pilot (therapeutic taper excluded)	
6 months (n = 6)	6 (100)
12 months (n = 11)	8 (73)
Patients discharged because of nonadherence with contract	
6 months (n = 6)	0 (0)
12 months (n = 12)	3 (25)

Cunningham C. *Topics in Antiviral Medicine.* 2018; 25:143-146
DiPaula BA, Menachery E. Physician-pharmacist collaborative care model for buprenorphine-maintained opioid-dependent patients. *J Am Pharm Assoc.* 2015;55:187-92.

eatment of HIV/HCV coinfection

Olea A Jr. *Integr Pharm Res Pract.* 2018;7:105-111 – Role of clinical pharmacist in HIV/HCV treatment

- Med acquisition (91.8%)
- Adherence counseling (79.2%)
- Drug-drug interaction counseling and screening (54.2%) – ART changed in 23% of patients
- Adverse event counseling (54.2%)
- Disease state education and treatment outcome counseling (53.1%)
- Ordering and interpreting laboratory tests (44.8%)
- HIV medication adverse event assessment (54.2%)
- Refills and management of comorbidities (42.7%)

Olea A Jr, Grochowski J, Leutkemeyer AF, et al. Role of a clinical pharmacist as part of a multidisciplinary care team in the treatment of HCV in patients living with HIV/HCV coinfection. *Integr Pharm Res Pract.* 2018 Aug;7:105-111.

edication Reconciliation

Essential part of all pharmacy visits

Patients with large number of medications referred specifically for med reconciliation

Essential that patients bring all medications to visit

Important part of transitions of care

Eginger KH, et al. *Ann Pharmacother.* 2013;47:953-60. – Med reconciliation by pharmacist at hospital admission

- Medication error present in 54.7% of patients reviewed (n=86)

Table 3. Total HAART Errors at Admission[a]

Error Type	Errors, n (%)
Omitted dose	78 (45.3)
Incorrect dose	30 (17.4)
Incomplete regimen	25 (14.5)
Incorrect regimen	18 (10.5)
Not adjusted for renal function	11 (6.4)
Drug-drug interaction	6 (3.5)
Duplication of therapy	3 (1.7)
Not adjusted for hepatic function	1 (0.6)

HAART = highly active antiretroviral therapy.
[a]N = 172.

Table 4. Total Opportunistic Infection Prophylaxis Errors at Admission[a]

Error Type	Errors, n (%)
Omitted dose	22 (57.9)
Incomplete regimen	11 (28.9)
Incorrect dose	3 (7.9)
Not adjusted for renal function	1 (2.6)
Drug-drug interaction	1 (2.6)

[a]N = 38.

Eginger KH, Yarborough LL, Inge LD, et al. Medication errors in HIV-infected hospitalized patients: a pharmacist's impact. *Ann Pharmacother.* 2013;47:953-60. ,

roviding education

- Rotation site for both fourth year pharmacy students
d 1st and 2nd year pharmacy residents

- Assistance with medication reconciliation and
edication access

- Experience working with diverse patient population

- Experience being part of a multidisciplinary team

- Environment for optimizing patient interactions, clinical skills, and developing patient relationshi

roviding Pre-exposure prophylaxis

Varying roles for pharmacists

- Medication acquisition and reduction in cost
- Medication counseling and education
- Adherence monitoring
- Monitoring need for follow up testing
- STI treatment

Tung, EL, et al. *Sex Health*. 2018;15:556-561.

- Pharmacist-managed PrEP clinic in a community pharmacy setting
- In three year time 695 patients initiated PrEP
- No HIV seroconversions with 90% of patients having mean proportion of days covered grea than 80%
- 19% lost to follow up

edication Access

- Assist patients navigate complicated healthcare system
- Medication access for uninsured
- Resource regarding different formulary requirements and cost reduction options
- Introduction of more generics into the marketplace
- Access to infusions
- Soon to come long acting injectables

ummary

- Literature demonstrates improved HIV related outcomes with pharmacist involvement in regime selection, education, adherence monitoring, and management of resistance
- Pharmacists have a significant role to play in management of comorbidities including opioid abu and HIV/HCV coinfection
- Increased need for accurate medication reconciliation and pharmacist involvement with the agi HIV population
- Medication access will be an ongoing issue for future therapies
- Pharmacists should be heavily involved in HIV prevention and PrEP