
UCLA Anticoagulation Management Service Time in Therapeutic Range by Type of INR Monitor and Challenges with Transitions of Care

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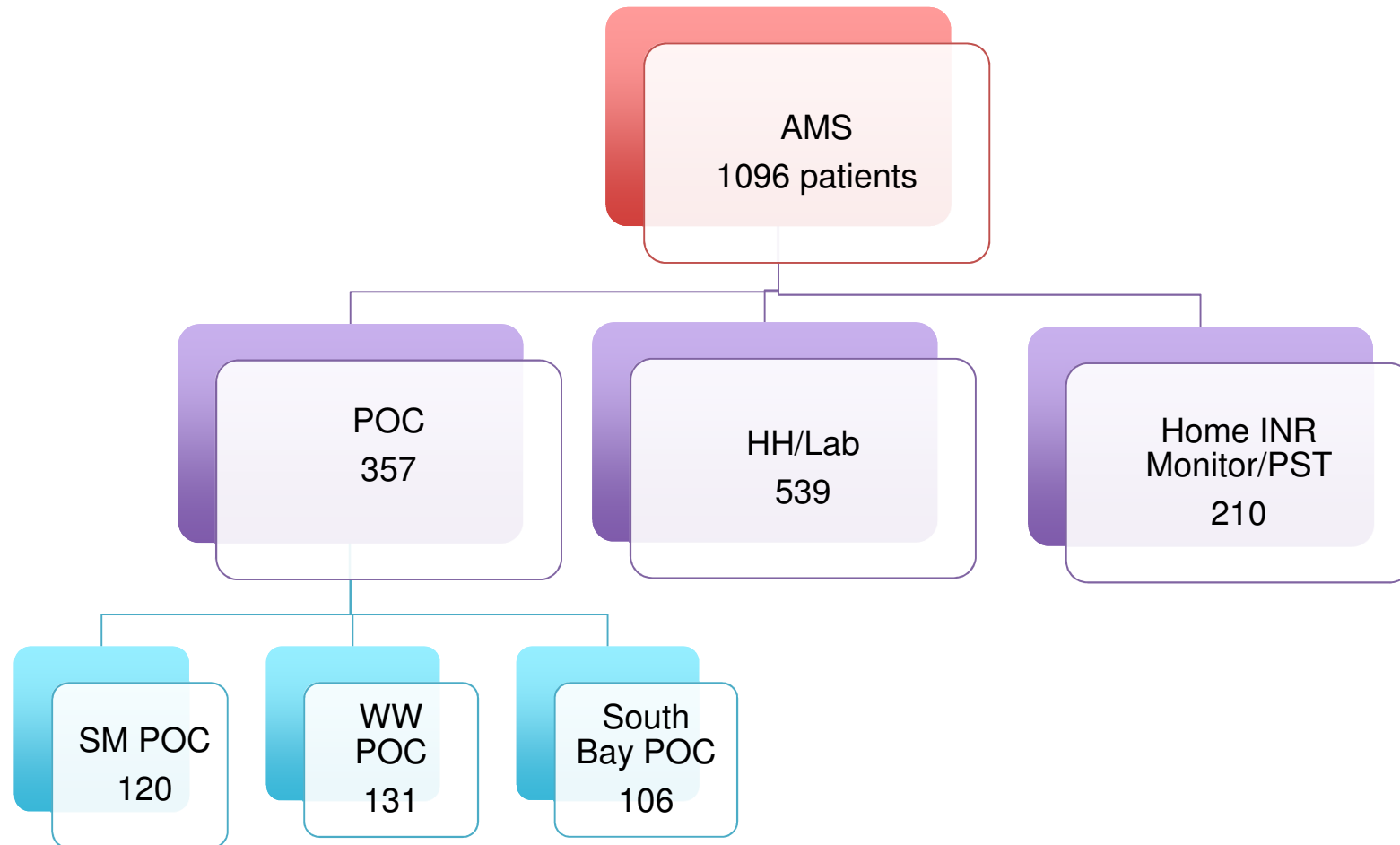
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Overview

- Scope and procedures of the UCLA Anticoagulation Management Service (AMS)
- UCLA AMS patient time in therapeutic range (TTR) by AMS clinic type and age
- Case study to investigate problems with transitions of care
- Potential solutions to improve post discharge communication



UCLA Anticoagulation Management Service



Procedures: Point of Care (POC)

- Patients have scheduled clinic visits
- Patients fill out a questionnaire at check in
- POC INR test done
- DAWN AC generates dosing instructions (MD involvement if out of protocol)
- Patients leave with a sheet that has specific dosing instructions and an a scheduled date for next POC test



Procedures: Home Health (HH)

- INR data received via fax and filtered by AMS staff.
- AMS staff phone patient to verify dosing and any possible changes effecting warfarin.
- DAWN AC generates dosing instructions and these are verbalized via phone to patient. Reviewed by MD if out of protocol.
- AMS staff faxes orders for date of next INR check.

Procedures: Lab

- Patients go on their own to a designated lab for INR check.
- AMS receives INR data either interfaced directly into DAWN AC or fax.
- AMS staff phone patient to verify dosing and any possible changes effecting warfarin.
- DAWN AC generates dosing instructions and these are verbalized via phone to patient. Reviewed by MD if out of protocol.

Procedures: Home INR Machine/Patient Self Testing (PST)

- Patient self checks INR and notifies home monitor company who then faxes INR result to AMS clinic.
- AMS staff phone patient to verify dosing and any possible changes effecting warfarin.
- DAWN AC generates dosing instructions and these are verbalized via phone to patient. Reviewed by MD if out of protocol and patient is informed of next date to check INR.



Pros and Cons by INR Monitoring Type

	POC testing	HH Testing	Lab draw	Home machine/PST
Pros	<ul style="list-style-type: none"> • Face to face visit • Patient receives written instructions • MD available for patient education/questions • Finger stick 	<ul style="list-style-type: none"> • Do not have to leave the home 	<ul style="list-style-type: none"> • INR result inputted to DAWN directly if done at UCLA 	<ul style="list-style-type: none"> • Convenient • Finger stick • Improved quality of life
Cons	<ul style="list-style-type: none"> • Time consuming • Costly (parking, co-pay time off work) • Only during business hours 	<ul style="list-style-type: none"> • Dependent on agency • Involves phlebotomy • Turnaround on lab results longer • Faxes more unreliable 	<ul style="list-style-type: none"> • Patients may be less reliable about getting INR done on specified date • Involves phlebotomy • If outside lab is used fax is more unreliable 	<ul style="list-style-type: none"> • Patient must make sure they have adequate supplies for testing • Cost associated with supplies may vary



Question

- Do UCLA AMS patients with home monitoring/PST spend more TTR than HH/Lab or POC monitored patients? Does age make a difference?



What is the Evidence? PST vs HQACM Clinic

- VA Cooperative Study #481: The Home INR Study (THINRS).
 - 6 VA centers across the US
 - 1029 patients with AF or MHV trained and tested ProTime INR meter
 - 787 deemed competent randomized 4 arms (HQACM clinic- testing q 4 weeks, telephone PST q4 weeks, weekly, and twice weekly)
 - Endpoint was TTR at 1 yr.
 - TTR increased as testing frequency increased for those in PST
 - Q4 weeks 59.9%, Q week 63.3%, Q twice weekly 66.8%
 - TTR for patients in HQACM arm was 60.8%
 - Rates of major events (death, major bleed, stroke) not significantly different across the four groups.

Matchar et al. J Thromb Thombolysis 2015



What is the Evidence? PST vs HQACM Clinic

- This is consistent with the parent study which did not show a difference in death, major bleed or stroke in patient who performed weekly self testing compared to monthly HQACM testing. ¹
- Self testing is associated with an improved quality of life (improved quality of life in 87% of patients who performed PST vs. conventional in clinic monitoring) ²
- Weekly PST is a cost effective alternative to HQACM clinic ³
- Meta-analysis: PST with or without PSM is associated with fewer deaths and thromboembolic events, without increased risk for a serious bleeding event compared to usual care (in a highly selected group of motivated adult patients).⁴

1. Matchar et al N Engl J med. 2010.

2. Barcellona et al. Patient Prefer Adherence. 2018

3. Phibbs et al. J Gen Intern Med. 2016

4. Bloomfield et al. Ann Intern Med. 2011



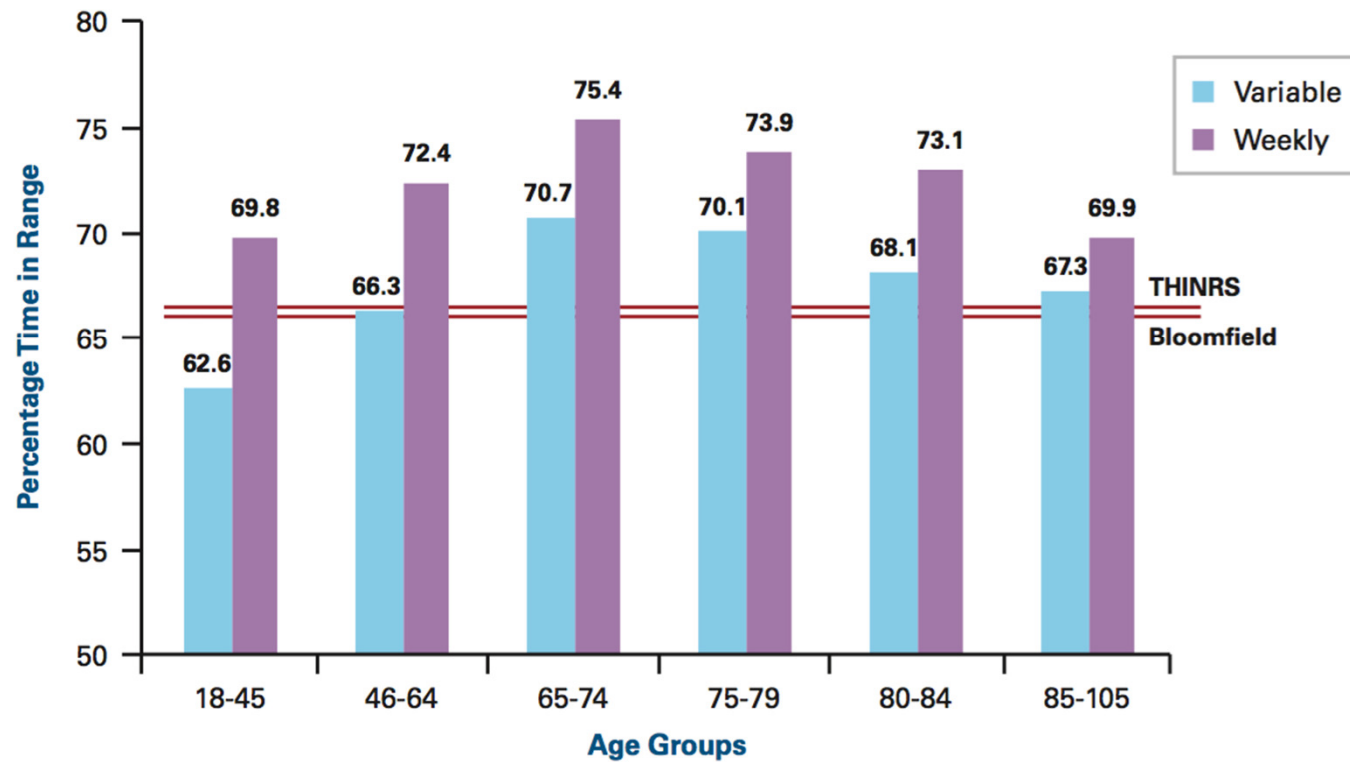
What is the evidence: STABLE Does age matter?

- Self-Testing Analysis Based on Long-term Evaluation (STABLE) retrospective cohort analysis of data from PST variable and weekly testing.
 - 29,547 patients (4,550 weekly PST, 24,907 variable PST)
 - Weekly PST had higher mean TTR (74% SD 15.1) compared to variable PST (68.9 SD 19.1)
 - Patients 75 years and older performed well with a mean TTR > 73% for weekly testers.

DeSantis et al. Am J Manag Care 2014

What is the evidence: STABLE Does age matter?

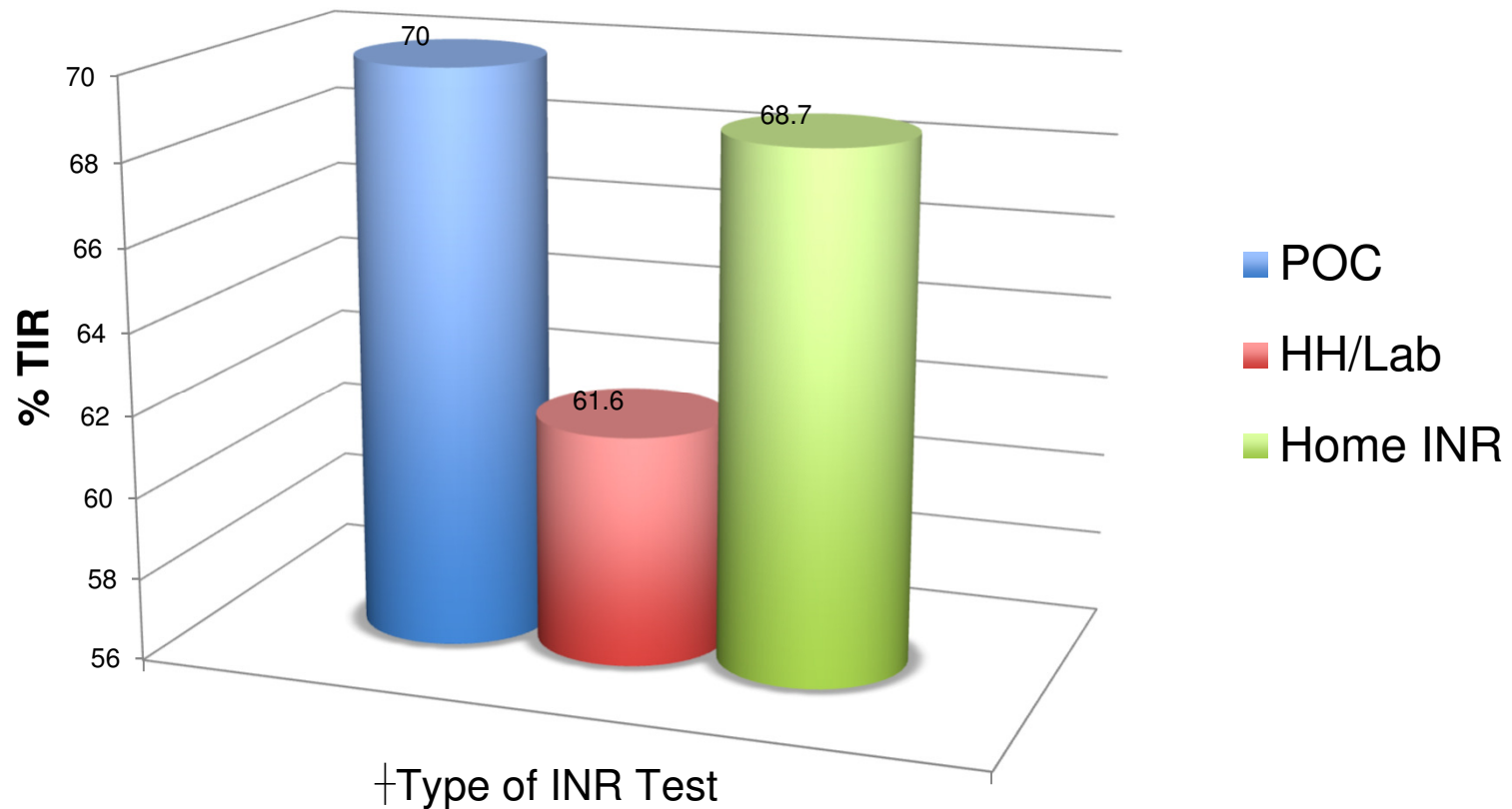
■ **Figure 2.** Time in Therapeutic Range (%) by Age Group



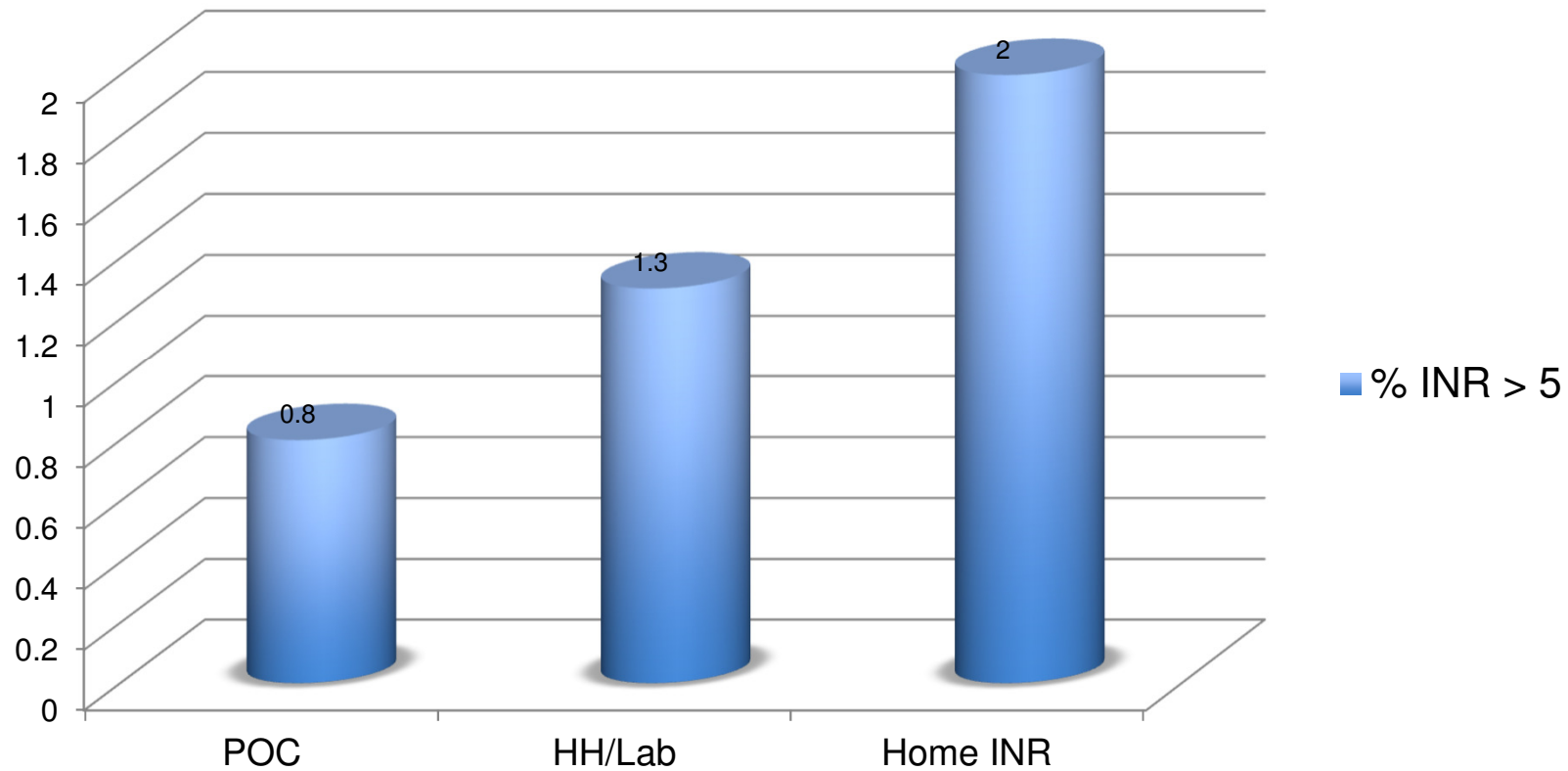
DeSantis et al. Am J Manag Care 2014



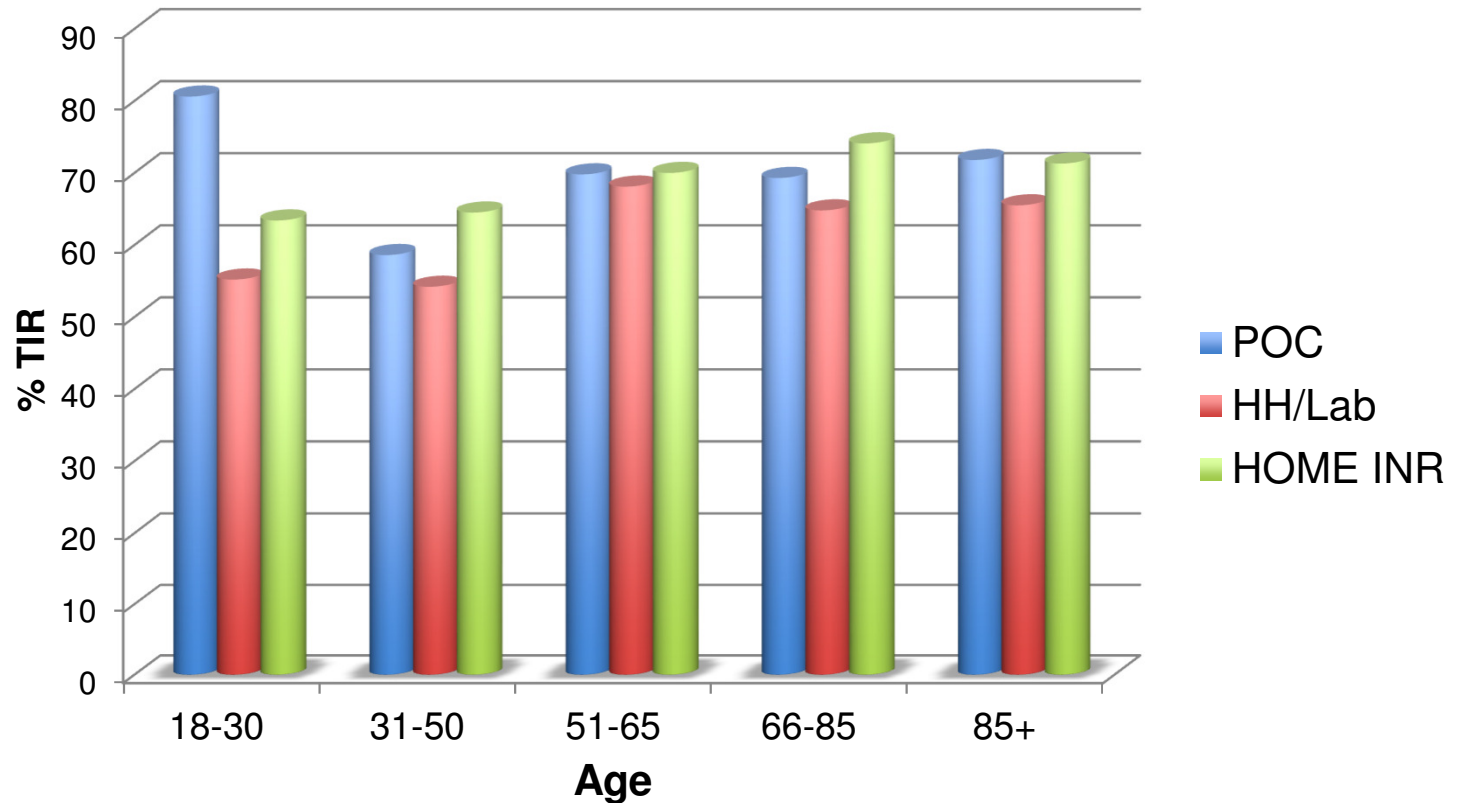
UCLA Data: % TTR by Location All Ages



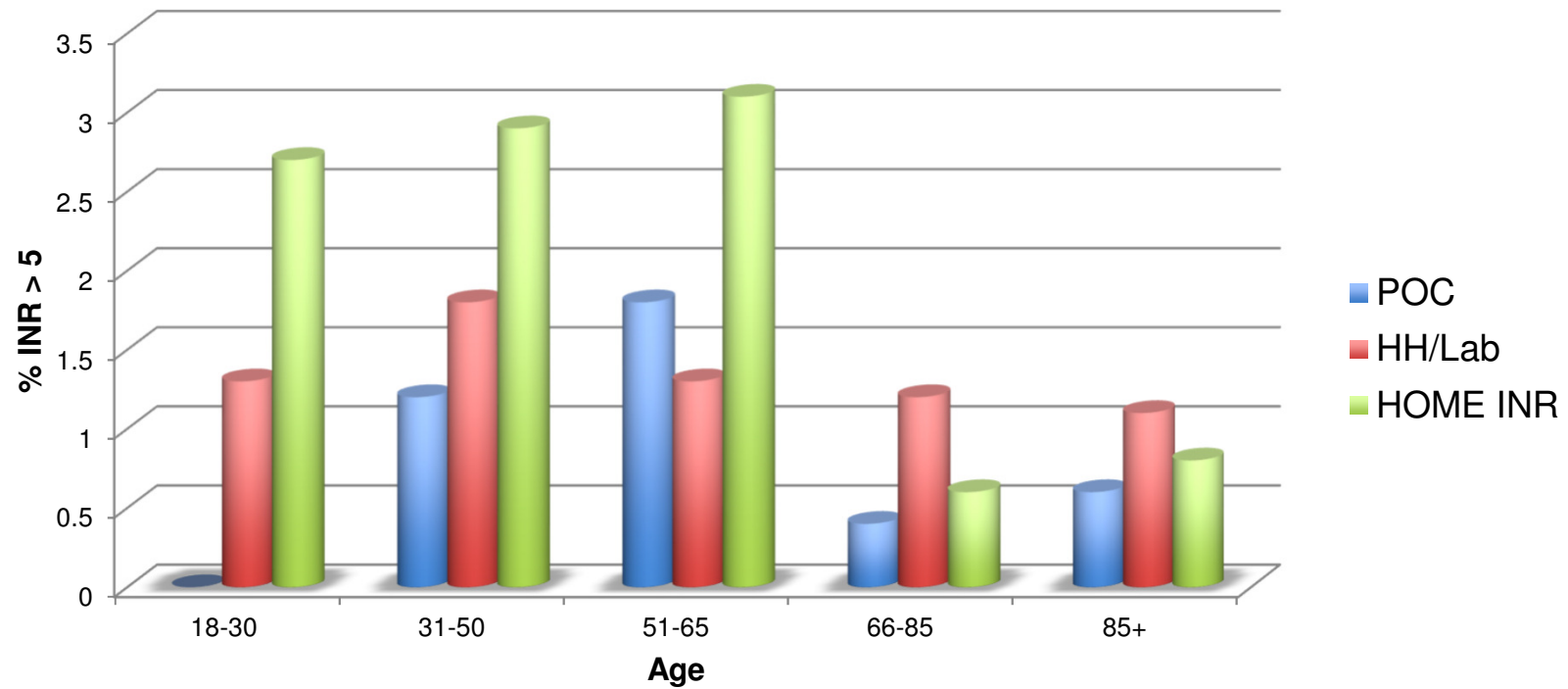
% INR > 5 All Ages



% TTR: Age and Location



% INR > 5: Age and Location



Conclusions

- UCLA POC patients and Home INR monitoring patients spend about the same amount of time in therapeutic range (70 and 68.7% respectively).
- HH/Lab INR monitored patients spent less TTR than patients who used a home INR monitor or came into the clinic for POC testing.
- Home INR monitored patients spent more time with INR > 5, whereas POC patients spent the least amount of time with an INR >5.
- Younger patients actually had more TTR with POC testing.



Transitions of Care:

- Hospital to home, hospital to skilled nursing facility (SNF), and SNF to home transitions are vulnerable periods for patients on warfarin due to medication errors, med-med interactions, and diet-med interactions.
- 30 day readmission rates for Medicare patients after discharge from inpatient rehabilitation facilities has been shown to be 13.1%¹
- Review of drug related hospital readmissions showed median prevalence 21%²
- Vitamin K antagonist were among the highest prevalence for drug group readmissions.²

1. Coots Daras et al. Arch Phys Med Rehabil. 2018

2. El Morabet et al. J Am Geriatr Soc. 2018



Transitions of Care: Interaction with AMS Clinic

- Patients hospitalized move from “Active” list to “Admitted” list via direct Care Connect-DAWN interaction.
- Inpatient warfarin dosing and management falls on the inpatient team (physicians or pharmacy)
- When patients are discharged from the inpatient setting, they automatically move to the “Discharged” list. AMS staff reviews discharge and coordinates INR check and moves patient to the “Active” list. If the patient was discharged to SNF, they change the clinic site to indicate that they are at a SNF.
- If patients are discharged to SNF, majority of the time SNF physicians manage patients INR.
- While at SNF patients are placed on a “Reminder” list. AMS does Q2 week checks with family or SNF re discharge.
- On average we have 10-20 AMS patients at SNF for short term rehabilitation.



Transitions of Care: Pitfalls

- Hospital to home:
 - Discharge summary not always accurate. “Copy forward”
 - AMS staff do not have access to the after visit summary (AVS) which lists doses of medications to take on discharge.
 - Medication changes and dietary changes from discharge place patients at high risk for med error and med-med or med-diet interactions which impact INR
- SNF to home:
 - AMS not always notified regarding patients discharge.
 - Current policy is to check Q2 weeks with patients on “reminder” list but patient may be discharged and already miss critical time frame for INR recheck.
 - Med changes and dietary changes from discharge place patients at high risk for med error and med-med or med-diet interactions which impact INR



Case Study: Mr. R.T. SNF Transitions of Care

- Mr. R.T. 95 year old male with a-fib (on warfarin), TIAs, aortic stenosis, BPH s/p TURP c/b urinary retention requiring chronic suprapubic catheter, T2DM, HTN, HLD, glaucoma, macular degeneration, and hearing loss.
- GLF on 7/13 s/p R hip hemiarthroplasty on 7/14 with hospital course c/b delirium. Discharged to SNF for deconditioning/PT on 7/18
- Discharged from snf back to assisted living facility (ALF) on 8/31 (INR 8/30 was 2.45) plan to repeat INR on 9/4 via HH.
- Pt was readmitted for frank hematuria on 9/9. INR was 4.1 which resolved w/ suprapubic cath exchange and holding warfarin.



Case Study: Mr. R.T. What went wrong?

- INR was ordered by SNF team on discharge but HH reported they never received orders for INR check.
- By the time patient showed up on the DNA list, they had already been readmitted.
- Patients post discharge appointment with pcp was scheduled after his INR was due.

Transitions of Care: Room for Improvement

- **Hospital to home:**
 - Improved access to AVS from hospital discharge to AMS clinic.
 - Program “hard stop” into discharge workflow for patients flagged as enrolled in AMS clinic.
- **SNF to home:**
 - Increase rate of “Reminder” list phone calls.
 - Enlist eligible providers to send message in care connect directly to AMS clinic on patient discharge.
 - AMS workflow to incorporate double-check system for HH orders for initial INR draw on discharge.



Summary

- UCLA AMS manages patients in various settings (POC, HH/Lab, and PST)
- UCLA AMS patient who are managed by POC and PST spent more TTR than HH/Lab tested patients.
- Transitions of care remain vulnerable times for patients who are managed with Vitamin K antagonist, and contribute to hospital readmissions.
- Potential solutions to improve post discharge communication and reduce rates of vitamin K antagonist related medication errors and readmissions.



Thanks to...

All our patients
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