期刊報告

藥物諮詢組 林昭怡藥師 2020.3.19

Am J Health-Syst Pharm. 2020; 77:22-32

PRACTICE RESEARCH REPORT

Reporting of adverse drug events in the Veterans Health Administration for patients whose treatment with empagliflozin or apixaban was discontinued

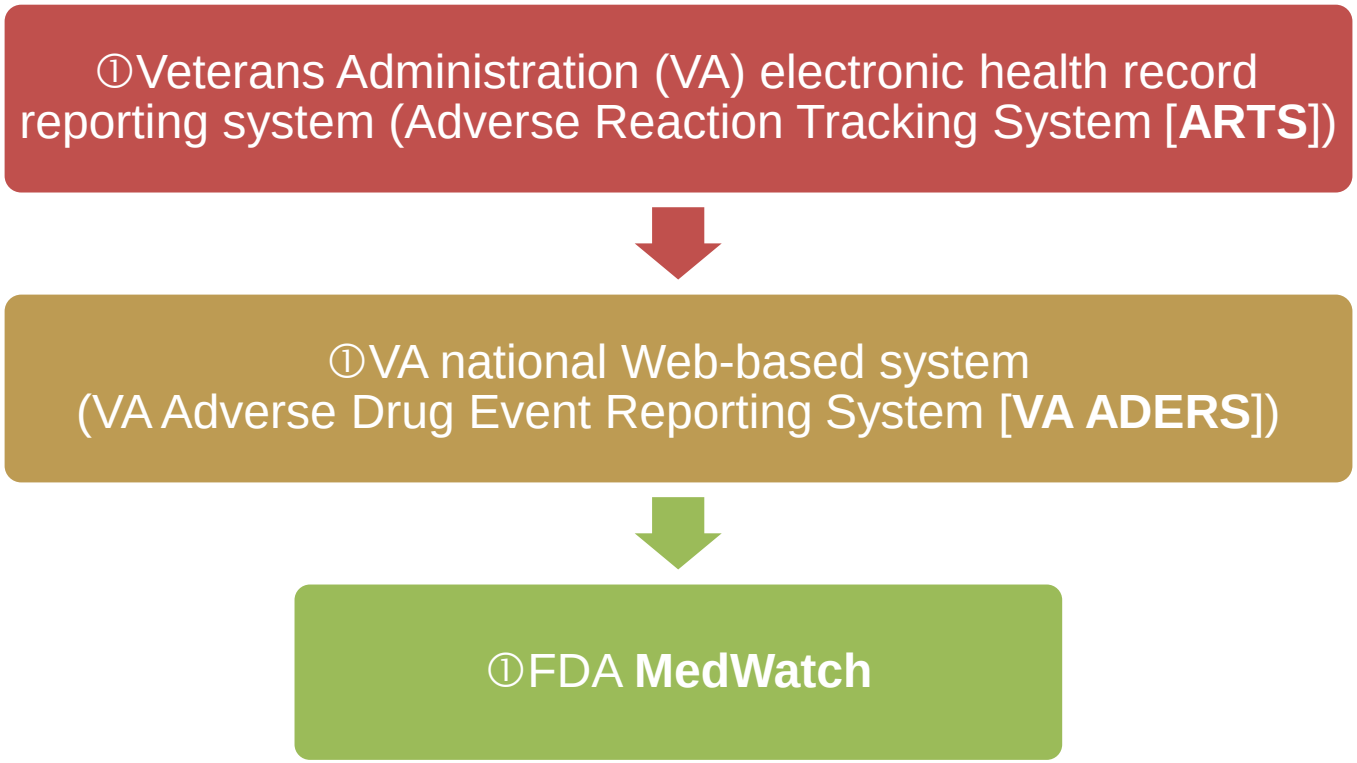
- Design: Retrospective cohort study (Eliquis) (Jardiance)
- N=2973. Outpatients who discontinued apixaban (2012) or empagliflozin (2014) within 3 years of FDA approval.
- Discontinuation defined: no refills of the medication within the period of the release date plus the days supply plus 90 days.

Identify subsets of patients with ICD codes possibly associated with an ADE.

Stratified random samples of charts.

If patients discontinued the medication due to an ADE.

- ADE (adverse drug event): medication error, adverse drug reaction (ADR), therapeutic failure of the medication, an adverse drug withdrawal event, or an overdose.



Why selected apixaban and empagliflozin?

- Relatively high use within the VHA shortly after FDA approval.
- Agents were new to the market at the time, and thus, their adverse effects should have been reported to FDA per a VHA Directive on Adverse Drug Event Reporting and Monitoring

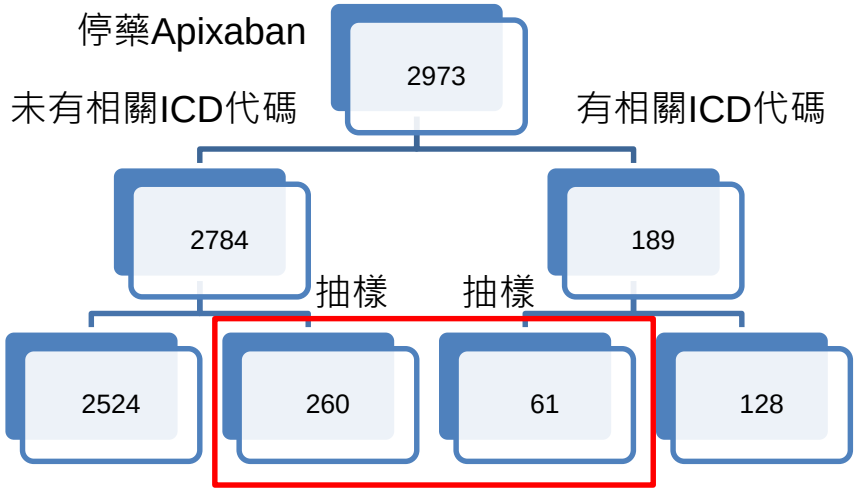


Table 2. Spontaneous Reporting of ADEs Identified During Chart Review[a]

Spontaneous Reporting System	No. (%) of Patients for Whom ADE Was Reported (95% CI, %)			
	Apixaban 21.5%		Empagliflozin 42.7%	
	Overall Random Sample[b] (*n* = 88 ADEs)	Extrapolated to Total Sample (*n* = 638 ADEs)[d]	Overall Random Sample[b] (*n* = 78 ADEs)	Extrapolated to Total Sample (*n* = 663 ADEs)[c]
ADE reported in ARTS package	16 (18.2) (10, 26.4)	116 (64, 168)[d]	22 (28.2) (18, 38.4)	187 (119, 255)
ADE reported in VA ADERS	9 (10.2) (3.8, 16.7)	65 (24, 107)	15 (19.2) (10.3, 28.2)	127 (68, 187)
ADE reported to FDA MedWatch	6 (6.8) (1.4, 12.2)	43 (9, 78)	6 (7.7) (1.6, 13.7)	51 (11, 91)
Any escalation (to ARTS, VA ADERS, or MedWatch)	20 (22.7) (13.8, 31.7)	145 (88, 202)	22 (28.2) (18, 38.4)	187 (119, 255)

Apixaban

Table 3. Apixaban ADEs and Their Seriousness from Chart Review[a]

Variable	No. (%) of Patients in Overall Random Sample (*n* = 88)
ADE seriousness	
Mild	37 (42.0)
Moderate	10 (11.4)
Severe	41 (46.6)
Preferred term name[b]	
Gastrointestinal hemorrhage	28 (31.8)
Feces discolored	16 (18.2)
Dizziness	13 (14.8)
Hematochezia	13 (14.8)
Anemia	12 (13.6)
Hemoglobin/hematocrit decreased	12 (13.6)
Melena	9 (10.2)
Asthenia	7 (8.0)
Rectal hemorrhage	7 (8.0)
Epistaxis	6 (6.8)
Hematuria	6 (6.8)
Contusion	5 (5.7)
Intracranial hemorrhage	5 (5.7)
Rash	5 (5.7)

- ADEs identified from patients with **ICD codes** of interest were more likely to be severe than ADEs from patients who were not identified using ICD codes (**75%** vs 22.9%, respectively).
- ADEs reported:

	Mild	**Severe**
ARTS	35%	7.3%
VA ADERS	13.5%	9.8%
FDA MedWatch	5.4%	9.8%

Empagliflozin

Table 4. Empagliflozin ADEs and Their Seriousness from Chart Review[a]

Variable	No. (%) of Patients in Overall Random Sample (*n* = 78)
ADE seriousness	
Mild	51 (65.4)
Moderate	19 (24.4)
Severe	8 (10.3)
Preferred term name[b]	
Treatment failure	16 (20.5)
Renal impairment	15 (19.2)
Polyuria	11 (14.1)
Hypotension	6 (7.7)
Genital candidiasis	5 (6.4)
Diarrhea	4 (5.1)
Dizziness	4 (5.1)
Urinary incontinence	4 (5.1)
Urinary tract infection	4 (5.1)
Dry mouth	3 (3.8)
Dehydration	3 (3.8)
Diabetic ketoacidosis	1 (1.3)
Other[c]	24 (30.8)

- ADEs from patients with ICD codes for ketoacidosis and/or amputation were more likely to be severe than ADEs from patients who were not identified using ICD codes (21.1% vs 6.8%, respectively).

- ADEs reported:

	Mild	**Moderate**	**Severe**
ARTS	23.5%	36.8%	37.5%
VA ADERS	11.8%	31.6%	37.5%
FDA MedWatch	3.9%	15.8%	12.5%

Factors associated with underreporting:

1) Well-known ADR
2) Trivial ADR
3) Causality uncertain
4) Ignorance
5) Diffidence (lack of self-confidence in ability to identify ADR accurately)
6) Lethargy (lack of interest/time)
7) Indifference (“one report will not make a difference”)
8) Being unaware of how or the need to report
9) Provider specialty
10) Lack of training/policies
11) Being unaware of what to report
12) A belief that only safe drugs come to market

- Providers may think that ADEs entered in ARTS are automatically entered into VA ADERS and that those in VA ADERS are automatically submitted to FDA MedWatch.

Limitations

- Only looked at ADEs associated with the discontinuation.
- Only about 11% of the cohort had their charts reviewed.

How to better encourage spontaneous reporting of ADEs?

- Active surveillance strategy.
- Specific ICD codes could be used in conjunction with the discontinuation of a medication.
- Link medication discontinuations with ADE reporting systems.

Am J Health-Syst Pharm. 2020; 77:47-51

Pharmacists' prescribing authority: The Oregon approach

Building blocks of prescribing authority

2015 [SB 520]	Permits pharmacists to administer vaccines to individuals at least 7 years of age.
2015 [HB 2879]	It authorizes pharmacists to prescribe and dispense hormonal contraceptive patches and self-administered oral hormonal contraceptives following a specific set of legislative criteria.
2016 [HB 4124]	Authorizes pharmacists under certain circumstances to autonomously prescribe and dispense unit-of-use naloxone to a person.
2017 [HB 2527]	The prescribing and administering of injectable hormonal contraceptives.

Proactive teamwork

- The coalition of **OSHP** and **OSPA** (together called the **Oregon Pharmacy Coalition**) has been successful in proposing and advocating legislation that allows independent prescribing authority for pharmacists.
- The coalition intends to continue to work with legislators by providing contributions from the pharmacy profession to implementing solutions to any other medication use–related issues that face the State of Oregon and healthcare providers in the future.

Securing multidisciplinary support

- **PHPFAC** and expanded the committee to 7 multidisciplinary members: 2 physicians; 2 nurses; and 3 pharmacists.
- **PHPFAC** has statutory authority to make recommendations to **OBOP** for rule adoption of protocols for drug therapy management.

- OSHP: Oregon Society of Health-System Pharmacists
- OSPA: Oregon State Pharmacy Association
- PHPFAC: Public Health and Pharmacist Formulary Advisory Committee
- OBOP: Oregon Board of Pharmacy

OSHP Home
OREGON SOCIETY OF HEALTH-SYSTEM PHARMACISTS

OSPA
OREGON STATE PHARMACY ASSOCIATION

Initial formulary drugs and devices

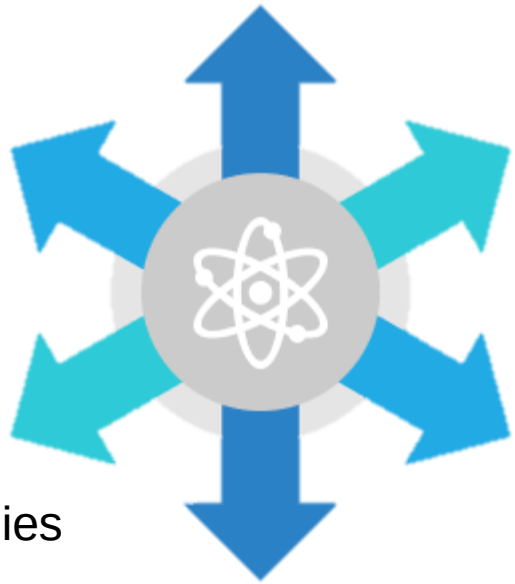
- **PHPFAC** has expanded pharmacists' autonomous authority to prescribe several other drugs and devices.
- The committee approved drugs and devices for addition to the postdiagnostic formulary and new protocols for the first time in February 2018 such as:

Epinephrine autoinjectors

Albuterol inhalers

Emergency refills of insulin

Diabetic testing supplies



Smoking cessation aids

Discharge medications for transitions of care

Rapid strep tests

Spacers

- PHPFAC: Public Health and Pharmacist Formulary Advisory Committee

Prospects for future advances

- Oregon pharmacists' authority to prescribe is **postdiagnostic** in nature and regulated by **OBOP**.
- Practicing pharmacists can propose formulary and protocol concepts for review by a multidisciplinary advisory board consisting of physicians, advanced practice nurses, and pharmacists that makes eventual recommendation to **OBOP** for appropriate rule making.
- Areas for future research should assess the rates of pharmacist prescribing, payment for prescribing services, and comparisons of models of autonomous pharmacist authority for the writing of prescriptions developed and implemented in other states and Canadian provinces.

Am J Health-Syst Pharm. 2020; 77:52-55

COMMENTARY

Current practices for identifying and managing challenging pharmacy residents: A needs assessment

Challenging trainee: "Who is performing below preceptor expectations with regard to knowledge, attitude, or skill set."

- The prevalence of challenging physician trainees is estimated at 7%-28%, but the prevalence in pharmacy residency trainees is unknown.

- A national survey of pharmacy residency preceptors found that more than 90% of preceptors felt confident in providing effective feedback, whereas only 57% of residents believed they received effective written and oral feedback.

A need for more research on challenging trainees

Table 1. Demographics of Respondents to Needs Assessment (n = 225)[a]

Variable	Value
Primary position, no. (%)	
Preceptor	134 (60)
RPD	91 (40)
Median duration precepting experience, yr (IQR)	
Preceptor	5 (2–11)
RPD	8 (4.5–11.5)
Type(s) of residency program, no. (%)[b]	
PGY1	213 (95)
PGY2	74 (33)
PGY1/PGY2	39 (17)
Median annual no. residents in program (IQR)	
PGY1	3 (2–5)
PGY2	2 (1–4)
Practice setting, no. (%)	
Community-based teaching hospital	125 (55)
University-based hospital	51 (23)
VA/military	11 (5)
Primary care office	10 (4)
Community pharmacy	4 (2)
Managed care organization	4 (2)
Academia	3 (1)
Other[c]	17(8)

- RPD = residency program director

- 36-question:

1) Baseline demographics of survey respondents
2) Definition of a challenging resident
3) Apparent and underlying causes
4) Remediation strategies
5) Screening for potential challenging residents
6) Requirements for graduation
7) Resident termination

- 225 responses were received.

Observations

Table 2. Most Common Trainee Deficiencies Among Challenging Residents and Underlying Causes as Reported by Respondents

Factor	No. Responses[a]	
Trainee deficiency		
Inefficient use of time	124	(55%)
Insufficient clinical knowledge	97	
Unsatisfactory clinical skills	96	
Poor clinical judgment	75	
Inappropriate interactions with colleagues/staff	71	
Excessive and unexplained tardiness or absences	49	
Underlying causes of deficiency		
Situational, personal, professional stresses	111	(49%)
Lack of communication with preceptors	109	
Resistant to incorporating feedback	90	
Missing deadlines	88	
Resistant to receiving feedback	88	
Burnout	48	

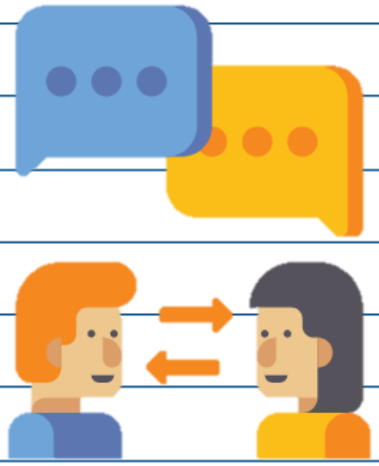
[a]More than one response could be selected.

Remediation Strategies

Table 3. Remediation Strategies for Challenging Resident Trainees Reported by Residency Program Directors and Preceptors

Strategy	No. Responses[a]
More frequent feedback sessions	135
Extended rotation	59
Assigned mentor for structured supervision	52
Additional outside work	47
Repeat rotation	45
Strict behavioral guidelines	37
Remedial didactic curriculum	35
Probation	24
Psychiatric/psychological counseling	11
Formal psychomotor function testing/learning assessment	4

[a]More than one response could be selected



(60%)

Remediation Strategies

- Most respondents indicated either a consistent (61%) or increasing (28%) number of challenging residents over the past 5 years.
- Approximately 1/3 of respondents reported that remediation corrected the issue (always or usually), whereas in almost 2/3 remediation only sometimes or seldom corrected the issue.

Future research

- Determine best practices and effectiveness of early identification strategies for struggling residents and remediation processes.
- Our needs assessment did not evaluate the trainee's self-assessment skills, but this could be an additional focus area.

Am J Health-Syst Pharm. 2020; 77:33-38

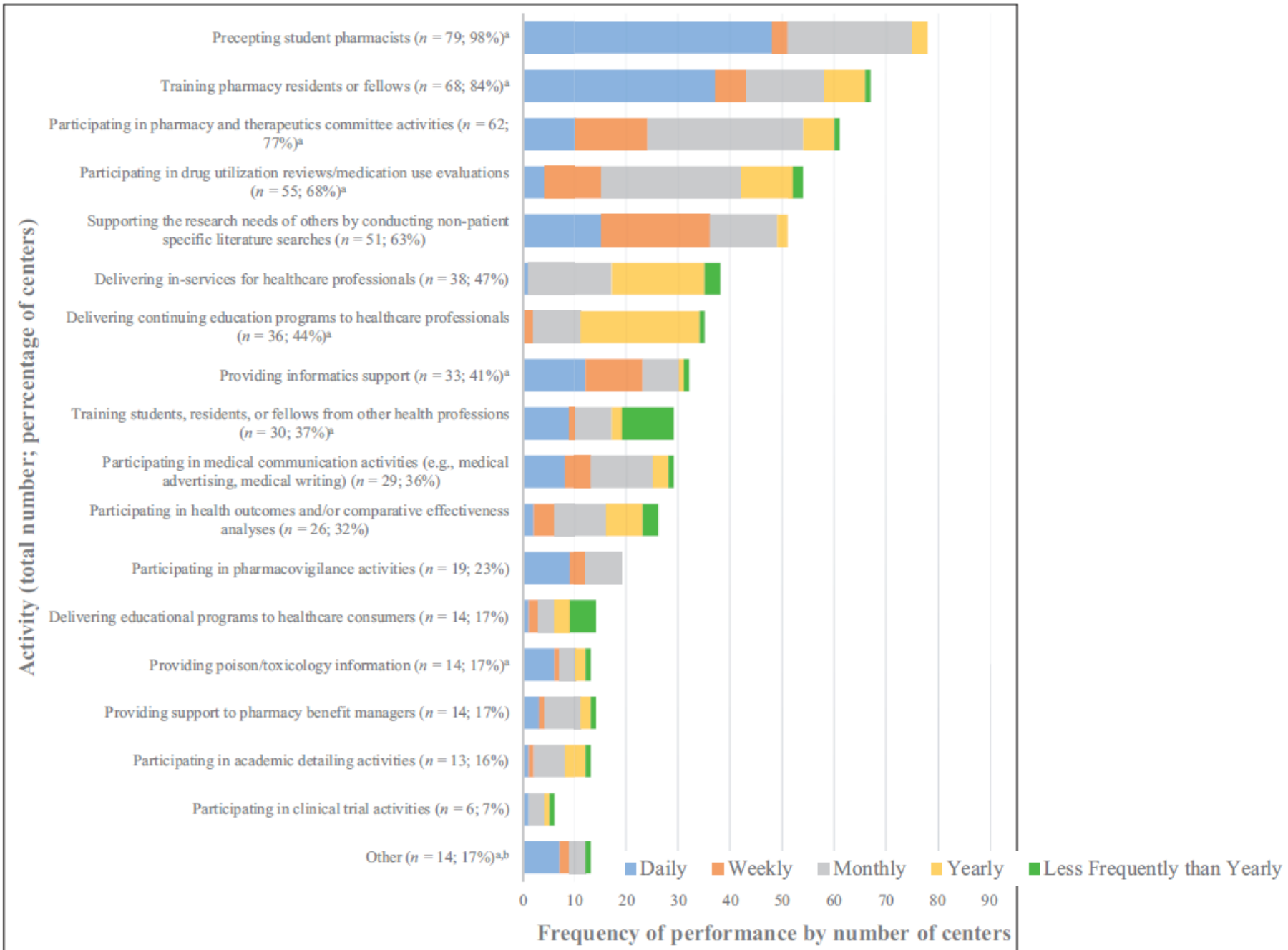
Survey of drug information centers in the United States—2018

- **DICs (Drug information centers)**, defined as formal centers dedicated to providing drug information services, including but not limited to responding to drug information requests.

- In 1962, the University of Kentucky founded the first formal DIC.
- The principal goal of the center was for pharmacists to support, assist, and promote appropriate patient-specific pharmacotherapy by educating and influencing prescribers.

- An electronic question survey was delivered. They were asked questions about their characteristics, activities and services, drug information requests, and networking activities.
- The response rate was 79% (93 of 118 DICs).
- Of the 93 respondents, 82 (88%) met the definition of a DIC and were included in the directory.
  - ✓ 37 (45%) belonged to a university or college
  - ✓ 36 (44%) belonged to a medical center or hospital
  - ✓ 70% of the DICs (*n* = 57) had been in existence for more than 20 years.

Activities and services



DI requests

Requests were reported to be accepted from:

1) Healthcare professionals (*n* = 80, 100%)
2) Healthcare consumers (*n* = 33, 41%)
3) Attorneys (*n* = 1, 1%),
4) Social workers (*n* = 1, 1%),
5) Law enforcement (*n* = 1, 1%)
6) Government agencies (*n* = 1, 1%)

The average numbers of monthly requests:

- < 50 requests (*n* = 52, 65%)
- 51 - 100 (*n* = 12, 15%)
- 101 - 150 (*n* = 9, 11%)
- 151 - 200 (*n* = 2, 3%)
- > 200 (*n* = 5, 6%)

- Perhaps DICs are content with the number of DI requests that they currently handle, as this may be conducive to engagement in other activities.

- Despite the variety of services already offered, many DICs (54%) were making efforts to expand their services.
- e.g., attempts to increase the number of DI requests, expand the types of activities offered, or expand the client base.

- Mobile APP: 3 DICs (4%) used a mobile application to receive DI requests.

Networking

- Participants were asked to identify the most appropriate national meeting for holding a networking session among the DI community.
- The 3 most commonly reported venues were ASHP, ACCP, and AACP national meetings.
- Other reported tools included directories of email addresses (*n* = 16, 33%), Facebook (*n* = 5, 10%), Twitter (*n* = 4, 8%), and LinkedIn (*n* = 4, 8%).

Limitations

- It is possible that some DICs were not included in the mailing list used to distribute the survey instrument.
- DICs that meet the stated criteria but are not listed in the directory are urged to contact the investigators so that the directory can be updated accordingly.

Conclusion

- The survey identified 82 DICs that collectively provide a variety of services to their clienteles.
- The DIC directory should facilitate networking among DICs.

Am J Health-Syst Pharm. 2020; 77:138-147

PRACTICE RESEARCH REPORT

A systematic overview of systematic reviews evaluating medication adherence interventions

- From MEDLINE, Cochrane (2004-2017); English language systematic reviews (SRs).

➢ **Interventions**, defined as strategies aimed at improving accordance with the prescribed interval and dose of a dosing regimen.

Inclusion

➢ Adult patients prescribed medication for 1 of the following disease conditions:

1. Diabetes and prediabetes
2. Cardiac conditions
3. Hypertension and prehypertension
4. Stroke
5. Cognitive impairment

➢ Non–disease-specific SRs that considered medication adherence interventions for older adults, adults with chronic illness, and adults with known medication adherence problems.

Evaluation of quality

- Assessed the methodological quality of each relevant SR using the validated **A MeaSurement Tool to Assess systematic Reviews (AMSTAR)** instrument.

A	1. Was an 'a priori' design provided? 是否有事前設計方案或計畫書？	Yes No/Can't answer Not applicable
	2. Was there duplicate study selection and data extraction? 研究選取和數據擷錄的步驟，是否不只由一人重複進行？	Yes No/Can't answer Not applicable
	3. Was a comprehensive literature search performed? 文獻搜尋是否足夠廣泛？	Yes No/Can't answer Not applicable
M	4. Was the status of publication (i.e. grey literature) used as an inclusion criterion? 出版狀態是否為納入標準？	Yes No/Can't answer Not applicable
S	5. Was a list of studies (included and excluded) provided? 是否提供文獻篩選流程圖及納入與排除的文獻/研究清單？	Yes No/Can't answer Not applicable
	6. Were the characteristics of the included studies provided? 是否提供納入研究的特徵？	Yes No/Can't answer Not applicable
T	7. Was the scientific quality of the included studies assessed and documented? 是否已評估所納入研究的品質，並加以記錄？	Yes No/Can't answer Not applicable
A	8. Was the scientific quality of the included studies used appropriately in formulating conclusions? 納入研究的品質，是否與研究結論的推導有適當的呼應？	Yes No/Can't answer Not applicable
	9. Were the methods used to combine the findings of studies appropriate? 用於統合各研究數據的方法是否適當？	Yes No/Can't answer Not applicable
R	10. Was the likelihood of publication bias assessed? 是否有評估文獻發表偏差的可能性？	Yes No/Can't answer Not applicable
	11. Was the conflict of interest stated? 是否說明利益衝突？	Yes No/Can't answer Not applicable

- The tool contains 11 requisite items.
- Each SR may receive a score ranging from 0-11.
- AMSTAR score of 8 or greater, which is an accepted cutoff used in prior work.

Articles included in overview (AMSTAR ≥8) (n=25)

Quality of evidence

- **GRADE (Grades of Recommendation, Assessment, Development and Evaluation).**
- GRADE domains: study design, study quality, consistency, directness, and other modifying factors, including precision and strength of effect estimates.

Table 1. GRADE certainty ratings

	Certainty	What it means
	Very low	The true effect is probably markedly different from the estimated effect
★	Low	The true effect might be markedly different from the estimated effect
★★	Moderate	The authors believe that the true effect is probably close to the estimated effect
	High	The authors have a lot of confidence that the true effect is similar to the estimated effect

Table 2. Reasons rate certainty in evidence up or down

Certainty can be rated down for:	Certainty can be rated up for:
• Risk of bias • Imprecision • Inconsistency • Indirectness • Publication bias	• Large magnitude of effect • Dose-response gradient • All residual confounding would decrease magnitude of effect (in situations with an effect)

Study characteristics

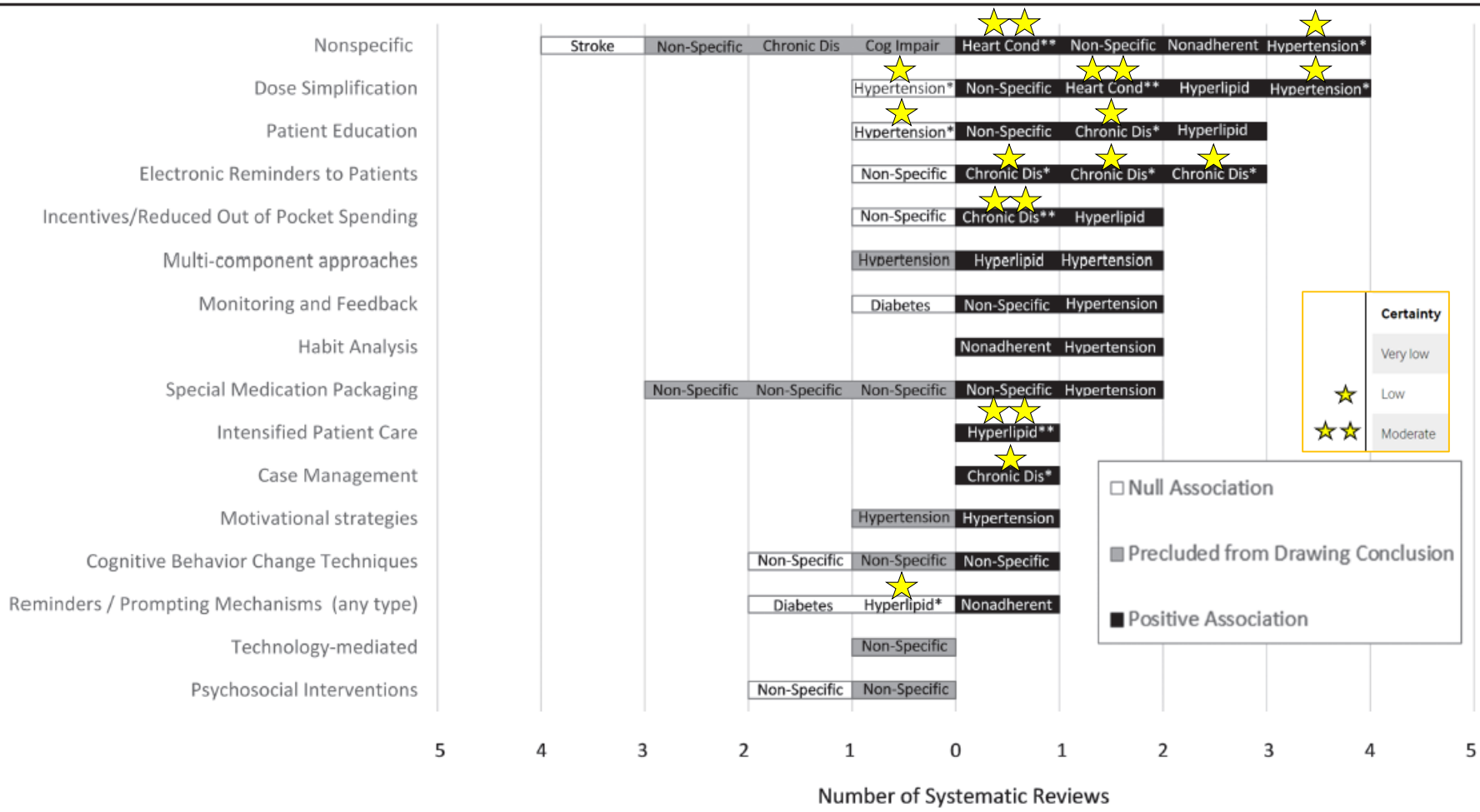
Patient types included:

1) Non–disease-specific patients (60%)
2) cardiovascular disease (8%)
3) Hypertension or prehypertension (8%)
4) Taking statins (4%)
5) Diabetes or prediabetes (4%)
6) Poststroke patients (4%)
7) Hyperlipidemia (4%)
8) Cognitively impaired older adults (4%)
9) Experiencing medication adherence problems (4%)

The types of interventions on which SRs focused were varied and included:

1) Nonrestricted intervention types (48%)
2) Special medication packaging (16%)
3) Dose simplification (8%)
4) Electronic reminders (8%)
5) Cognitive behavior change techniques (4%)
6) Text messaging reminders (4%)
7) Monitoring and messaging interventions (4%)
8) Psychosocial or educational interventions (4%)
9) Technology focused interventions (4%)

Figure 2. Conclusions of systematic reviews that examined effectiveness of intervention components on medication adherence.



Key: No asterisk = Very low quality of evidence using GRADE; * = Low quality of evidence using GRADE; ** = Moderate quality of evidence using GRADE; Chronic Dis = Chronic disease; Cog Impair = Cognitive Impairment; Heart Cond = Heart conditions; Hyperlipid = Hyperlipidemia; Nonadherent = Adherence problems

Conclusion. Despite an abundance of primary studies and despite only examining high-quality SRs, the vast majority of primary studies supporting SR authors' conclusions were of low or very low quality. Nonetheless, health system leaders seeking to improve medication adherence should prioritize interventions that have been studied and found to be effective at improving patient adherence, including dose simplification, education, reminders, and financial incentives.

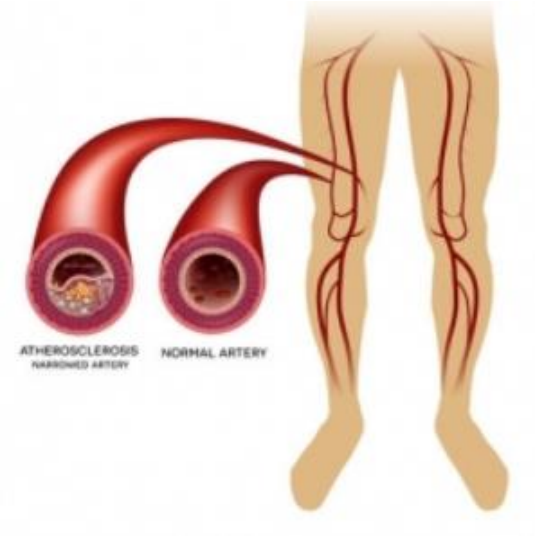
- Encourage investigators to focus future research on these most promising areas, prioritizing rigorous methodology.

Am J Health-Syst Pharm. 2020; 77:269-276

Antithrombotic therapy for postinterventional management of peripheral arterial disease

PAD (peripheral arterial disease): intermittent claudication, critical limb ischemia, and acute limb ischemia.

Vascular interventions and their role in the management of PAD



- **Antithrombotic pharmacotherapy** may be intensified in the **postrevascularization** period.
- Unlike in the case of stable PAD or acute coronary artery disease, there is little consensus on the optimal antithrombotic regimen for patients with PAD post revascularization.
- Optimal medical therapy with a **statin and an antiplatelet**, already known to reduce MACE events in patients with stable PAD, has also been associated with better outcomes post revascularization.

MACE: major adverse cardiac events

Literature review of antithrombotic therapy following revascularization of lower extremities

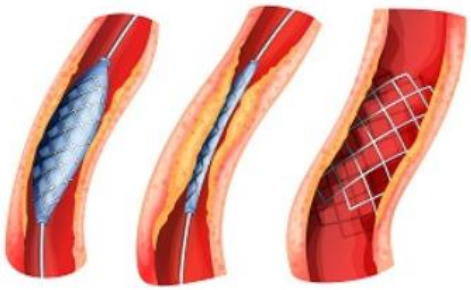
◆ Endovascular interventions

➢ **Single antiplatelet therapy (SAPT)**

- No benefit of high-dose aspirin over that provided by low-dose aspirin in preventing 6-month primary occlusion.
- The preference to use **aspirin 81 mg/day** rather than aspirin 325 mg/day after an endovascular revascularization.

➢ **Dual antiplatelet therapy (DAPT)**

- While the MIRROR study demonstrated some benefit of DAPT, based on its findings the combination of **aspirin and clopidogrel** cannot be recommended for routine use in patients undergoing endovascular interventions, as the trial enrolled a very small number of patients and the rate of bleeding events was not reported.



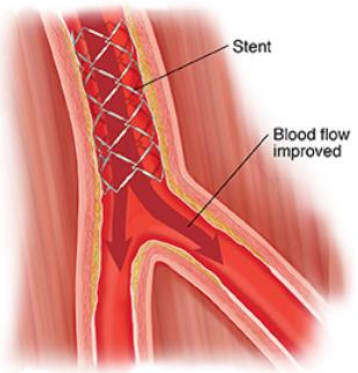
◆ Endovascular interventions (continued)

➢ **Anticoagulation therapy**

- **Vitamin K antagonist** (VKA) or DAPT [**aspirin + dipyridamole** or **aspirin + clopidogrel**]
- These findings are difficult to apply to clinical practice, as an INR goal was not reported in any of the individual trials.

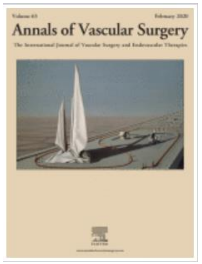
➢ **Combination of anticoagulation and antiplatelet therapy**

- ePAD trial: **edoxaban** 60 mg/day **+ aspirin** 100 mg/day compared with **clopidogrel** 75 mg/day **+ aspirin** 100 mg/day.
- The trial is precluded by its proof-of-concept design, limited sample size (n = 201), and use of a control (DAPT) that does not represent a standard of care.



Cilostazol

Cilostazol Reduces Angiographic Restenosis After Endovascular Therapy for Femoropopliteal Lesions in the Sufficient Treatment of Peripheral Intervention by Cilostazol Study Circulation. 2013 Jun 11;127(23):2307-15.



Efficacy of *C*ilost*A*zol for *B*elow-the-Knee Artery Disease after *B*alloon *An*G*i*oplasty in Pati*E*nts with Severe Limb Ischemia (CABBAGE Trial)

Ann Vasc Surg. 2017 Nov;45:22-28.

- Findings from these trials support the use of **cilostazol (200mg/day) + SAPT (Aspirin 100mg/day)** to reduce the rates of restenosis after **low-risk** endovascular interventions, especially when a **bare-metal stent** is retained.
- In contrast, patients with **high-risk balloon revascularization** do not seem to benefit from treatment with cilostazol.
- The overall **risk of bleeding** does not seem to be increased by addition of cilostazol to SAPT. Candidates for therapy with cilostazol should be selected carefully due to the drug's **potential to exacerbate cardiac conditions** such as arrhythmias and heart failure.

◆ Surgical interventions

➢ **Single antiplatelet therapy**

- No trials of SAPT relevant to the scope of this review were identified.

➢ **Dual antiplatelet therapy**

- The combination of **DAPT** (clopidogrel 75 mg/day and aspirin 75-100 mg/day) compared with **SAPT** (aspirin 75-100 mg/day) did not improve limb or systemic outcomes in the overall population of PAD patients requiring below-knee bypass grafting.
- Subgroup analysis suggests that **clopidogrel + aspirin** confers benefit in patients receiving **prosthetic grafts** without significantly increasing major bleeding risk.

Results of the randomized, placebo-controlled clopidogrel and acetylsalicylic acid in bypass surgery for peripheral arterial disease (CASPAR) trial

J Vasc Surg. 2010 Oct;52(4):825-33, 833.e1-2.

◆ Surgical interventions (continued)

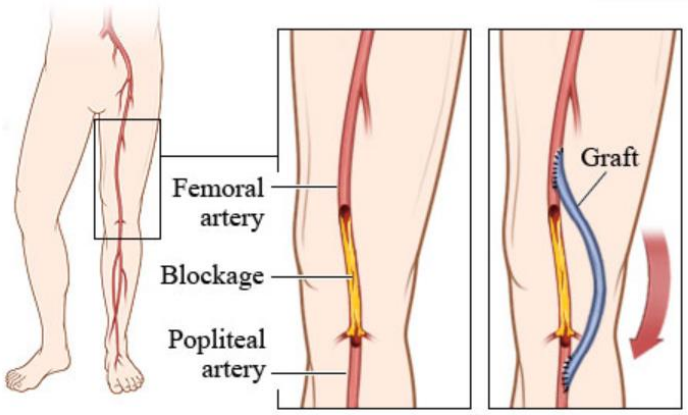
➢ Anticoagulation therapy

THE LANCET

Efficacy of oral anticoagulants compared with aspirin after infrainguinal bypass surgery (The Dutch Bypass Oral anticoagulants or Aspirin study): a randomised trial

Lancet. 2000 Jan 29;355(9201):346-51.

- **Vitamin K antagonist** (INR 3.0-4.5) was better for the prevention of **infrainguinal-vein-graft** occlusion and for lowering the rate of ischaemic events.
- **Aspirin** was better for the prevention of **non-venous graft** occlusion, and was associated with fewer bleeding episodes.



◆ Surgical interventions (continued)

➢ **Combination of anticoagulation and antiplatelet therapy**

- Patients with a lower extremity arterial bypass, chronic **aspirin** administration remains the mainstay of antithrombotic therapy.
- Low dosage **warfarin** therapy may provide some additional patency benefit for patients with **a femoral-popliteal prosthetic bypass** and for patients with a **vein bypass that is at high risk for thrombosis**.
- The addition of warfarin therapy does significantly increase the risk of hemorrhagic events.

Benefits, morbidity, and mortality associated with long-term administration of oral anticoagulant therapy to patients with peripheral arterial bypass procedures: A prospective randomized study

J Vasc Surg. 2002 Mar;35(3):413-21.

➢ **Cilostazol**

- No relevant trials on the efficacy of cilostazol in patients undergoing bypass grafting were identified.

Guideline recommendations for antithrombotic therapy following revascularization of lower extremities

Table 2. Guideline Recommendations on Pharmacotherapy After Peripheral Revascularization[a]

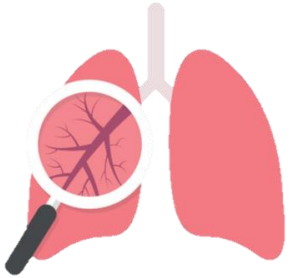
Guideline or Organization (Yr Published)	Recommendation	Recommendation Class
TASC II (2007)[9]	Antiplatelet therapy started preoperatively and continued after an endovascular or surgical procedure; unless contraindicated, should be continued indefinitely	A (high-quality evidence)
ACCP (2012)[45] ★★★	Long-term aspirin (75–100 mg/day) or clopidogrel (75 mg/day) after percutaneous angioplasty with or without stenting	1A (strong recommendation, high-quality evidence)
	SAPT preferred over DAPT for patients undergoing percutaneous angioplasty with stenting	2C (moderate recommendation, low-quality evidence)
★★★	Aspirin 75–100 mg/day or clopidogrel 75 mg/day continued long term in most patients following peripheral artery bypass graft surgery; preferred over no antithrombotic treatment	1A (strong recommendation, high-quality evidence)
	SAPT preferred over DAPT and warfarin	1B (strong recommendation, moderate-quality evidence)
	Clopidogrel 75 mg/day plus aspirin 75–100 mg/day preferred over aspirin alone for 1 yr in patients undergoing below-knee bypass graft surgery with prosthetic graft	2C (moderate recommendation, low-quality evidence)
	SAPT preferred over DAPT for all other patients undergoing peripheral artery bypass surgery	2B (moderate recommendation, moderate-quality evidence)
ACC/AHA (2016)[4]	DAPT (aspirin and clopidogrel) to reduce the risk of limb-related events in patients with symptomatic PAD after lower extremity revascularization	IIbC (weak recommendation, low-quality evidence)
	The usefulness of anticoagulation to improve patency after lower extremity autogenous vein or prosthetic bypass is uncertain	IIbB (weak recommendation, moderate-quality evidence)
ESC (2017)[5] ★★★	SAPT after infrainguinal bypass surgery	IA (strong recommendation, high-quality evidence)
	Vitamin K antagonists after autologous vein infrainguinal bypass	IIbB (weak recommendation, moderate quality evidence)
	DAPT with aspirin and clopidogrel for at least 1 mo after infrainguinal stent implantation	IIaC (moderate recommendation, low-quality evidence)
	DAPT with aspirin and clopidogrel in below-knee bypass with prosthetic graft	IIbB (weak recommendation, moderate-quality evidence)

[a]TASC = Trans-Atlantic Inter-Society Consensus, ACCP = American College of Chest Physicians, SAPT = single antiplatelet therapy, DAPT = dual antiplatelet therapy, ACC = American College of Cardiology, AHA = American Heart Association, PAD = peripheral arterial disease

- Reflecting the overall lack of high-quality evidence, none of the guidelines gives a strong recommendation for the use of any antithrombotic regimen beyond the backbone of SAPT.

Am J Health-Syst Pharm. 2020; 77:259-268

Management of chronic obstructive pulmonary disease: A review focusing on exacerbations



1. Impact of exacerbations on patients:

a) **Exacerbations** are a major contributor to disease progression, with accelerated lung-function decline in patients who experience exacerbations, and the greatest decline seen in patients with mild disease.
b) **Severe exacerbations** are also associated with a significant increase in mortality, making **prevention of exacerbations** the key goal in management of COPD.
c) **GOLD** recommendations place a major focus on the role of exacerbations in determining treatment options with the updated **ABCD disease risk stratification tool**.

GOLD: Global Initiative for Chronic Obstructive Lung Disease

2. Management of COPD

2019 Global Initiative for Chronic Obstructive Lung Disease

THE REFINED ABCD ASSESSMENT TOOL

Spirometrically confirmed diagnosis → Assessment of airflow limitation → Assessment of symptoms/risk of exacerbations

Post-bronchodilator $FEV_1/FVC < 0.7$

Grade	FEV_1 (% predicted)
GOLD 1	≥ 80
GOLD 2	50-79
GOLD 3	30-49
GOLD 4	< 30

Moderate or Severe Exacerbation History

- ≥ 2 or ≥ 1 leading to hospital admission
- 0 or 1 (not leading to hospital admission)

C	D
A	B

mMRC 0-1 CAT < 10 | mMRC ≥ 2 CAT ≥ 10

Symptoms

A INITIAL PHARMACOLOGICAL TREATMENT

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization	**Group C** LAMA	**Group D** LAMA or LAMA + LABA* or ICS + LABA**
0 or 1 moderate exacerbations (not leading to hospital admission)	**Group A** A Bronchodilator	**Group B** A Long Acting Bronchodilator (LABA or LAMA)

*Consider if highly symptomatic (e.g. CAT > 20)
**Consider if eos ≥ 300

mMRC 0-1 CAT < 10 | mMRC ≥ 2 CAT ≥ 10

B FOLLOW-UP PHARMACOLOGICAL TREATMENT

1. **IF RESPONSE TO INITIAL TREATMENT IS APPROPRIATE, MAINTAIN IT.**
2. **IF NOT:**
   - ✓ Consider the predominant treatable trait to target (dyspnea or exacerbations)
     - Use exacerbation pathway if both exacerbations and dyspnea need to be targeted
   - ✓ Place patient in box corresponding to current treatment & follow indications
   - ✓ Assess response, adjust and review
   - ✓ These recommendations do not depend on the ABCD assessment at diagnosis

• DYSPNEA •

LABA or LAMA → LABA + LAMA (**) / LABA + ICS (**) → LABA+LAMA+ICS

- Consider switching inhaler device or molecules
- Investigate (and treat) other causes of dyspnea

• EXACERBATIONS •

LABA or LAMA → (*) LABA + LAMA (**) / LABA + ICS (**)

- Consider if eos < 100: LABA + LAMA
- Consider if eos ≥100: LABA + ICS
- LABA + LAMA + ICS

Roflumilast — FEV_1 < 50% & chronic bronchitis

In former smokers: Azithromycin

eos = blood eosinophil count (cells/µL)
** Consider if eos ≥ 300 or eos ≥ 100 AND ≥ 2 moderate exacerbations / 1 hospitalization*
*** Consider de-escalation of ICS or switch if pneumonia, inappropriate original indication or lack of response to ICS*

Opportunities for transitional care management


Poor inhaler technique


Poor satisfaction


Poor adherence

- Selection of an appropriate inhaler is also important.

- **Initial and repeated reinforcement** of patient education on inhaler technique is critical for COPD management.
- The use of **multiple inhalers** can be confusing to patients and lead to poor inhaler technique.

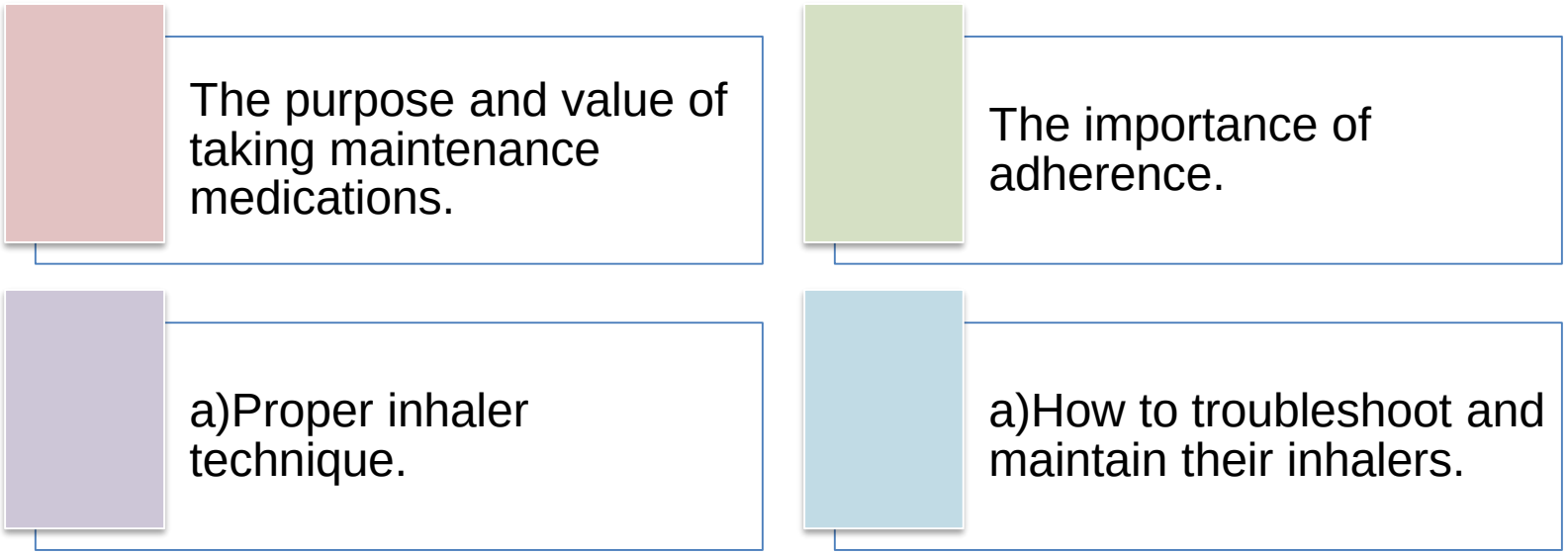

Increased mortality rates


Increased hospitalizations

- GOLD 2019 report, for the first time, highlights the importance of assessing inhaler technique and adherence in patients with poor symptom control before adjusting patients' medications/treatment regimen.

Opportunities for transitional care management (continued)

- Community, clinical, and hospital pharmacists can provide medication-related education for patients with COPD, including:



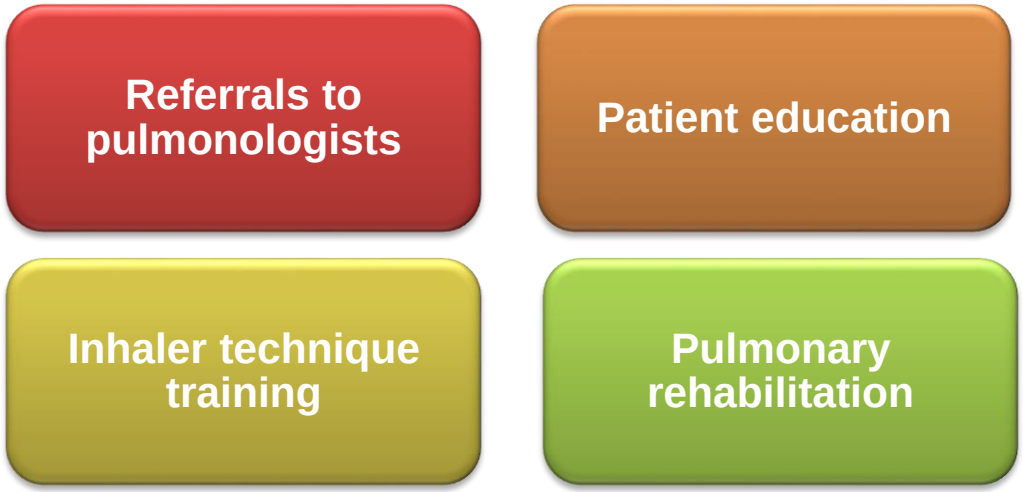
- A review of studies conducted during a 10-year period showed that inhaler training education and medication adherence by community pharmacists had a positive impact, resulting in significant **reduction in inhalation errors**, **improvement in the choice of inhalers**, and **better adherence** to inhaled medication.

3. Implications for the health system and managed care community

- Exacerbations of COPD are a major cause of healthcare resource use compared with stable COPD.
- Data from large prospective and retrospective studies suggest that 37-71% of patients with COPD experience at least 1 exacerbation annually. 9-31% require an ED visit and 14-35% require hospitalization.
- Mean cost of treatment for a severe exacerbation that requires hospitalization can range from $7,000 to $39,200, with costs substantially elevated for patients who require mechanical ventilation.
- Survival rates at 5 years after a hospitalization for a COPD exacerbation are estimated to be only 45%.

COPD exacerbations, particularly those that require ED visits or hospitalization, lead to substantial economic burden.

- Several studies have found that **COPD aftercare programs** that increase patient support are beneficial in improving outcomes and reducing hospitalizations:



- **A disease-management program for COPD** reduced COPD-related and all-cause 60- and 90-day readmission rates: **home visits, clinical assessment, medication review, inhaler technique training, and disease-education components.**

◆ This highlights that continuing the move toward integrated care of COPD is the way to achieve better outcomes.

Implementation of a medication education training program for student pharmacists employed within an academic medical center

- **Medication education** prior to discharge may improve transitions of care TOC.
- Some of the medication education encounters were not completed due to the limited provision of medication education on **weekends**.
- A clinical weekend shift for second- and third-year student pharmacists already employed was proposed, with completion of medication education designated as one of the major responsibilities of the shift.

REWARDS Method

1. **R**ead hand book
2. **E**lectronic learning
3. **W**orkshop
4. **A**ssessment and **R**eview of checklist
5. **D**irect observation
6. **S**ign-off

Student self-directed learning

Pharmacist-facilitated learning

High risk medication:

Immunosuppressants

Oral fluoroquinolones

Oral chemotherapy

Anticoagulants

Inhalers

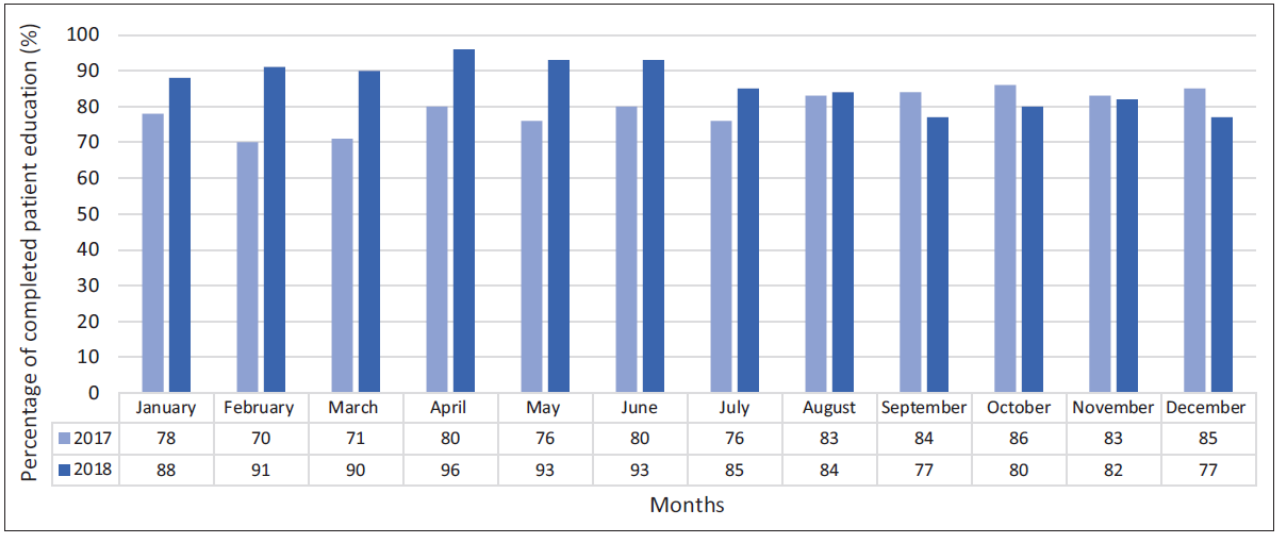
Insulin

Naloxone

Oral linezolid

Long-acting opioids

Figure 2. Percentage of completed patient education sessions in 2018 versus 2017.



	January	February	March	April	May	June	July	August	September	October	November	December
2017	78	70	71	80	76	80	76	83	84	86	83	85
2018	88	91	90	96	93	93	85	84	77	80	82	77

- The division's completion rate for patients requiring education was 79% in 2017, compared to 86% in 2018 (p = 0.006).

- An important measure of the success of the REWARDS Method would be to assess patient understanding and satisfaction with the education provided by the student pharmacists.
- It directly answers the 2009 ASHP policy position calling for increased student involvement in the provision of patient care.

➢ Observe no difference in success rates by college of pharmacy or year of pharmacy school. Indicate that the REWARDS Method is an effective training technique regardless of the students' background knowledge.

- 2 colleges of pharmacy
- 3 second-year students and 7 third-year students.

Am J Health-Syst Pharm. 2020;77:386-400

ASHP REPORT

ASHP long-range vision for the pharmacy workforce in hospitals and health systems

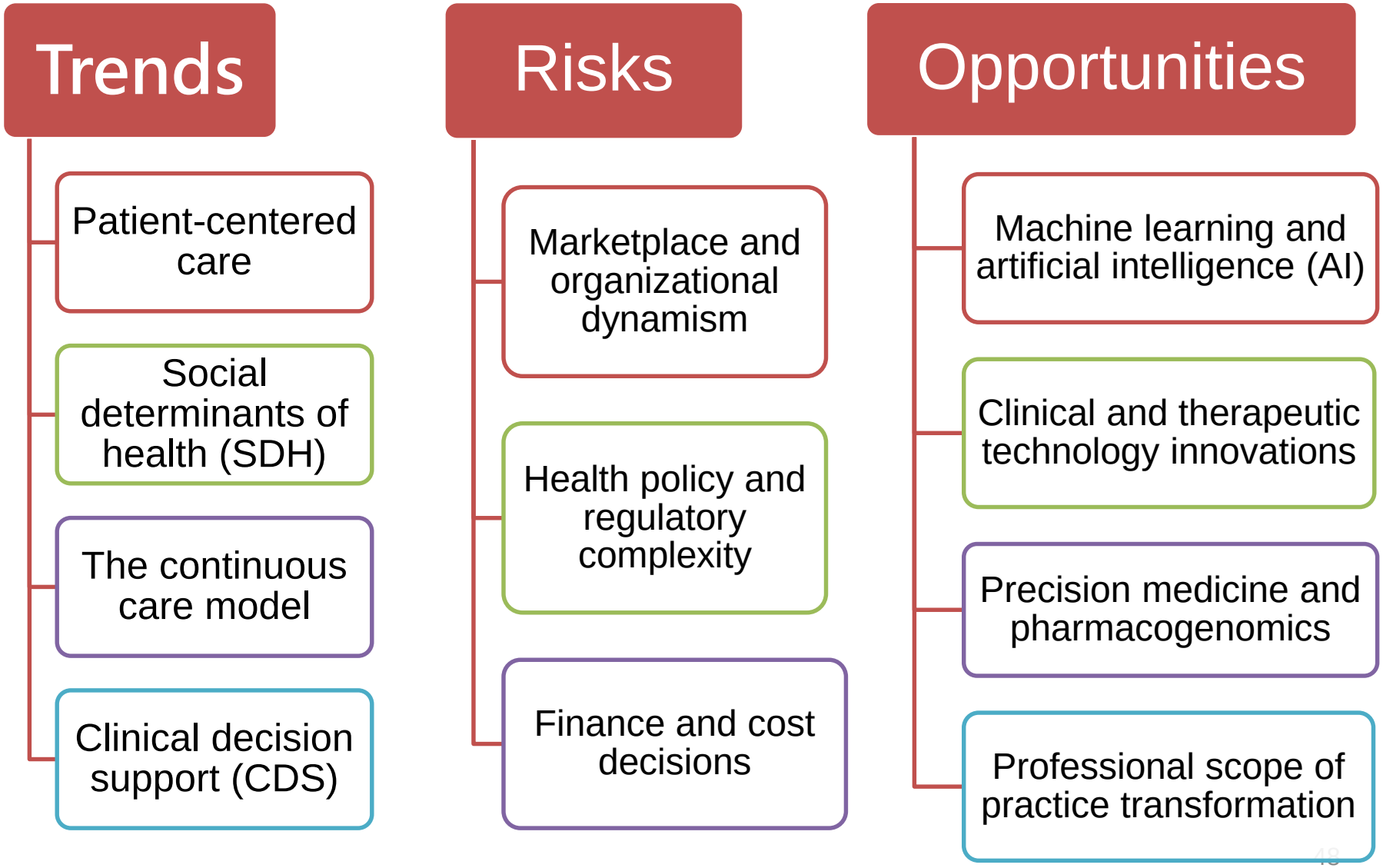
Ensuring medication use is optimal, safe, and effective in acute and ambulatory care settings

2030 outlook: medication-use experts accountable for
- Comprehensive medication management (CMM)
- Medication management services (MMS)

Vision for Pharmacists					
Pharmacy Education	Residency Training	Certifications	Credentialing & Privileging	Ongoing Professional Development	Leadership
• Pharmacy education will evolve to prepare graduates for future practice by individualized learning tracks, engagement in active learning models, dual degrees, and interprofessional activities. • Certificate programs will play an important role in providing focused education and training to pharmacists, student pharmacists, and pharmacy technicians to enhance and demonstrate specific skill sets.	• Residency training will evolve to include more education around leadership, resiliency, interprofessional care delivery, population health, technology and data expertise, and soft skills. • Residents will extend patient care and experiential education efforts in hospitals and health systems through the use of the layered learning practice model.	• Minimum credentials for new practitioners will expand to include board certification, specialized certificates or certifications, and PGY1 and/or PGY2 residency training along with state licensure. • New board certification and professional certificate programs will adapt to the evolution of the profession of pharmacy in its entirety.	• The role of credentialing and privileging will gradually evolve as pharmacists continue to expand their roles and scope of practice to include more direct patient care, leading to greater recognition by the public and hospital and health system leaders. • Formal credentialing and privileging of pharmacists will become an organizational requirement for hospitals and health systems and a requirement in Medicare Conditions of Participation.	• Professional development will be focused on developing application-based skills, credentialing and privileging, obtaining board certification and professional certificates, and engaging with ASHP. • Pharmacists will continue to retool and reinvent themselves to stay relevant with advances in therapeutics and technology through continuing professional development.	• Pharmacy leadership will adapt to changes in healthcare delivery and financing by focusing on demonstration of value, stronger matrixed relationships, data-driven decisions, succession planning, and management of the multigenerational workforce. • Pharmacy leaders gain visibility and credibility as leaders among other executive leaders in managing medication expenditures and utilization.

Vision for Pharmacy Technicians		
Pharmacy Technician Roles	Pharmacy Technician Education	Pharmacy Technician Certification
▪ Pharmacy technicians, from a standardized foundation of education and training, will expand into advanced roles, clinical roles, and quality improvement roles. ▪ New credentials will allow pharmacy technicians to interact with the public to a higher degree and complement the evolution of pharmacist roles.	▪ Minimum credentials for entry-level pharmacy technicians will expand to include a 2-year degree, ASHP/Accreditation Council for Pharmacy Education-accredited technician training, Pharmacy Technician Certification Board certification, and state licensure.	▪ For advanced-level pharmacy technicians, minimum credentials will also include advanced certification in an area of specialty based on practice setting and professional certificates pertaining to area of specialty.
Vision for Contributory Pharmacy Staff	**Vision for Well-being and Resilience**	**Vision for a Diverse and Inclusive Work Environment**
▪ Contributory pharmacy staff will supplement pharmacy departments with expertise in finance, analytics, business management, quality assurance, informatics, prior authorization, and supply chain management.	▪ Pharmacy staff will support individual efforts to develop and demonstrate coping skills and create systems to address risk factors known to cause burnout in healthcare, such as excessive workload, lack of autonomy, lack of reward, lack of community, and job–individual incongruence.	▪ Pharmacy departments in hospitals and health systems will embrace and rely on differing demographics in the pharmacy workforce, striving to achieve equity and diversity in all clinical, technical, and leadership roles.

Anticipated domains of change: Trends, Risks, Opportunities



VIEWPOINT

Response to COVID-19 in Taiwan
Big Data Analytics, New Technology, and Proactive Testing

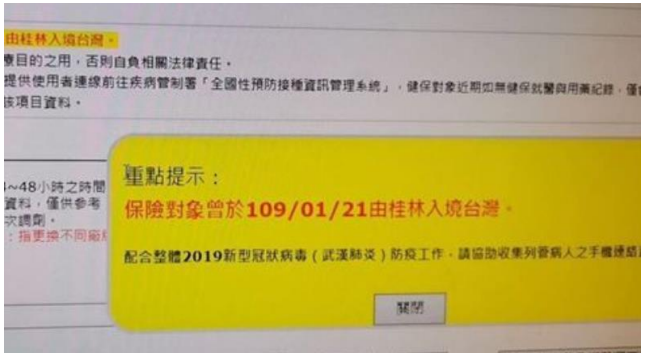
MADE IN TAIWAN

Recognizing the Crisis

- In 2004, the year after the SARS outbreak, the **Taiwan** government established the National Health Command Center (NHCC) that includes the Central Epidemic Command Center (CECC).

中央流行疫情指揮中心
Central Epidemic Command Center

- **Taiwan** leveraged its national health insurance database and integrated it with its immigration and customs database to begin the creation of big data for analytics.



VIEWPOINT

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MADE IN TAIWAN

- It also used new technology, including **QR code** scanning and online reporting of travel history and health symptoms to classify travelers' infectious risks based on flight origin and travel history in the past 14 days.

Border Control, Case Identification, and Containment

Low risk (no travel to level 3 alert areas)

- Persons were sent a health declaration border pass via SMS (short message service) messaging to their phones for faster immigration clearance.

Higher risk (recent travel to level 3 alert areas)

- Persons were quarantined at home and tracked through their mobile phone to ensure that they remained at home during the incubation period.

防範新型冠狀病毒肺炎
旅客入境健康聲明卡
Novel Coronavirus Health Declaration Card

姓名 Name	性別 Gender ☐ 男性 Male ☐ 女性 Female ☐ 其他 Other	身分證/護照號碼 ID card No. / Passport No.
航/船班 Flight No./ Vessel Name	在臺聯絡電話 Telephone in Taiwan	
在臺聯絡地址 Address in Taiwan		

請問您過去 14 天是否有下列情形 During the past 14 days,

1. 有發燒、咳嗽或呼吸急促症狀（已服藥者亦需填寫「是」）？
   Have you ever had fever, cough, or shortness of breath? (for those who had taken medications, please answer "Yes")
   □是 YES：□發燒 Fever □咳嗽 Cough □呼吸急促 Shortness of breath
   □否 No
2. 去過中國大陸武漢市？Have you ever been to Wuhan City, China?
   □是 YES □否 No

★入境 14 天內若有出入公眾場所，請務必配戴口罩！
★依傳染病防治法第 58 條規定，入境旅客應誠實填寫及繳交至疾管署檢疫站或入境證照查驗櫃檯，並配合必要檢疫措施；如有拒絕、規避妨礙或填寫不實者，依法處新臺幣 1-15 萬元罰鍰。
★Be sure to wear a mask in public places during following 14 days.
★According to Article 58 of the Communicable Disease Control Act, inbound passengers are required to accurately fill out and submit this card to Taiwan CDC quarantine stations or immigration counters upon arrival, and follow quarantine regulations. Any person who refuses, evades or obstructs abovementioned measures shall be fined NT$10,000 up to NT$150,000.

旅客簽名 Signature	中央流行疫情指揮中心 衛生福利部疾病管制署 關心您 Thank you for your cooperation. Central Epidemic Command Center Taiwan Centers for Disease Control
入境日期 Date of Entry (YYYY/MM/DD) YYYY / MM / DD	

VIEWPOINT

Response to COVID-19 in Taiwan
Big Data Analytics, New Technology, and Proactive Testing

MADE IN TAIWAN

Managing the Crisis

- Border control from the air and sea
- Case identification (using new data and technology)
- Quarantine of suspicious cases
- Proactive case finding
- Resource allocation (assessing and managing capacity)
- Reassurance and education of the public while fighting misinformation
- Negotiation with other countries and regions
- Formulation of policies toward schools
- Formulation of policies toward childcare
- Relief to businesses

Resource Allocation: Logistics and Operations

Set the price of masks

Use government funds and military personnel to increase mask production.

- On January 20, the Taiwan CDC announced that the government had under its control a stockpile of 44 million surgical masks, 1.9 million N95 masks.

Response to COVID-19 in Taiwan
Big Data Analytics, New Technology, and Proactive Testing

MADE IN TAIWAN

Taiwan's Outcomes so Far (as of February 24)

- The minister of health and welfare received approval ratings of more than 80% for his handling of the crisis, and the president and the premier received an overall approval rating of close to 70%.

- As of February 24, Taiwan has 30 cases of COVID-19. These cases represent the 10th-highest case number among countries affected thus far, but far fewer than the initial models predicting that Taiwan would have the second-highest importation risk.


Thank You!