Patient Classification Systems International
-PCSI 2025 - Quebec City, Canada

<u>Workshop 7</u> – 1.30pm – 4.30pm

Room 3 206A – Centre des congrès, Quebec City

“Measuring & Delivering Productivity in Outpatients”

9 September 2025

Workshop 7 – Agenda

Minutes	Time (each session)	Session Description
		HARD Start - 1.30pm
1.30pm-1.45pm	15	**Introductions** -Setting the scene - Outpatient services- What are they? Workshop Agreement **Discussion –** Main trends & Challenges - List
1.45pm-2.30pm	45	**Mark O'Connor** - The Irish Perspective - *Outpatient Productivity – Introduction and Opportunities*
2.30pm -3.00pm	30	**Winston Piddington** – The Abu Dhabi Perspective – *Putting the patient first – the new Abu Dhabi Outpatient Classification – challenges*
3.00pm- 3.15pm	15	**BREAK - Coffee/Tea**
3.15pm-3.30pm	15	/Cont. **Winston Piddington** – The Abu Dhabi Perspective – *Putting the patient first – the new Abu Dhabi Outpatient Classification*
3.30pm -4.15pm	45	**Solventum** - The International Perspective – *Solventum Outpatient Classification Systems & Indicators*
4.15pm-4.30pm	15	**Discussion/Open Floor** - "The future"
		HARD Finish time - 4.30pm

Workshop 7

- Introductions – *Presenters & attendees*

- Setting the Scene- what do we mean by *'Outpatients' or 'Ambulatory Care'*

outpatient

uk/ˈaʊt.peɪ.ʃənt/ us/ˈaʊt.peɪ.ʃənt/

NOUN [C]

a person who goes to a hospital for treatment, but who does not stay any nights there

an outpatient clinic

- *Ambulatory*
- *<u>Mostly:</u>*
  - *Acute care follow-ups,*
  - *Minor procedures,*
  - *Consultations (specialist care)*
  - *Allied health or nursing-provided services.*

- *<u>Different</u> from Primary or family care (General Practice v's Specialist)*
- *<u>Different</u> from Emergency care (? Urgent care)*

To the Workshop - Main trends & Challenges in Ambulatory Care

Trends

- Ambulatory healthcare is being redefined to be more sustainable & patient centered by:
  - more care outside hospitals → inpatient to outpatient shift, integrative & personalized medicine
  - focus on chronic disease prevention and population health
  - rapid digital adoption,
  - consumer-driven approaches and value-based care
  - risk- and outcome-based compensation to reward quality and efficiency rather than volume of services provide (e.g. bundled payments, risk-sharing contracts, value-based payment)

Challenges

Category	Challenge
Patient Complexity	Not equipped for high-acuity cases
Care Coordination	Fragmented, risk of duplicated care
Safety & Quality	Diagnostic or medication errors, infection, complications
Access & Equity	Coverage gaps, follow-up barriers
Workforce & Resources	Staffing shortages, burnout
Regulation & Oversight	Variability in standards & guidelines

solventum

Outpatient Productivity – Introduction and Opportunities

Mark O’Connor- National Productivity Unit, Health Service Executive

September 9th PCSI Quebec City

Agenda

No.	Items	Speaker
1	**‘Productivity’ Mentimeter Word Cloud**	All
2	**Brief background and context**	MO’C
3	**Productivity and Savings Taskforce Action Plan and Work Done So Far**	MO’C
4	**Your ‘Productivity Opportunities’ Word Cloud**	All
5	**Summary of feedback and finish**	MO’C

Productivity – Mentimeter Word Cloud

What words come to your mind when you hear ‘Productivity’

Mentimeter

What words come to your mind when you hear ‘Productivity’?

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Menti

Productivity Workshop

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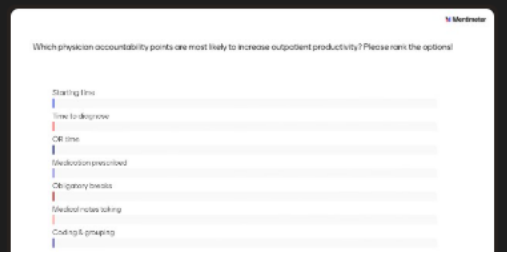


Productivity – delivering for patients and staff

"Productivity is delivering the maximum amount of patient health within the available resources"

Patients – More active role in their healthcare, more patients seen, shorter access times, higher quality and safer care, better health

Staff – More time for patients, safer care provision, fewer manual tasks, unlock and sustain initiatives, release potential, improved staff morale, better staff retention

Expenditure – Less waste and unproductive care, better tracking of costs, funding linked to patient cost, complexity and quality

Environmental – Less waste, better use of physical infrastructure, better use of technologies

Context Setting

Investment in Capacity

We have significant funding and resources invested in our health services….

- **Funding:** The health budget has increased by circa +€9.8bn (~70%) from €13.7bn in 2014 to €23.5bn in 2023
- **Resources:** Unprecedented growth in our staffing and funding investment in recent years, with a total net growth in across DoH Services of +25.4% equating to a net additional WTE of +25,785 staff

Demand Evolution

We face ever-increasing demand for our health services…..

- **Population:** The Irish population grew at an annual average increase of 1.3% from 2016 to 2022
- **Demographics:** Ireland has a rapidly growing and ageing population which will result in demand for our services continuing to growth significantly into the future
- **Forecasts:** Our ageing population is forecast to double for those over 65 years and treble for those over 80 years in the next two decades with 1.1m people living with one or more chronic diseases by 2030
- **Changing Models of Care:** In parallel with demographics, the manner in which care is delivered continues to evolve and system performance requires cognizance of this factor

Improving Productivity

Whilst progress has been made…..

- In 2023, the health service provided 3.7m outpatient appointments, 650k inpatient and 1.2m day case discharges. In addition, there were a further 1.7m Emergency Departments presentations last year.
- Waiting lists have fallen for the last 2 years, and the average waiting time for treatment continues to reduce.

There is much more to do…..

- **More people can be treated, and treated more quickly**, by improving the efficiency and productivity of our health service
- We must do everything we can to ensure that we **improve productivity** in our hospitals and community services

Our Productivity Focus

We need to……

- Deliver the **best health and social care outcomes** for **service users** in a **financially sustainable** way i.e. high value care
- Eliminate **unwarranted variation**; **duplication** and **waste** from our processes so staff have more time to provide care to the people we serve
- Embed continuous improvement and innovation, building on **what is known**, **what has worked well** and the **lessons learned** to maximise productivity
- Continue to **enhance prevention** and **early intervention** with a sustained focus on population and staff **health and wellbeing**

HSE National Service Plan 2025

Productivity word count = 48

Ciaran Devane, HSE Board Chairperson

“The Board’s overarching objectives for 2025 is to support improved efficiency and increased productivity, as well as the ongoing focus on improving the quality of care.”

Bernard Gloster, HSE CEO

“Our priority in 2025, therefore, must be a relentless focus on productivity and changed ways of working to make the best use of new and existing resources and ensure that public money is best used in the public interest.”

Productivity Governance

Productivity and Savings Taskforce

- Established in January 2024 – meets monthly
- Co-chaired by Secretary General of the DOH and the CEO of the HSE
- Programme to drive savings and productivity improvements across the HSE.

Productivity and Savings Taskforce Action Plan

National Productivity Unit established in HSE in June 2025 reporting to HSE CEO

Productivity and Savings Taskforce Action Plan – Action 2.1 OPD

2.1	Outpatient Department (OPD) Productivity and Behavioural Insight Measures	Finalisation of OPD measures initiated in 2024: • Publication of OPD productivity data (Visualisation System); • Optimise demand and capacity management including productivity and progress tracking deployed • Consultant performance management operating; including plan for delivery of supporting IT system.	• Increases in average numbers of outpatient appointments per relevant consultant • OPD toolkit deployed across all hospital sites / specialties and supporting the delivery of – optimising OPD appointment scheduling; deployment of standardised OPD planning processes including CNA and DNA management; use of OPD referral management decision supports; use of behaviourally informed content in hospital appointment correspondence to reduce DNAs; and deployment of data assets to support and enable more effective OPD planning. • Compliance with Sláintecare (SC) wait time target; • %/Number of 'Did not attend' (DNAs)		Q1 2025

Outpatients – Work to Date

Small NPU team visited 10 hospitals to observe high volume clinics in operation

Our objective was to explore the potential for demand management, capacity utilisation and data optimisation to support the delivery of OPD targets

- Staff engagement and feedback
- Number of rooms available
- Attendances: planned, actual, DNA/CNA, walk ins
- Staff WTEs: planned and actual
- Clinic time: planned and actual
- Time available for appointments: planned and actual

Report issued back to each hospital with findings

1. OPD Challenge & Key Findings

"Ensuring clinically appropriate OPD referrals receive an appointment within the 10 week Sláintecare target"

1. Key Finding: Opportunity to Optimise OPD 'Core' Capacity & Utilisation

- ✓ **Observed utilisation of capacity for direct patient activity was 80%**, with an observed range of 49%-128%
- ✓ **Clinics often used for non-patient facing activities** e.g. administrative work
- ✓ **Clinics may start late and over run** effecting downstream operations
- ✓ **Data is not being optimised** to support proactive planning and management of waiting lists. In particular the right information is not in the right hands, at the right time, to both understand the quantum of waiting lists or activity levels which will enable targets to be met. A fit for specific purpose mechanism to communicate this information and to develop the analysis is required
- ✓ **Potential to improve DNA and CNA management** in order to optimise capacity utilisation. On average, the DNA rate across all sites observed was 11%, ranging from 0% to 33% on the day
- ✓ **ICT challenges**, such as limited access to computers impacting efficiency.

2. Key Finding: Opportunity to Enhance OPD Clinic Planning

- ✓ **Scheduled clinic profiles are typically based on out-of-date templates** i.e. not referencing current WTE numbers, clinic times and potential clinical developments which may impact expected appointment times
- ✓ **Significant variance in the scheduling of individual clinics of patients per Whole Time Equivalent (WTE) per hour**, ranging from 1.4 to 4.1. (Noting this was over a range of specialties and clinics – it is understood this will always vary to an extent depending on these factors).
- ✓ **Clinics not being planned to available capacity.** Clinics observed were **scheduled to 74% of their available capacity** on average, with a range of 39%-113%. This was largely related to the utility of out-date-templates referenced above.

2. Opportunity 1: Baseline Core Capacity

This is the opportunity NPU in collaboration with the Regions will implement over a 6–10-week sprint across all OPD sites and specialties.

Opportunity 1	Solution	Impact	Timeframe
To determine, optimise and utilise OPD 'core' capacity at site and specialty level	1. **Governance:** Identify single points of accountability at specialty, site, regional and national levels for OPD 'core' capacity management where they don't already exist. Where they do exist, they must be mandated to align to this standardised clinical planning approach 2. **'Core' Capacity Baselined:** OPD 'core' capacity baseline established at site level with direct input from specialty clinics to ensure clinics are planned to utilise 100% of their existing capacity (noting DNA rates are currently c10%).	• OPD baseline capacity determined to support optimal utilisation of existing resources • Enables more efficient and effective OPD planning to deliver against appropriate OPD targets • Supports the elimination of unwarranted capacity utilisation variation across clinical specialities / sites	• **Rapid:** 6-10 week sprint across all sites/specialities

3. Opportunity 2: Standardised Approach to Clinic Planning

Following this, there is an opportunity to standardise the approach to specialty clinic planning at site level.

Opportunity 2	Solution	Impact	Timeframe
No standardised approach to specialty clinic planning at site level	1. **Clinic Planning Tool:** Implement a practical and standardised OPD clinic planning tool to support acute hospitals optimising the utilisation of their 'core' capacity 2. **Data Asset Utilisation:** Utilise data assets to ensure relevant stakeholders have the data on wait lists/times – and critically activity levels which will lead to Sláintecare and other targets being achieved within prescribed timeframes 3. **Physical Infrastructure Utilisation:** Mandate the use of OPD physical infrastructure exclusively for patient-facing activities 4. **Optimal Alignment of Capacity Levers:** Ensure incentives that reward insourcing, outsourcing and commissioning are optimally aligned to 'core' capacity ensuring full utilisation of all available resources within the public system e.g. POCC, rostering.	More efficient and effective specialty clinic demand and capacity management enabling; • Improved utilisation of OPD resources and optimal clinic throughput (based on sample of clinic's visited there is at least a 10% productivity opportunity (i.e. c360k additional **'new'** attendances) • Improved management of CNA's/DNA's • A planned 'step wise' improvement in compliance with Sláintecare wait time targets	• **Short Term:** 6-12 mths

6. OPD Sample Baseline Data Capture

At site level, an OPD data capture will be conducted to gather the relevant information ***(sample below)*** aligned to OPD clinics and clinic profiles, this will require direct input from specialty clinics.

From the data captured, the **OPD 'core' capacity baseline** will be established at site level to ensure clinics are planned to utilise 100% of their existing capacity (noting DNA rates are currently c10%).

Sample OPD Baseline Data Capture

OPD Clinic Information				Clinic Time			WTE			
Unique Identifier	Clinic Date	Hospital	Specialty	Start Time	End Time	Duration	Consultant	NCHD	ANP	Total
	01/01/2025		Dermatology	09:30	12:30	03:00:00	1	1	0	2
	02/01/2025		Dermatology	09:00	12:00	03:00:00	1	2	1	4
	03/01/2025		Dermatology	10:00	12:30	02:30:00	1	1	2	4
	04/01/2025		Plastic Surgery	13:00	16:00	03:00:00	1	1	1	3
	05/01/2025		Plastic Surgery	12:30	16:00	03:30:00	1	0	1	2

No. of Patients per Appointment Type						Scheduled Average Time per Appointment Type			
New (Face to Face)	Return (Face to Face)	New (Virtual)	Return (Virtual)	Ward/Walk-In	Total	New (Face to Face) Average Apt Time	Return (Face to Face) Average Apt Time	Virtual Average Apt Time	Ward/Walk In Average Apt Time
5	2	0	1	0	8	20	15	15	20
4	3	0	2	0	9	20	15	10	20
7	2	1	1	0	11	25	10	15	25
2	1	2	3	0	8	30	25	15	30
3	1	0	1	0	5	30	20	10	30

Outpatient Department Clinic Planning Tool

Capacity		
Start time to end time	Duration in minutes	180
Consultant, NCHD, ANP staffing	Number of WTE	4
Available minutes	Duration * WTE	720
Schedule		
Number of patients	New, return, virtual	30
Average appointment times	New, return, virtual - minutes	20
Planned schedule	Minutes	600
Planned vs capacity		83%
Possible additional appointments		6

Hospital 1- Opportunity, Implementation & Impact

1. Baselined core capacity utilisation (41 clinics)

New Patients	Return Patients	Total Patients
315	716	**1,081**

Current Utilisation = 80%

2. Opportunity to schedule additional new patients

Target Utilisation = 85%

Potential Opportunity New Patients (weekly period)	Potential Opportunity New Patients (6 month / 23-week period)
150-175	3,450-4,025

3. OPD planning tool implemented

13 clinics reviewed week 2

Realised Opportunity New Patients (weekly period)	Realised Opportunity New Patients (6 month / 23-week period)
+24 (15%)	+552*

4. Improving Sláintecare (SC) target compliance

Wait List May 25	% SC Compliance May 25	Realised Opportunity = 45% SC Compliance (6 month / 23-week period)	Potential Additional Opportunity = 50% SC Compliance (6 month / 23-week period)
9,975	39%	+552*	+512*

*future referral rate dependent

5. Actionable Insights

- ✓ **Improving 'core' capacity utilisation:** Realised opportunity of +24 new patients in a 'typical' week increases current utilisation from 80% to c.81%.
- ✓ **Improving Sláintecare target compliance:** Realised opportunity of +552* new patients over a 6 month period increases Sláintecare compliance from 39% to estimated c.45%. Potential additional opportunity of +512* new patients over a 6 month period delivers 2025 Sláintecare compliance target from c.45% to estimated c.50%.

*future referral rate dependent

1st Deployment Site Learnings: Hospital 1 feedback

The hospital is committed to supporting change management and the future deployment of the OPD Clinic Planning Tool. The following high-level observations are intended to guide and inform this support.

- **Senior Clinical and Operational Leadership is Essential**
  - Leadership drives adoption and resolves systemic barriers.
  - Their support ensures alignment with strategic and operational goals.
- **Culture & Change Management**
  - Embedding new planning practices requires ongoing engagement and mindset shift.
  - Regular reviews help adapt to operational changes and sustain improvements.
- **IT Limitations (Legacy Patient Administration System)**
  - The existing IT system does not enable flexible OPD clinic scheduling.
  - IPMS upgrade not expected until 2027/2028. Bringing this forward would be a significant enabler of OPD optimisation and overall hospital productivity, e.g. would enable RPA automation, bed management, improved system interoperability.

Hospital 1 Projected Impact Reporting (progress update w/e 22/08)

Application of OPD Planning Tool

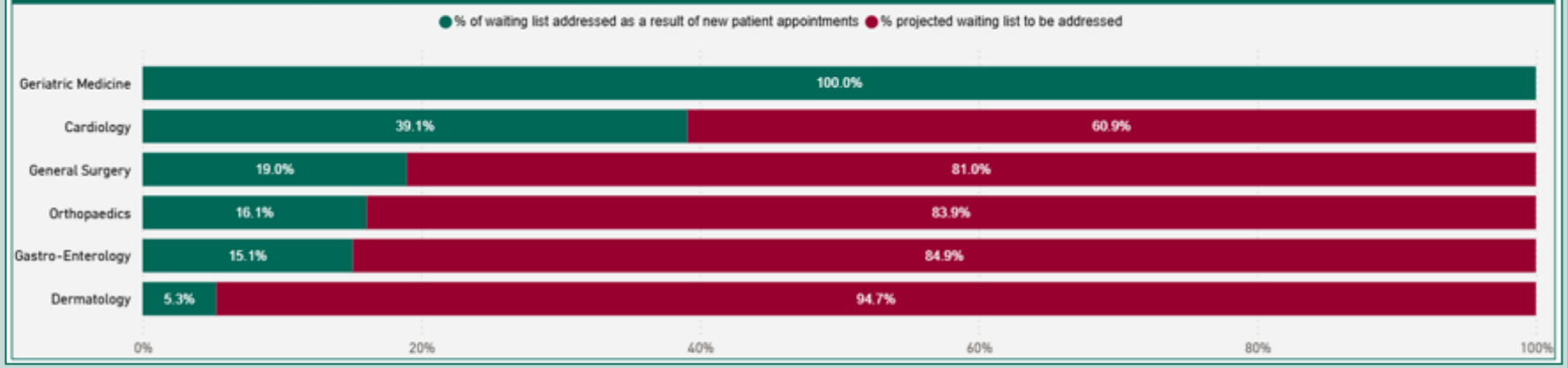
	No. Clinics		New Patients Added		
	Baselined	Reviewed	Realised	Forecast	Total
Existing Clinics	41	21	874	0	874
New Clinics	N/A	6	138	1,219	1,357
Total	41	27	1,012	1,219	2,231

Projected Impact: Application of OPD Planning Tool

	Baseline	Over 6 month period	
	June 2025	Without Planning Tool	With Planning Tool
Waiting List	10,385	11,424	9,193
SC Compliance	38%	38%	50%+

- Projections are future referral rate dependent, however, c. 10% increase in Waiting List has been applied, aligned to recent trend.
- New patients are assumed to be scheduled in chronological order.

Application of OPD Planning Tool: Projected Impact on Waiting List by Specialty Clinic Reviewed

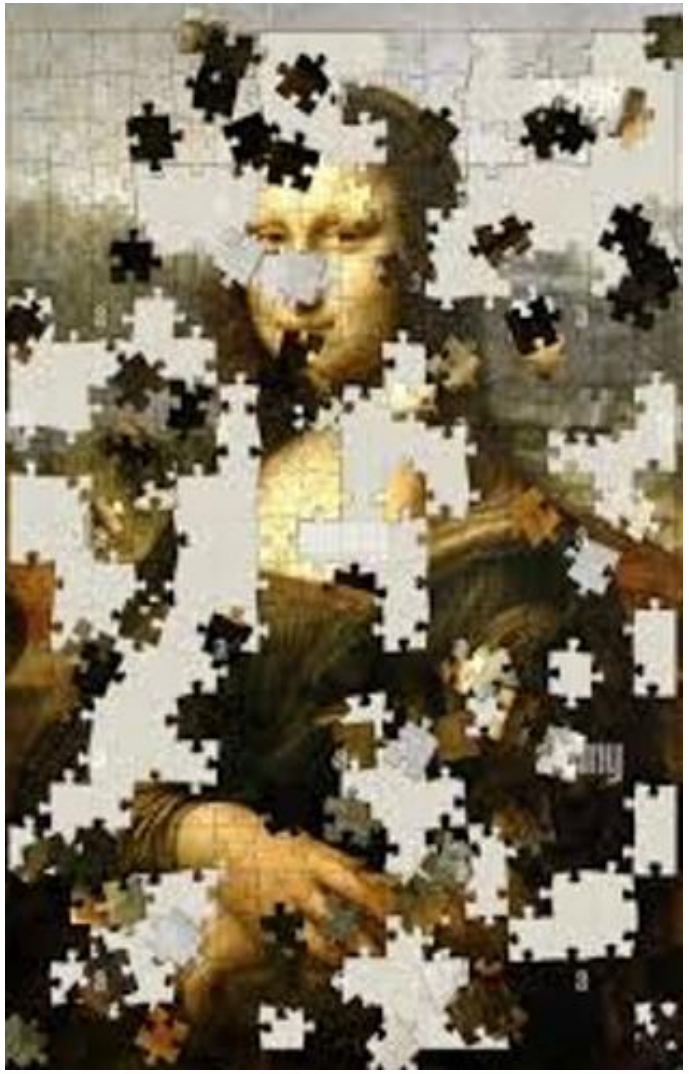


- Projected Impact over a 6 month period assumes impact takes effect from the date the clinic changes are applied, staggered due to operational deployment.
- 6 new clinics have been established and optimised with the OPD planning tool in the following specialties (+1 Geriatric Medicine, +2 Cardiology, +1 Gastro Enterology, +1 Respiratory Medicine, +1 Endocrinology).

OP Classification – a missing piece of the jigsaw

If patients are by definition the same why across hospitals / consultant are these variable

- New / return rates
- Appointment times: why are appointment times for similar patients different
- Conversion rates for surgery / admission / medication



What's in it for her?

Mentimeter

Do I need a classification to measure outpatient productivity?

- Yes
- No
- Not sure

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Productivity Workshop

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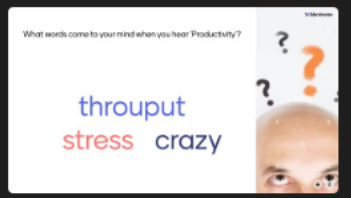
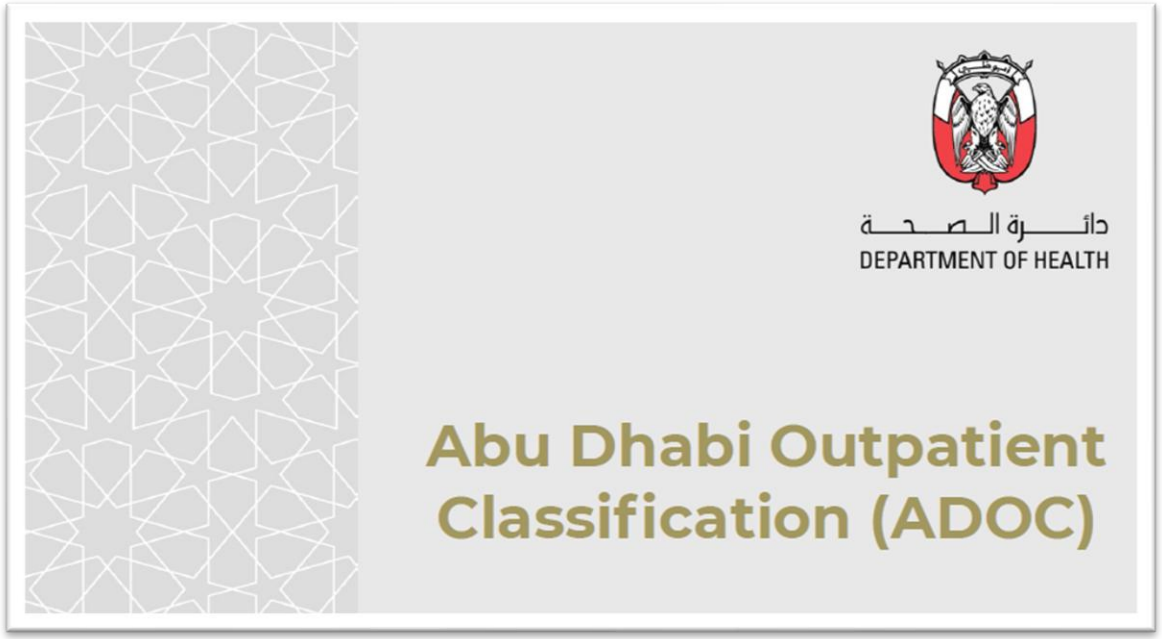


The Abu Dhabi Outpatient Classification (ADOC)

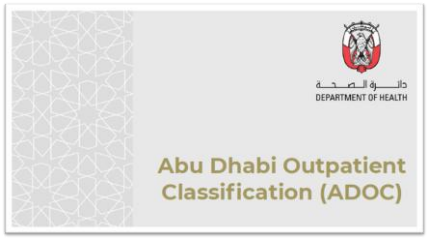


"Putting the patient first – the new Abu Dhabi Outpatient Classification – challenges"

Outpatient & Emergency Care Reimbursement Reform (OECRR)
Abu Dhabi - Department of Health

ADOC: The Strategy

The OECRR embodies the VBHC vision for healthcare in Abu Dhabi, striving to create an equitable, sustainable system centered on delivering high-quality ambulatory care



The 8 OECRR principles

1. Maintain a focus on the **patient** as the center of care across reimbursement models and care settings
2. Ensure that reimbursements support **quality** patient outcomes, allowing patients to benefit from high-quality care
3. Support market **sustainability** by balancing healthcare funding risk and accountability across regulator, payers, and providers
4. Ensure care reimbursement is linked to the **true service delivery needs of the patient** and provides a fair and equitable reimbursement to providers
5. **Tailor** the system to meet Abu Dhabi's population needs, account for system variations, and maximize **equitable** access for its people
6. **Minimize disruption** of the reform implementation on the healthcare sector, while maintaining "controlled urgency"
7. Reduce administrative burden and **complexity** in design and implementation across health players and embed **flexibility**
8. Foster **high-level engagement and collaboration** across all health ecosystem players, with a focus on "common ground" objectives

The transition from volume to value-based funding is part of a wider movement aimed at tackling the evolving needs of Abu Dhabi healthcare systems

Abu Dhabi Outpatient Classification (ADOC)

Challenges in the local environment

UAE population aged 65+ has **increased more than ten-fold** since 2010, rising from 0.2% to 2% of the total population

World Bank (2023)

Increasing demand for services, with Abu Dhabi ambulatory care visits averaging 8.3 per patient p.a., versus the European average of 6.5

World Health Organisation, DoH data

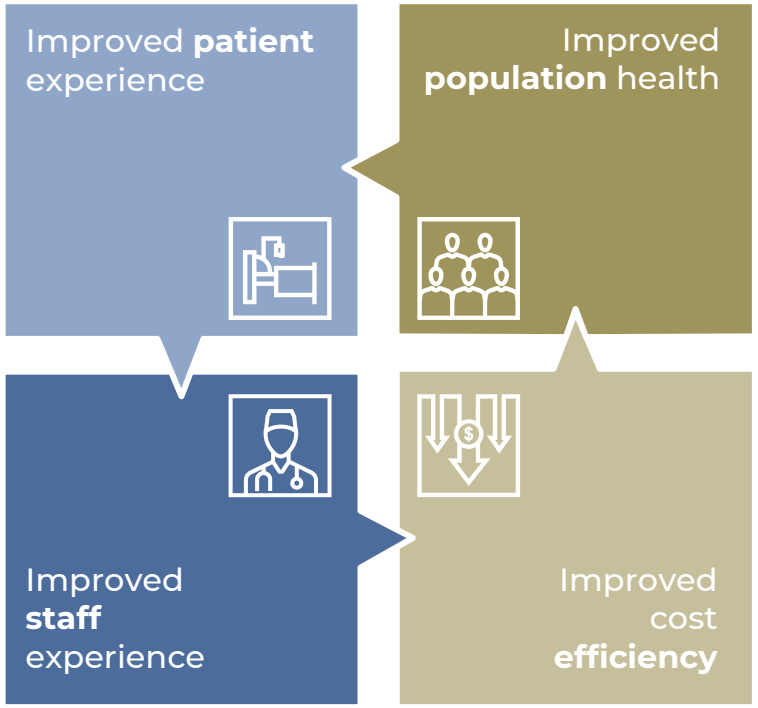
Non-communicable diseases are responsible for close to 80% of all UAE deaths, with cardiovascular disease the leading cause of mortality

World Bank, UNDP, WHO (2023)

UAE's forecasted **medical cost** trend rate for 2024 is estimated at **11%**, more than five times the forecasted 2024 inflation rate of 2%

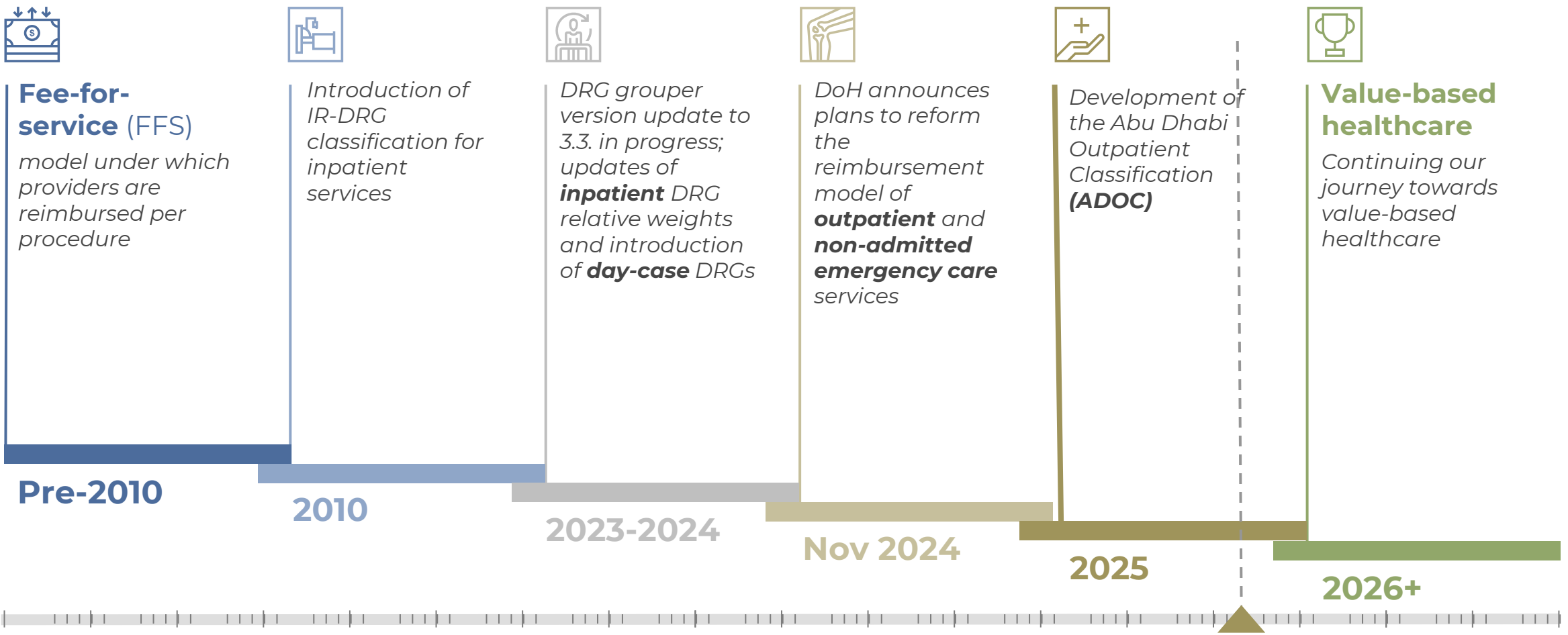
Marsh (2024)

The quadruple aim of VBHC



The Department of Health is continuing its journey towards a Value-Based Healthcare (VBHC) system in Abu Dhabi

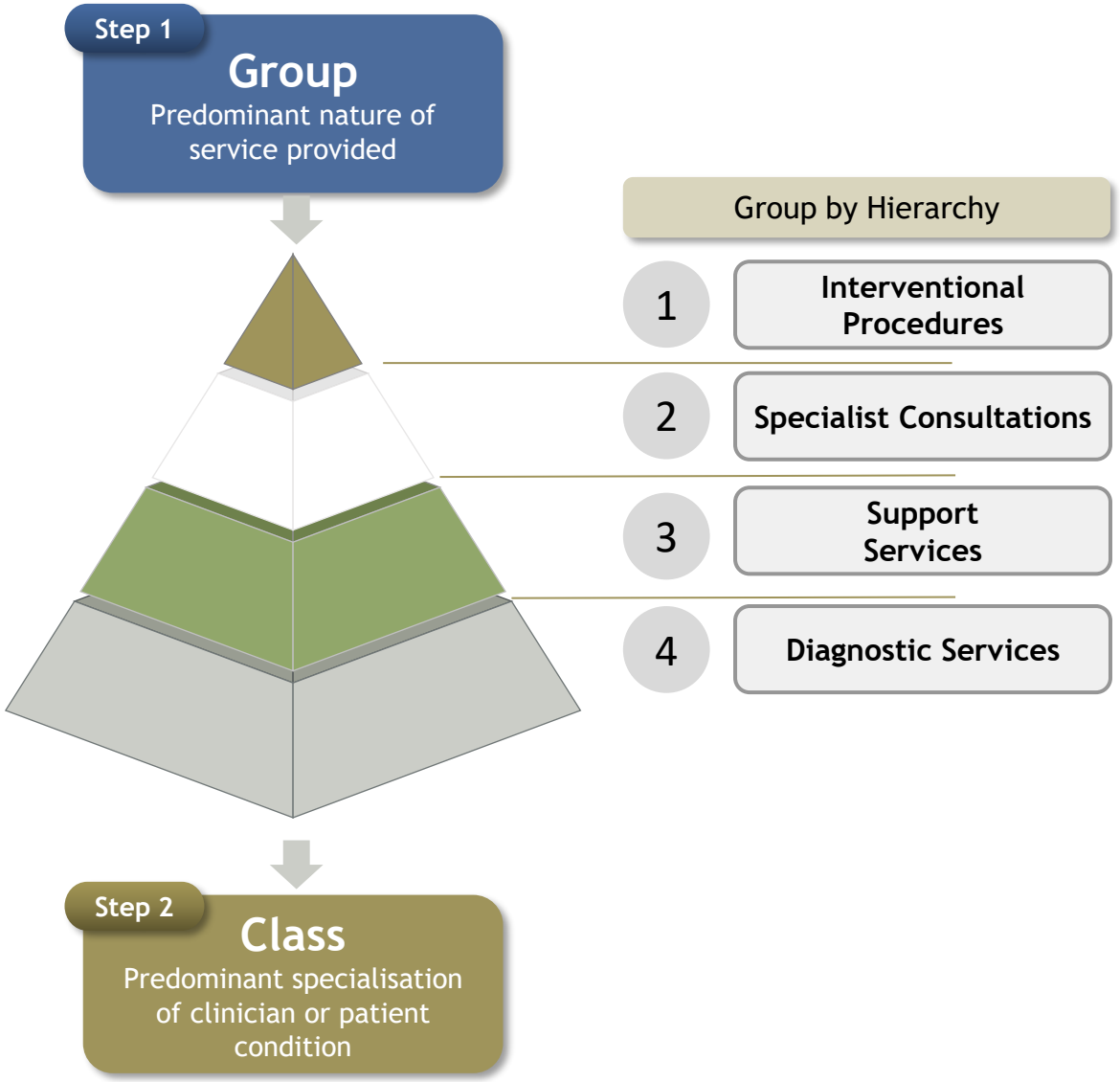
Abu Dhabi Outpatient Classification (ADOC)



ADOC: The Classification

Key Principles

- ADOC is specialty-based
- Report one ADOC class per service event[1] and if relevant, diagnostics
- Choose the ADOC class based on:
  - The predominant nature of the activity (group); and
  - Speciality of the clinician and/or activity (class)
- If a service event involves more than one ADOC class
  (i.e. procedure and consultation), give precedence to the
  more resource intensive activity (i.e. procedure)



[1] *An outpatient patient service event is defined as an interaction between one or more clinician(s) with one patient in an outpatient setting, which must contain therapeutic/clinical content and result in a dated entry in the patient's medical record.*

ADOC consists of 124 classes spanning 4 groups

Abu Dhabi Outpatient Classification (ADOC)

Group Predominant nature of service provided	**Interventional Procedures**	**Specialist Consultations**	**Support Services**	**Diagnostic Services**
Class Predominant specialisation of clinician or patient condition	• **P1.** Hyperbaric medicine • **P2.** Interventional imaging • **P3.** Minor surgical • **P4.** Endoscopy – gastrointestinal • **P5.** Endoscopy – urological / gynaecological • **P6.** Endoscopy – ENT • **P7.** Chemotherapy treatment • **P8.** Radiation therapy – treatment • **P9.** Radiation therapy – simulation and planning • **P10.** Minor medical procedures • **P11.** Pain management interventions • **P12.** Renal dialysis	• **C1.** Anaesthetics • **C2.** Pain management • **C3.** Internal medicine • **C4.** General surgery • **C5.** Paediatric medicine • **C6.** Paediatric surgery • **C7.** Developmental disabilities • **C8.** Gynae… • **C9.** Gyn… onco… • **C…** • **C11.** …ics – manag…ment of pregnancy without complexity • … • **C52.** Breast • **C53.** Family medicine, general practice and primary care	• **S1.** Rehabilitation • **S2.** Aids and appliances • **S3.** Clinical pharmacy • **S4.** Hydrotherapy • **S5.** Occupational therapy • **S6.** Physiothe…apy • **S7.** Sexual … • **S8.** Soci… coun… • **S…** • **S…** • **S11.** …ics • **S12.** A…ology • **S13.** Speech pathology • **S14.** Nutrition / dietetics • **S15.** Orthotics • **S16.** Podiatry • **S17.** Midwifery and maternity • … • **S51.** Infections diseases	• **D1.** General imaging • **D2.** Magnetic resonance imaging (MRI) • **D3.** Computerised tomography (CT) • **D4.** Nuclear medicine • **D5.** Pathology • **D6.** Positron emission tomography (PET) • **D7.** Diagnostic mammography • **D8.** Clinical measurement

Non – exhaustive list

Non – exhaustive list

ADOC uses five general counting rules to determine which outpatient activities qualify as countable and therefore reimbursable service events

1. Only **one** outpatient service event may be counted per patient within a given **calendar day**

2. However, **multiple** service events may be counted for the same patient on the same day only where each event involves distinctly **different clinical content** or involves **Support Services** (S-Series)

3. Regardless of the number of clinicians involved in the service event, it must be **counted once** only

4. Services provided to patients in the **admitted**, **emergency care**, **home care or daycare** settings must **not** be counted as outpatient service events

5. **Diagnostic services** do not qualify as standalone outpatient service events; diagnostic services are counted **as part** of the outpatient service event to which they are linked

There are an additional four supplementary counting rules which provide guidance on specific care delivery scenarios

1. One service event may be counted per patient discussed at a **multidisciplinary case conference** (MDCC) where the patient is not present, conditional on the involvement of at least three clinicians representing different specialties

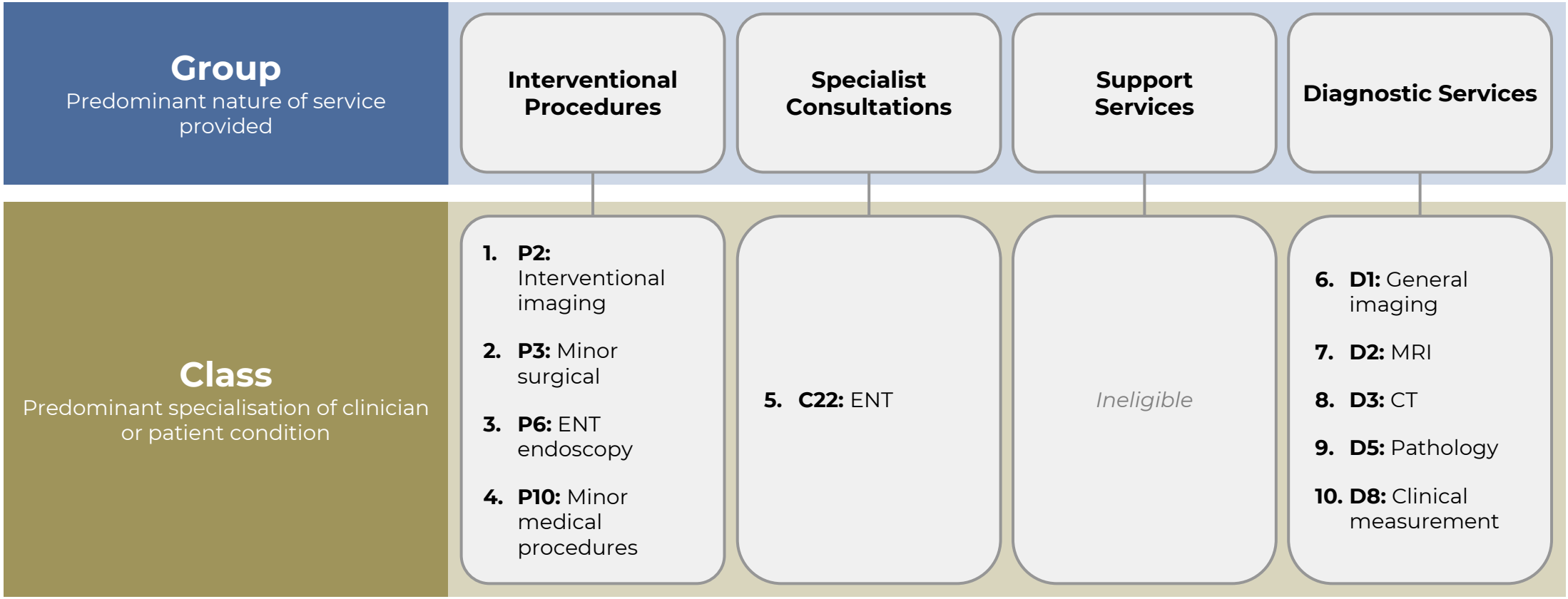
2. Interactions between a clinician and patient using information & communication technology (ICT) such as **telehealth** may be counted as service events as long as the content of the interaction may be considered a substitute for a face-to-face consultation

3. Patient consultations involving **patient education** may be counted as a service event providing therapeutic/clinical content is involved and relevant information is documented within the patient's medical record

4. One service event may be counted for each member of a group of patients that receives therapeutic/clinical service in a **group format**; this does not include family members and/or carers accompanying a patient to an appointment

ADOC is designed to be clinically meaningful but simple to use

For example, an ENT specialist would typically only use **10** ADOC classes.



ADOC is designed to be clinically meaningful but simple to use

For example, an ENT specialist would typically only use **10** ADOC classes.

Group
Predominant nature of service provided

Interventional Procedures

Class
Predominant specialisation of clinician or patient condition

1. **P2:** Interventional imaging
2. **P3:** Minor surgical
3. **P6:** ENT endoscopy
4. **P10:** Minor medical procedures

P6: Endoscopy - respiratory/ear, nose and throat

Identifying attributes	
Number	P6
Name	Endoscopy - respiratory/ear, nose and throat
Category	Interventional Procedures
Affected body part	MDC 03 Diseases and disorders of the ear, nose, mouth and MDC 04 Diseases and disorders of the respiratory system
Definition of service	Endoscopic investigation and/or treatment of the respirato system (lung, pleural cavity, bronchial tubes, trachea, uppe respiratory tract and nerves and muscles of breathing) and nose and throat (ENT).

Guide for use	
Activity	*Inclusions:* Endoscopic procedures of the respiratory system and/or EN example: - Bronchoscopy - Medical thoracoscopy - Fibre optic examination of the nasopharynx and lar - Nasendoscopy - Sinoscopy - Otoscopy - Endobronchial ultrasound guided biopsy - Dilatation of tracheal stricture - Bronchial or bronchoalveolar lavage - Fine needle aspiration - Removal of aspirated foreign bodies *Exclusions:* - Medical consultation for respiratory conditions (C23 - Medical consultation for ENT conditions (C22) - Endoscopies performed as daycase procedure

Inclusions:

Endoscopic procedures of the respiratory system and/or ENT, for example:

- Bronchoscopy
- Medical thoracoscopy
- Fibre optic examination of the nasopharynx and larynx
- Nasendoscopy
- Sinoscopy
- Otoscopy
- Endobronchial ultrasound guided biopsy
- Dilatation of tracheal stricture
- Bronchial or bronchoalveolar lavage
- Fine needle aspiration
- Removal of aspirated foreign bodies

Exclusions:

- Medical consultation for respiratory conditions (C23)
- Medical consultation for ENT conditions (C22)
- Endoscopies performed as daycase procedure

For example…

Example

1   

Patient sees ENT specialist for consultation

Example

1

ADOC class

C22. Ear, nose & throat (ENT)

Example

1. 

   Patient sees ENT specialist for consultation

2. 

   ENT specialist performs nasal endoscopy on patient

Example

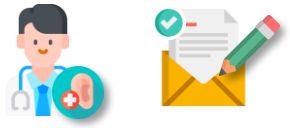
1 

2 

ADOC class

P6. Endoscopy – respiratory / ENT

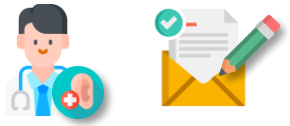
Example

1. 
   Patient sees ENT specialist for consultation
2. 
   ENT specialist performs nasal endoscopy on patient
3. 
   Specialist refers patient for CT scan of sinuses and blood test

Example

1 

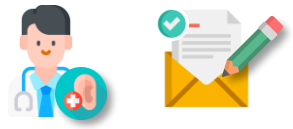
2 

3 

ADOC class

P6. Endoscopy – respiratory / ENT

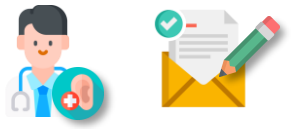
Example

1.  Patient sees ENT specialist for consultation
2.  ENT specialist performs nasal endoscopy on patient
3.  Specialist refers patient for CT scan of sinuses and blood test
4.  Patient gets the CT scan done

Example

1 

2 

3 

4 

ADOC class

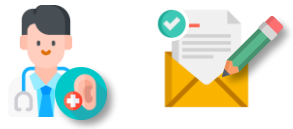
P6. Endoscopy – respiratory / ENT

+

D3. Computerised tomography (CT)

Zero-weighted but still reported

Example

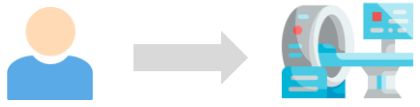
1.  Patient sees ENT specialist for consultation
2.  ENT specialist performs nasal endoscopy on patient
3.  Specialist refers patient for CT scan of sinuses and blood test
4.  Patient gets the CT scan done
5.  Patient gets blood test

Example

1 

2 

3 

4 

5 

ADOC class

P6. Endoscopy – respiratory / ENT

+

D3. Computerised tomography (CT)

+

D5. Pathology

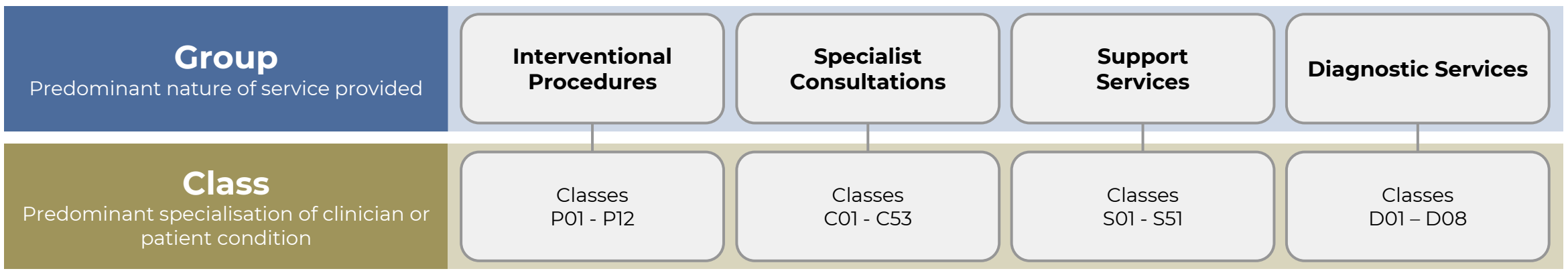
Zero-weighted but still reported

Zero-weighted but still reported

ADOC in practice: a summary

Abu Dhabi Outpatient Classification (ADOC)

- ADOC is a **clinically relevant, administratively simple** classification
- Designed for **Abu Dhabi**
- Encourages **patient-centred, outcome-driven** outpatient care
- Designed for **reliable shadow billing** and future **value-based funding**



ADOC: Measuring and Delivering Productivity in Outpatients –

The Challenges

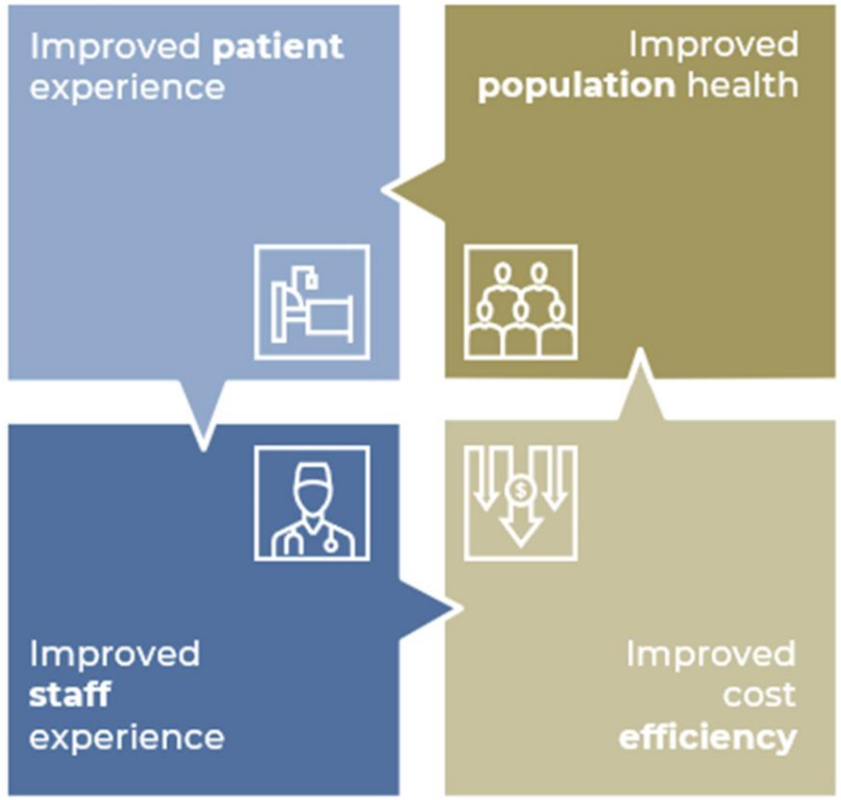
Challenges – how do you transition from a Fee for Service system to a Value-based healthcare (VBHC) *patient-focused* system

Abu Dhabi Outpatient Classification (ADOC)

The Fee For Service System Focus

- Great for growing health systems, but what about the incentives?
  - Different incentives
  - *No (or limited)Provider risk –*
- Revenue Cycle Management (RCM) the focus (PS: not *their* fault!)
- Issues with setting '*incentives*' – what are the incentive for care providers to focus on the patient, rather than income ?
- Patient focus??? Issues with patient delivery overservicing – ? Unsafe

The focus of Value-based Health Care

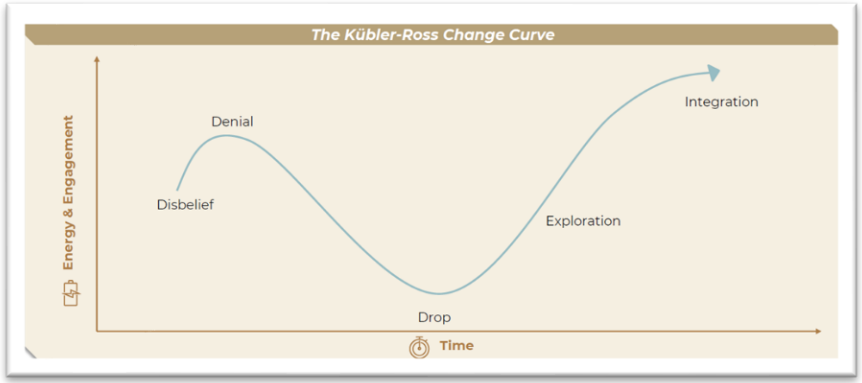


Putting the patient first

– Easy to say, hard to do if culture & incentives are not <u>set</u> right

- **Culture** – strategic leadership (top-down) **or** *'Ringhi-sho'* (bottom up).
  - *Macro – W*hat is needed? What is the focus? – *The patient vs personal gain –*
  - *Micro – S*etting the right *<u>incentives</u>* for outpatient performance (Note: **bundling**)

  …. This then drives …
- **Change Management** –
  - Incentives or Regulatory power – *When to use each*
  - Management ability - ***<u>Influence and nudge</u>***



- **Information Technology**
  - How much data is enough? What does it do? Can it be used to ***<u>Influence and nudge</u>***
  - You will be waiting forever for the perfect system - *get on with it with what you have*
  - Adapt and *'kaizen'* (continuous improvement)

الإمارات
THE EMIRATES

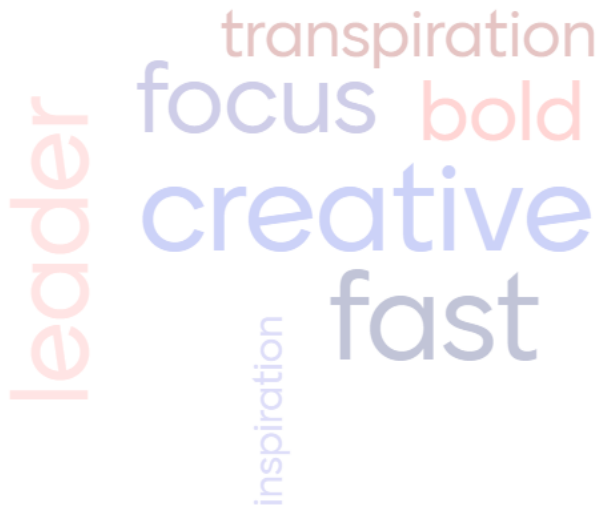
دائرة الصحة
DEPARTMENT OF HEALTH

Talking Points

1. Ambulatory Care - Challenges & Mitigation Strategies
2. Full Capture of Ambulatory Documentation & Coding
3. Understanding your ambulatory case complexity (CMI)
4. Benchmarking – how do I compare to my peers?
5. Ambulatory risk adjustment
6. Complications plausibly related to procedures/potentially preventable
7. 30-day event rates - post discharge complications
8. Analysis of ambulatory expenditure distribution
9. Ambulatory case studies:
   - Hot spots and areas of focus
   - Spectrum of interventions
   - Areas of cost savings/containment.

Mentimeter

What challenges do you face in outpatient care productivity?



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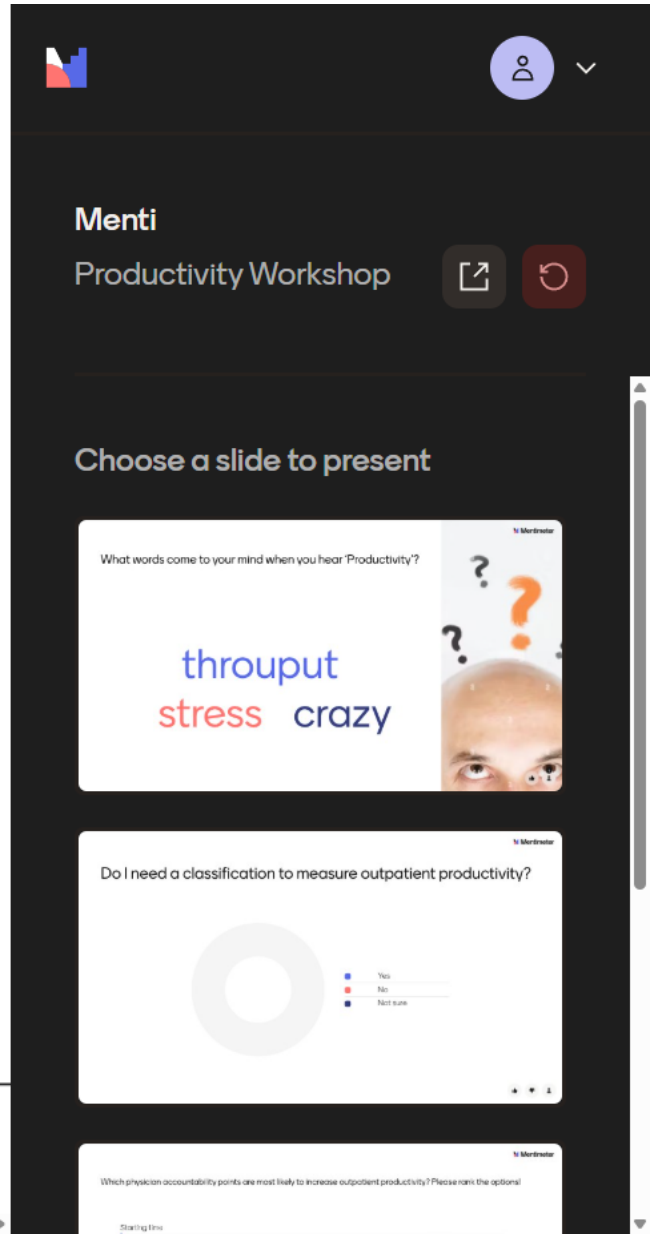

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Current Challenges in Outpatient Productivity

workforce shortages and burnout	• directly limit capacity to see patients, extend waiting times, and increase stress for remaining staff • increase absenteeism, difficulties in recruiting and retaining skilled staff more, persistent exhaustion and disengagement
rising patient complexity	• multimorbidity and later-stage conditions
inefficient or fragmented administrative systems	• manual documentation, fragmented health records, or poor coordination with external providers, absorb clinical time that could be devoted to direct care
organizational and management shortcomings	• misallocation of available staff due to ineffective scheduling, poor workforce planning, or lack of autonomy for managers
problematic scheduling	• High, fluctuating patient volumes and poor scheduling systems can lead to overbooked clinics, uneven workloads, and excessive wait times, all of which reduce the ability to optimize staff and space utilization
systemic bottlenecks in related healthcare and social services	• Barriers to timely social care or post-acute support can prolong hospital stays, increase readmissions, and tie up resources that could be used for new outpatients

Strategies for Ambulatory Workflow/Throughput Optimization

General

- **Reduce wait times, no-shows, late arrivals**
  - Online appointment systems, digital forms, automated reminders
- **Reduce variability, avoid missed steps**
  - Standardized clinical and administrative pathways, checklists for common scenarios
- **Reduce duplication & facilitate communication/collaboration**
  - Adoption and integration of EMR with alerts
- **Match staff availability to demand**
  - Team-based care models to utilize all skill levels effectively
- **Ongoing performance review**
  - Balance team's workload by cohort complexity (CMI)
  - Lean, 6Sigma, PDCA
- **Prevent downstream revenue issues**
  - AI scribes and (semi)autonomous coding with alerts for missing documentation/coding & real-time claim scrubbing

Surgical

- **Minimize errors and delays**
  - Standardized pre-op checklists and patient instructions across specialties
- **Adjust OR block times dynamically according to surgeon performance, case mix, and historical trends**
  - Surgical predictive analytics
- **Release unused OR blocks early & speed-up OR turnover between cases**
  - Team parallel processing, use pre-packed surgical kits, and real-time status tracking with visual boards
- **Reduce procedure delays caused by supply shortages**
  - Barcode/RFID systems and predictive analytics
- **Identify inefficiencies and incentivize efficiency**
  - Track first-case-on-time starts, average procedure time, OR turnover, and staff utilization

Medical

- **Facilitate patient movement through triage, assessment, and follow-up**
  - Team-based care models
- **Implement evidence-based care pathways**
  - EHR & clinical decision support tools
- **Increase access, reduce unnecessary onsite visits, and better manage follow-up care**
  - Leverage Telemedicine
- **Optimize consult-to-treatment times for chronic disease management and preventive care.**

Holding physicians accountable for:

- **ordered tests**,
- **start time**,
- **time to diagnose and**
- **OR time,**
- **medication prescribed**
- **breaks,**
- **documentation and**
- **coding** (let's discuss!)

Mentimeter

Which element affects productivity most? Please rank the tasks!

Activity starting time

Time to diagnose

OR time

Medication prescribed

Obligatory breaks

Medical notes taking

Coding & grouping

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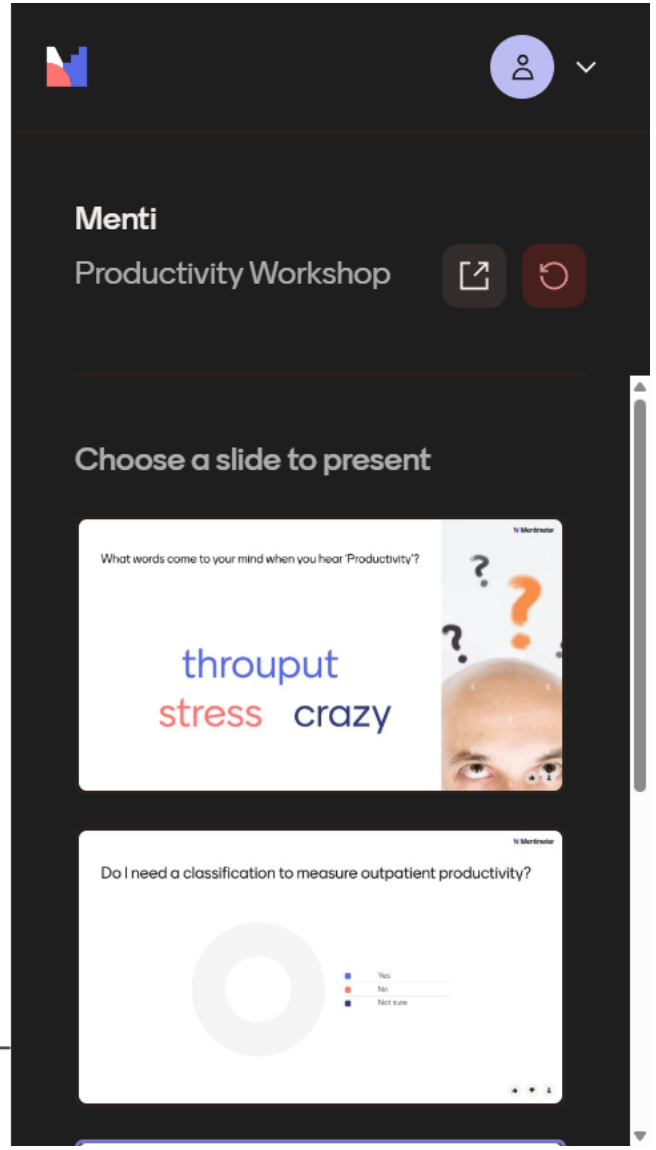

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Increasing Productivity in Ambulatory Care

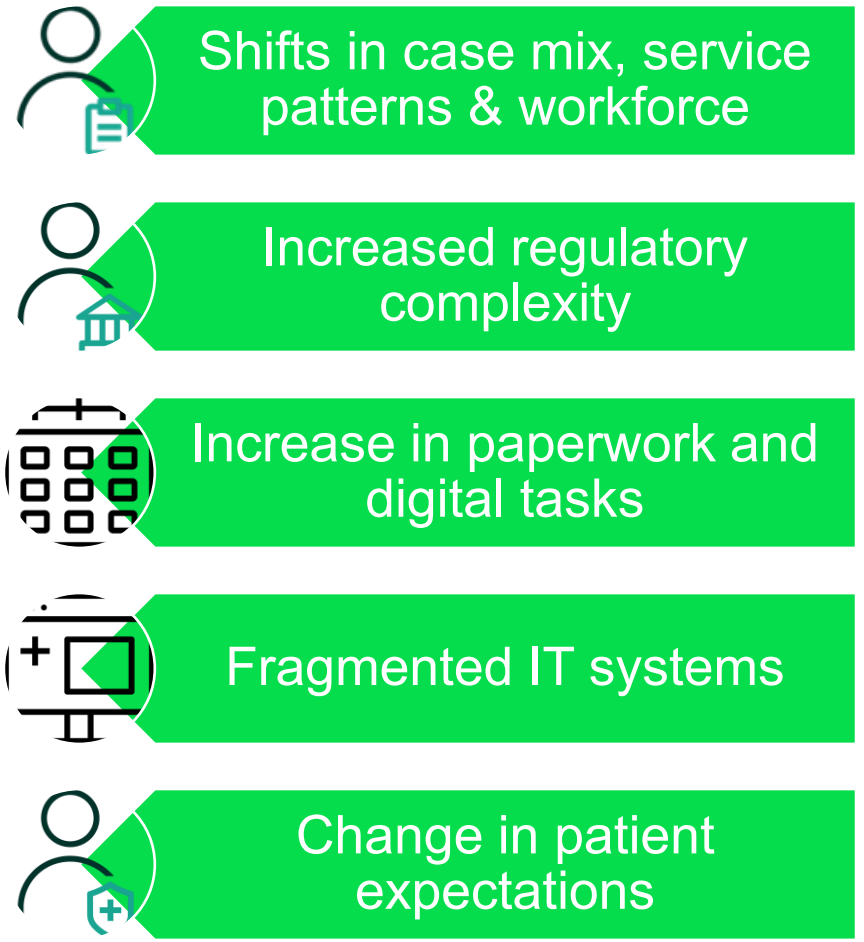
Core priorities

Optimize scheduling and workflow	•minimize no-shows and fill gaps: digital self-scheduling, open-access slots for same-day appointments, automated reminders, and strategic overbooking •minimize idle time, wait times, and missed appointments: analyze patient flow, peak hours, and bottlenecks
Enhance care coordination	•reduce hospitalizations and streamline follow-up: multidisciplinary care management teams with assigned patient cohorts
Effective workforce structuring & engaging	•Map out all staffing roles, assess gaps, train or cross-train staff, and encourage role expansion •daily stand-up and continuous feedback
Reduce unnecessary work and administrative burden	•standardized referral, handoff, and documentation processes to reduce duplication and errors, while ensuring that key information travels with the patient •**Integrate EMR, intelligent dictation, AI scribes and autonomous coding, mobile solutions to automate manual work—speeding up documentation, rooming, results reporting, and care coordination**
Data-driven, iterative quality improvement	•key metrics: patient throughput, lead time to appointment, staff utilization, panel size per provider, no-show rates, **potential preventable complications and financial performance.**

Ambulatory Documentation Burden

Main Causes of Growth

- *"Physicians report 38% (or 518,000 hours per year) of their total administrative work is unnecessary.*
  - *24% is work that could be done by another health care profession, freeing up 327,000 physician hours annually or the equivalent of approximately **1.1 million patient visits.***
  - *14% could be eliminated entirely, freeing up 191,000 physician hours annually or the equivalent of approximately **637,000 patient visits**.*
  - *The top contributors to unnecessary burden are **medical forms, doctor's notes, shadow billing, business operations, billing, licensing and privileging.***
  - *The health system itself, including the complexity of the governing and oversight bodies, is also a contributor to physician administrative burden."*



(ORASE Report Nova Scotia 2020)

Full Capture of Ambulatory Documentation & Coding

AI-Powered Documentation Tools

AI clinical documentation tools use natural language processing, machine learning, and speech recognition to:

- **Automatically transcribe patient anamnesis & medical notes**
- **Suggest medical codes for billing**,
- **Identify gaps in documentation,**
- **Nudge the clinician to complete missing info**,
- **Structure data into clinical formats**, and
- **Seamlessly integrate with EHR systems**

These technologies can handle multi-language transcription, real-time note generation, translation, editing and coding.

Benefits include a **50% average reduction in charting time, a 30% reduction in documentation errors, and significant improvements in clinician work-life balance.**

"For every hour spent on patient interaction, the physician has an added one-to-two hours finishing the progress notes, ordering labs, prescribing medications, and reviewing results without extra compensation" (Wright, Katz – NEJM 2018)

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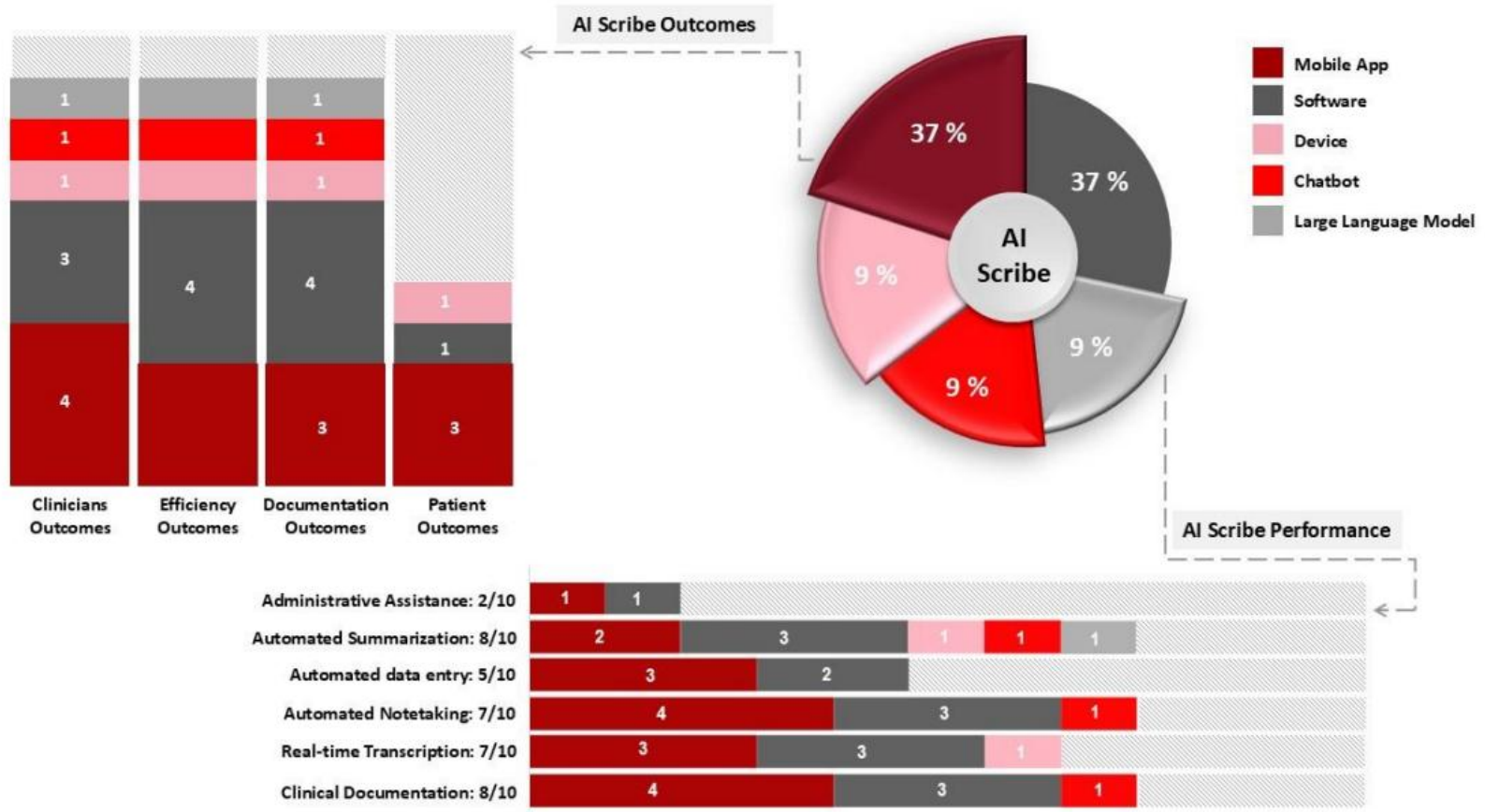
Impacts of AI Scribes on Clinical Outcomes, Efficiency, and Documentation

SPOR - Strategy for Patient-Oriented Research for Canada Health Infoway



- Reduced documentation burden
- Reduced cognitive load
- Substantial alleviation of cognitive strain
- Notable reduction in temporal demand
- Better management of time pressures
- Enhanced efficiency and task outcomes
- Positive trends in provider engagement and reduced stress
- Mixed impact on productivity

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SPOREA_AI_SCRIBE_FINAL_Report.pdf

Coding evolution

From coder-assisted to a fully autonomous experience

Coder-assisted
Document annotations
Clinically relevant phases

Coder validation
Auto-suggested codes
Expedited coder validated

Semi-autonomous
No coder touch for qualified codes
Auto-drop confident codes

Autonomous coding
No coder touch for qualified episodes
Final coded ready

Artificial intelligence (AI) powered by AWS

Expert systems	Natural language processing / Machine learning	Deep learning / Neural network models

1980's… 2000 2015 2020 2024 - 2025

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Overview of Solventum Ambulatory Solutions

- Solventum offers a comprehensive suite of ambulatory solutions designed to:
  - Improve care quality
  - Reduce complications
  - Optimize cost efficiency
- These solutions leverage decades of experience in classification systems, risk adjustment, and performance benchmarking.
- **Key Capabilities of Solventum Ambulatory Solutions:**
  - Patient-level case complexity analysis (CMI)
  - Risk-adjusted benchmarking and peer comparison
  - Ambulatory risk adjustment models
  - Tracking of 30-day post-discharge complications
  - Expenditure distribution analysis specific to each methodology
  - Identification of hot spots and cost containment opportunities

Understanding your ambulatory cohort case complexity (CMI)

- CMI enables smarter resource management, quality analysis and benchmarking and has an augmented importance as healthcare migrates increasingly to outpatient settings.

- Several elements drive and impact your ambulatory CMI:
  - Multiple chronic conditions and an aging population increase overall visit complexity.
  - Variability in the severity of illness and procedure/devices cost.
  - Inclusion of advanced or resource-intensive outpatient procedures.
  - Accurate, specific documentation & coding reflects true case complexity and ensures that the CMI correctly represents clinical realities.
  - Specialized facilities or high-acuity care naturally see higher CMI values.

- Tools should incorporate risk/complexity grouping across many procedures and many complication groups. These are used to stratify patients and procedures by severity and expected outcomes, enabling more accurate benchmarking between teams and resource allocation.

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Challenges of Outpatient Case Mix and Bundling

- **Readmission:**

  Providers generally respond positively by admitting more complex cases and increasing care intensity when payment models reflect patient complexity, but challenges include **potential hospital admissions** if facilities are unprepared for higher acuity or if incentives encourage shifting patients between care settings

- **Upcoding:**

  There is a need for careful design of case-mix scoring and reimbursement policies to avoid unintended consequences like **upcoding (inflating acuity scores) or inappropriate hospitalizations** that increase overall costs without improving quality

- **Patient Variability:**

  Bundling and casemix in outpatient settings can improve care coordination and cost efficiency, but it's complex due to **patient diversity and service variability**

Lessons learnt from Outpatient Case Mix and Bundling

Medicaid case-mix reimbursement systems:

Case-mix reimbursement systems aim to improve access to appropriate care by **adjusting payments** based on patient acuity or complexity, encouraging providers to admit and care for sicker or higher-needs patients while discouraging inappropriate admissions of low-acuity cases

Bundling payments (e.g., hospital or outpatient procedures) adjusted for case mix helps **align reimbursements with the expected cost** of care based on patient characteristics such as age, comorbidities, and severity of illness

Mississippi's Quality Incentive Payment Program (QIPP):

In Mississippi- Case-mix approaches led to **increased facility case-mix scores** (reflecting higher patient acuity) and higher direct care expenditures, **indicating improved access** for heavy-care patients and more resource allocation towards complex care needs

In outpatient settings under programs like QIPP, hospital performance and payment adjustments are **benchmarked against statewide baselines** and adjusted for case mix, age mix, and mental health burdens to fairly assess provider quality and efficiency

Benchmarking – how do I compare to my peers?

- **Core dimensions include:**
    1. **Access and efficiency metrics**
    2. **Quality indicators**
    3. **Equity & financial metrics**
    4. **Performance metrics**

- Comparing ambulatory facilities requires a **multidimensional analysis** of quantitative data, peer benchmarks, and patient-centered metrics.
- Using **comprehensive, risk-adjusted, and standardized indicators** is critical for fair comparisons and ongoing quality enhancement
- Solutions includes **risk-adjusted benchmarking** and actual vs. expected insights. This allows providers to compare performance fairly and identify areas for improvement

Common Metrics	Description
Case Mix Index (CMI)	Compares average patient complexity between facilities. (ambulatory DRGs, CRGs)
Quality Indicator Sets	Standardized sets (e.g. AHRQ PQIs, AQUIK…)
Patient Safety Indicators	Tracks (preventable) complications, adverse events, sentinel events.
Benchmarking Tools	E.g., CAHPS, EPA, QIPP, IQTiG, and local databases
Peer Comparison	Use of standardized audits, site visits, and peer reviews
Patient Scores	Standardized satisfaction and experience survey results (selected PROMs & PREMs)
Revenue per Visit	Tracks financial performance and guides pricing and service delivery strategies
Staff Utilization Rate	Enhances clinic profitability and operational efficiency by maximizing resource use

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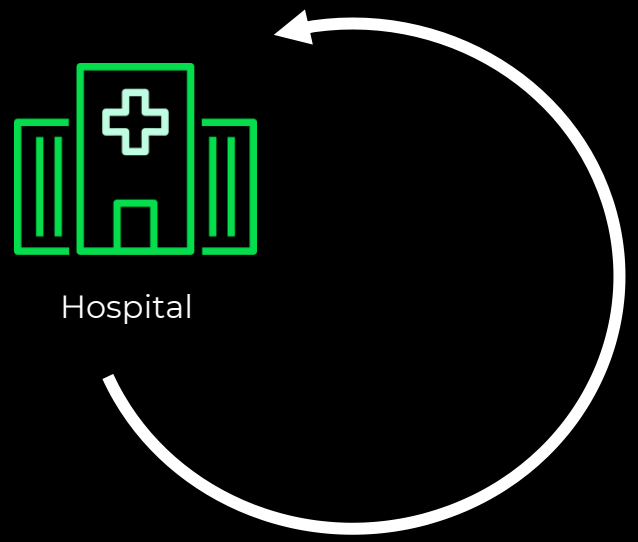
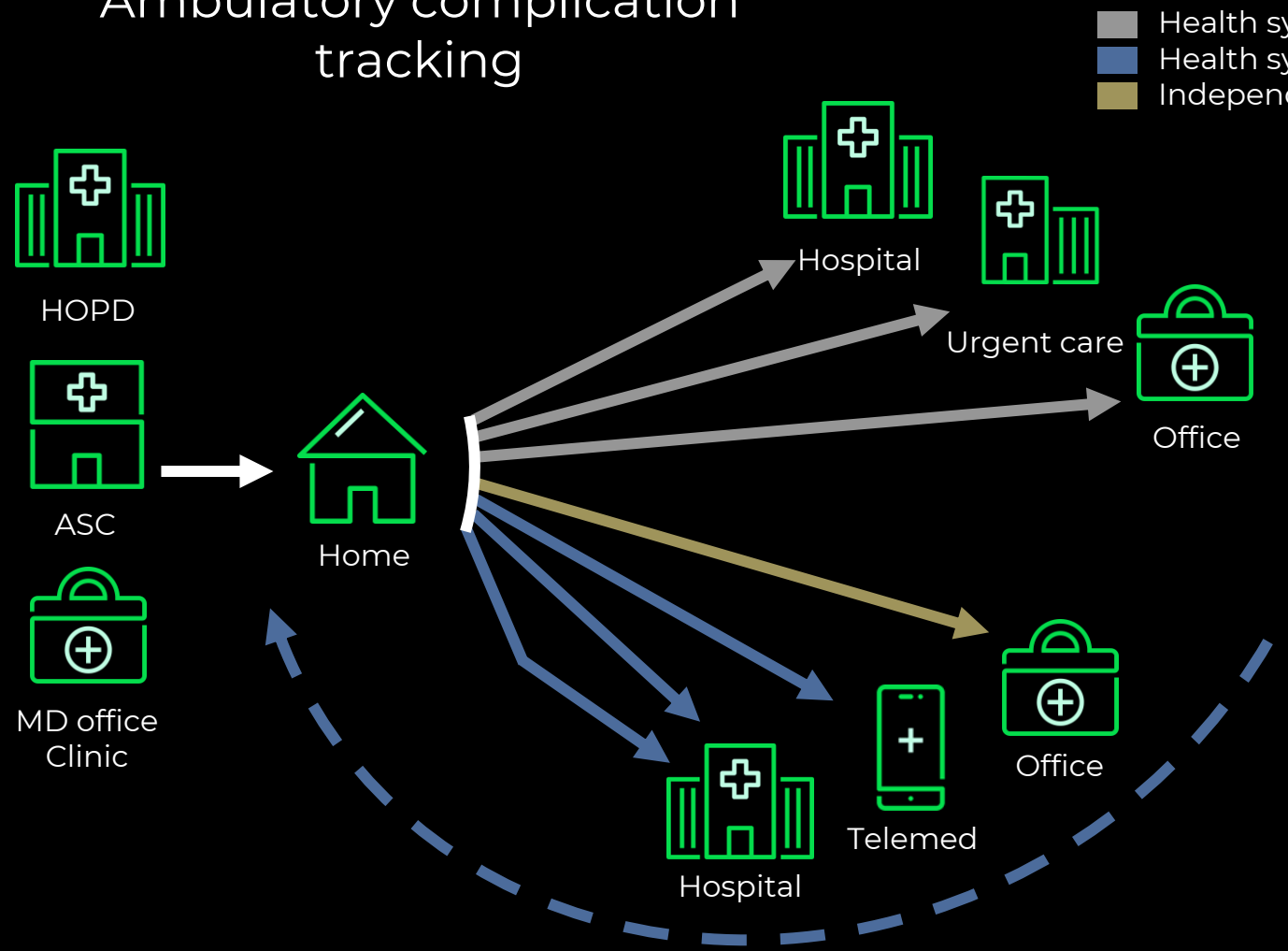
The Challenge of Tracking Ambulatory Safety

Inpatient complication tracking



Ambulatory complication tracking



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Essential elements of a bundling or casemix system

Requirement of Effective bundling and case-mix integration:

- Robust risk adjustment methods
- Incentives aligned with patient complexity
- Monitoring for quality and unintended behaviors like excessive hospitalizations
- Policies that support access to appropriate care for all patient acuity levels
- Early patient identification, interprofessional collaboration, and clear definitions are crucial for success

Other helpful practices

- Interprofessional Collaboration
- Population Characteristics and Complexity
- Cross-Continuum Care and Partnerships
- Clear Definitions and Risk Mitigation
- Data Sharing and Automation Needs
- Focus on Functional Outcomes

Risk Adjustment Methods

The most common risk-adjustment models including the ambulatory care (all-encounter models) are widely implemented for payment, resource planning, and quality comparison.

They are built on patient demographics and diagnosis data, with increasing integration of **pharmacy** and **utilization measures** to reflect true patient complexity and improve system equity and efficiency. Complete, clinically meaningful or interpretable risk adjustment methods also using pharmacy data include:

Method	Hierarchical vs. Regression Model	Risk Factors used	Development Objective	All-encounter Model	# Groups	Comorbidities included
CRG/CRxG	Hierarchical	Inpatient + outpatient diagnoses, Age, Gender, Procedures, Drug prescriptions	Development of risk-adjusted equalization payments, Monitoring	Yes	1081	CRGs are based on combination of diseases, Individual is assigned to one of 9 health states
RxGroups	Aggregate model (Regression)	Age, Gender, Drug prescriptions	Risk-adjusted reimbursement/compensation systems for Medicare, Risk assessment, Efficiency audit of care providers, Calculation of premiums	No	155 (aggregated to 17 ARCs)	Hierarchical, additive weights for drugs of different hierarchies
RxRisk	Aggregate model (Regression)	Age, Gender, Drug prescriptions for certain conditions	Risk assessment, Evaluation of severity	No	60	Additive weights for drugs of different categories
PCG+DCG	Outpatient and inpatient prescriptions	Age, Gender, Drug prescriptions, Diagnoses	Prediction of future health costs, Development of a comprehensive Rx classification	Yes	127 (current expansion: 118)	Diagnoses of diverse categories are taken into account

(Juhnke et al. 2016)

Solventum‘s Approach to Ambulatory Risk Adjustment

Risk adjustment is embedded in Solventum’s methodologies, includes concepts of DRG, SOI, ROM, VIL, procedure type, complexity and potentiallly preventable events models. These are used in large-scale deployments and support value-based care transitions internationally

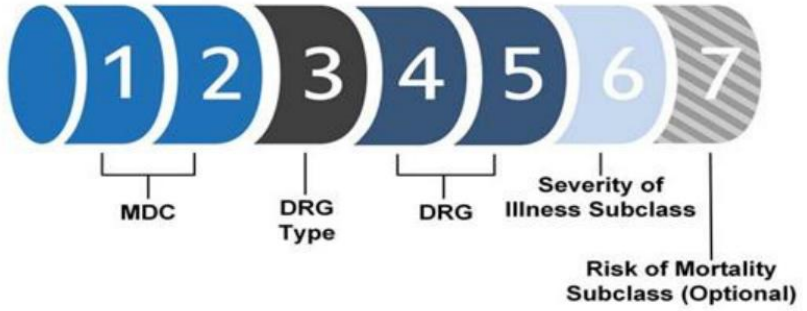
Methodology	Classification Focus	Basis for Risk Adjustment
EAPG (Enhanced Ambulatory Patient Groups)	Ambulatory/outpatient care	Administrative & clinical characteristics (age, gender, diagnosis, procedures, procedure type)
CRGs (Clinical Risk Groups)	Population-based, all care settings (inpatient, outpatient, pharmacy)	Longitudinal individual clinical history (demographic factors, care settings, acute & chronic conditions, severity of illness, service utilization, pharmaceutical usage)
IR-DRG (International Refined Diagnosis Related Groups)	Ambulatory/outpatient care	Ambulatory administrative & clinical characteristics (age, gender, diagnoses, procedures, comorbidities, procedure type & complexity), Visit Intensity Level (VIL) for ambulatory medical encounters

IR-DRG Structure

IR-DRG Type	Description
1	Inpatient Procedure IR-DRG
2	Ambulatory Major Procedure IR-DRG
3	Ambulatory Significant Procedure IR-DRG
4	Inpatient Medical IR-DRG
5	Ambulatory Medical IR-DRG
6	Inpatient Childbirth IR-DRG
7	Ambulatory Childbirth IR-DRG
8	Inpatient Newborn IR-DRG
9	Ambulatory Newborn IR-DRG
0	Error IR-DRG

How to read the IR-DRG number

Each IR-DRG is numbered using a six digit number (seven digits, if the RoM option is turned on) as shown in the following figure.



SOI/ROM values	Description
1	Minor
2	Moderate
3	Major

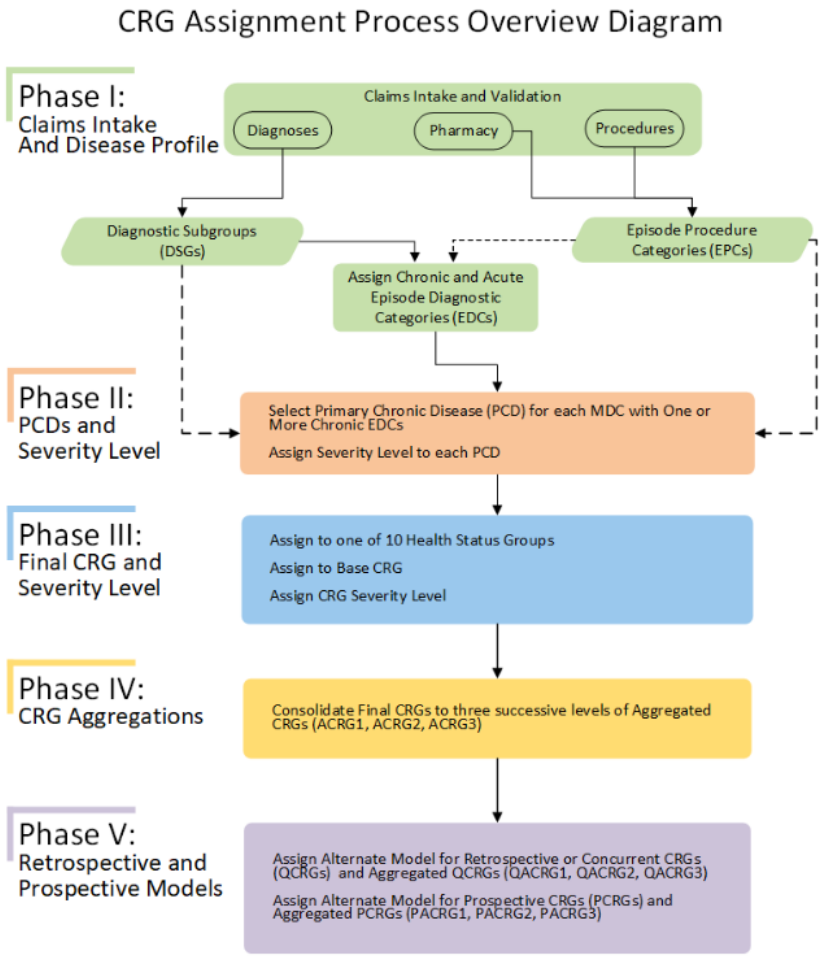
Procedure Class	Name	Example
A	Inpatient only	Coronary bypass
B	Inpatient or Ambulatory	Carpal tunnel release
C	Significant ambulatory	GI endoscopy
D	Ambulatory mental health	Group therapy
E	Ambulatory minor ancillary	ECG
F	Ambulatory visit intensity	Comprehensive consultation
G	Incidental procedure	Venipuncture

DRG Count

DRG Type	Base	Inpatient (w/ SOI)	Ambulatory (wo/ VIL)
Procedure	108	324	250
Medical	156	468	51
Total IR-DRG		1.093	

Clinical Risk Groups

Assignment Logic



- **Phase I.** Claims and encounter information are validated for use, a disease profile and history of past medical interventions are created.
- **Phase II.** Most significant primary chronic disease and its severity of illness level is identified.
- **Phase III.** Health Status Group, base CRG category and severity level are assigned. Absent chronic disease, assignment is due to the presence of one or more significant acute illnesses.
- **Phase IV.** The initial CRGs are consolidated into three successive tiers of aggregation, referred to as Aggregated CRGs or ACRGs.
- **Phase V.** Final CRG assignments are made for prospective or concurrent/retrospective applications. The final assignments take into account additional information, and in particular for the Concurrent CRGs, the presence of significant health events such as pregnancy, delivery, and newborn births.

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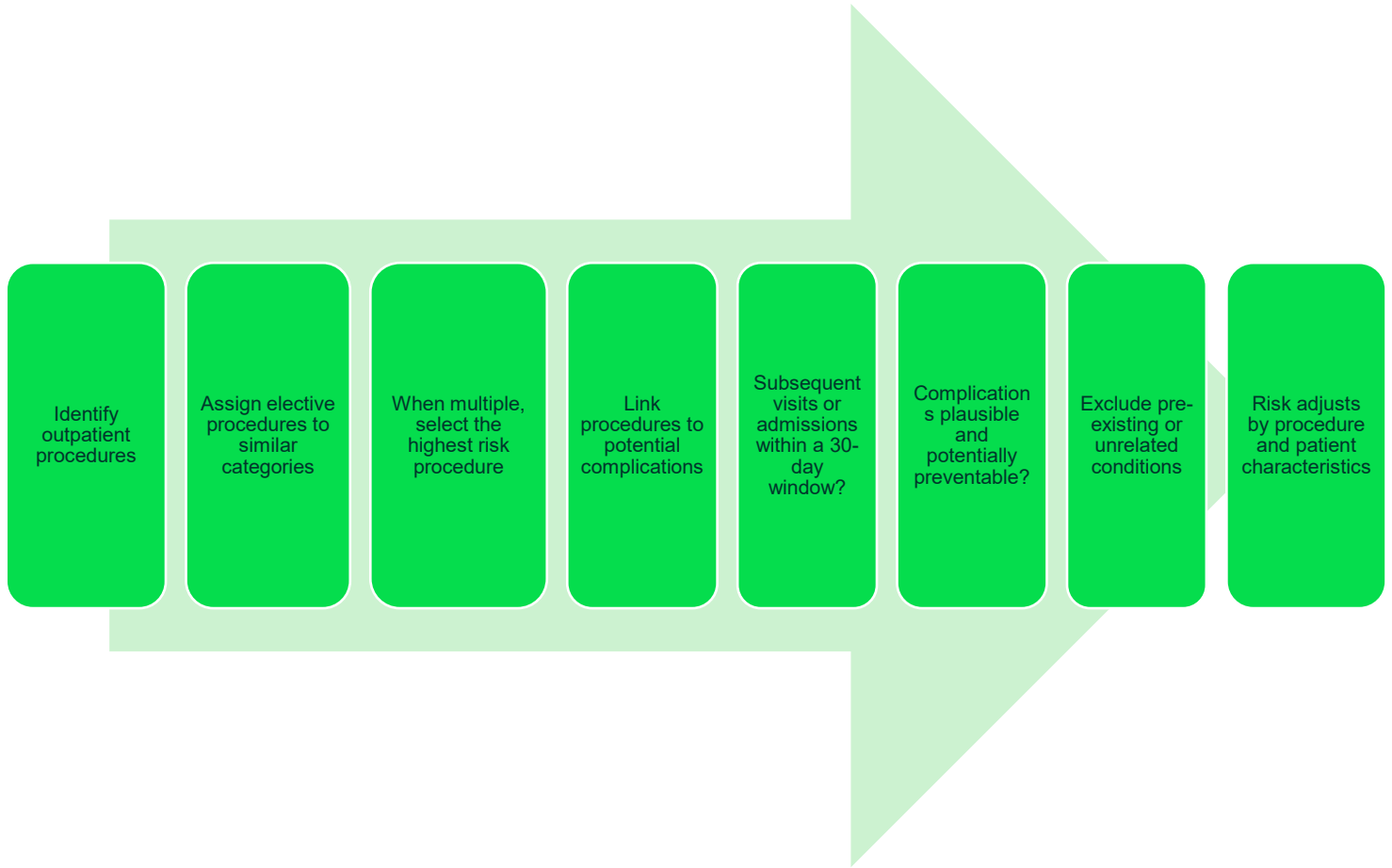
Complications plausibly related to procedures/potentially preventable

- *“Unlike the inpatient setting, the outpatient environment has a less mature patient safety measurement system. As the scope, volume, and complexity of procedures conducted in ambulatory settings expand, the need for a comprehensive approach to identify and trend adverse events also increases.”[1]*
- Providers and payers need to:
  - identify and aggregate complications in outpatient settings by specific procedures, service lines, providers, and facilities,
  - compare to national benchmarks
  - drill-down data analysis to provide insights on patient safety areas with the greatest opportunities for quality and excess cost improvements in outpatient settings.



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[1] News and views. Int Wound J. 2022 Dec 28;20(1):6–7. doi: 10.1111/iwj.14068. PMCID: PMC9797915.

AM-PPC Rates

Elective procedure focus:
Less procedure complexity with care team informed by knowledge of chronic conditions

Procedure and complication relationship focus:
Focus on clinical relationship between procedure & complication also limits effect of chronic conditions

Procedure-Specific Adjustment:
The assignment of Procedure Subgroups (PSGs) is the basis of evaluation since these group procedures by provider specialty and clinical complexity, shared relative risk of interventions, while also considering anatomical distinctions.

→ **Adjustments are made for certain Oncology related (PSG) procedure encounters shown to exhibit variation.**

→ **Payer Type & Age are used for additional risk adjustment to account for Chronic conditions, SES, frailty, disability & ability to self manage**

General Surgery: Abdominal Surgery Example						Medicare - Age Adjusted Rates			
PSG	PSG Description	Sub Service Line Description	At Risk	PPC Count	Rate	Under 65	65_74	75_84	85 and Over
42	Laparoscopic Cholecystectomy	Abdominal Surgery	101,134	4,456	4.41%	6.30%	3.60%	4.87%	5.89%
45	Ventral Hernia Repair	Abdominal Surgery	46,599	1,271	2.73%	3.90%	2.23%	3.01%	3.65%
46	Complicated Ventral Hernia Repair	Abdominal Surgery	52,638	1,890	3.59%	5.14%	2.93%	3.97%	4.80%
48	Inguinal and Hydrocele Hernia Repair	Abdominal Surgery	175,094	4,208	2.40%	3.44%	1.96%	2.65%	3.21%

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(Fuller et al. 2025)

Solventum's approach to 30 day events-Post discharge

- Visibility into Potentially Preventable Ambulatory Procedure Complications

Post-Procedure Tracking

Links inpatient admissions, emergency room and other outpatient visits back to originating procedure

Preventable Procedure Complication Detection

Classifies procedures and complications that may have been avoided with improved care processes

Risk Adjustment & Benchmarking

Considers factors such as age-frailty, comorbidity-cancer, and uses payer for insights on socioeconomic status

A/E Comparisons Used to Identity Care Variation

Compare providers using actual to expected outcomes to identify variations in procedure outcomes

30-day event rates - post discharge complications

- Solventum categorizes complications into four distinct settings:
- Type 1: Emergency Department (ED) visits
- Type 2: Inpatient admissions
- Type 3: Outpatient visits
- Type 4: Inpatient claims containing an ambulatory procedure within the 72-hour rule

Examples of Tracked Complications

- Sepsis
- Urinary tract infections (UTI)
- Bleeding
- Wound dehiscence
- Surgical site infections

- Solventum applies **risk/complexity grouping** to ensure fair comparisons across providers and procedures.
- This includes:
  - Stratification by procedure complexity
  - Benchmarking using **Actual/Expected (A/E) ratios**
  - Identification of “at-risk” volumes and low-performing hospitals

Uses:

- Quantify unplanned ED and inpatient volume post-procedure
- Identify cases for chart review and clinical investigation
- Support CDI, HIM, and patient safety teams in improving documentation and care quality

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Medicare National data from 2021-2023

Financial Impacts of Potentially Preventable Complications

Primary Drivers of Cost can be due to:

i. Procedures with high complication risk

ii. Procedure that have high volume

Service Line	Procedure Volume	IP+ED Complications	Estimated Cost	% Total Cost
Interventional Radiology	887,247	65,705	$818,077,663	17%
Gastroenterology	4,867,595	77,087	$793,543,593	16%
Urology	1,764,719	94,797	$621,825,395	13%
Orthopedic Surgery	2,239,976	64,988	$546,716,221	11%
Cardiology	1,584,005	34,849	$441,098,810	9%
Vascular Surgery	393,562	25,205	$323,057,677	7%
General Surgery	1,575,814	38,839	$316,568,391	7%
Pain Management	2,213,294	26,002	$259,209,951	5%
General Orthopedics	2,180,255	20,138	$211,639,897	4%
Pulmonology	225,703	9,722	$135,513,390	3%
Ear, Nose and Throat Surgery	690,612	10,984	$121,618,689	3%
Spine Surgery	341,509	11,929	$98,690,757	2%
Ophthalmology Surgery	1,235,084	7,960	$92,843,054	2%
Gynecological Surgery	207,371	6,815	$38,220,322	1%
Neurological Surgery	136,608	2,716	$ 22,659,382	0%
Gynecology	97,542	1,171	$8,079,078	0%
Cardiothoracic Surgery	6,014	287	$3,529,906	0%
Total	**20,646,910**	**499,194**	**$4,852,892,175**	100%

Top 5: 66%

- **High-Risk**
- High-Volume
- **High-Risk**
- High-Volume
- High-Volume

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Analysis of ambulatory expenditure distribution

- Service line distribution of hospital outpatient spend for Medicare FFS (facility only).

Top 5 spend buckets (51.8%)

Sr. No	Service line	Percentage share
1	Chemotherapy and Pharmacotherapy	21.60%
2	Orthopedic Surgery	9.62%
3	Diagnostic Radiology	7.43%
4	General Medicine	7.06%
5	General Surgery	6.12%

Data OPPS (Outpatient Prospective Payment System) CY2023

- Need of a spending rational –Where is the money spent-which services (paying for equitable levels of service provision):Poly-pharmacotherapies could be a potential waste
- Inefficiency and unevenness in the different service provision including wait times can be analyzed
- Variation in patient outcomes can be better understood (More spending does not always means better outcomes)

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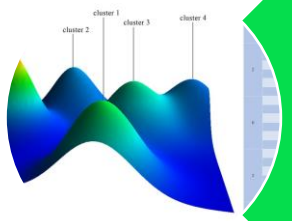
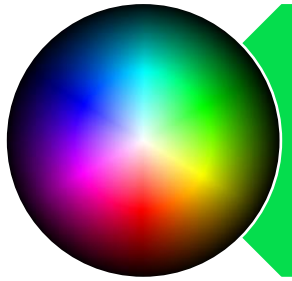
Ambulatory case studies: surgical



Hot spots and areas of focus

- Operating Room (OR) Turnaround Times
- Surgical Supply & Instrument Management
- Staff Training, Team Communication
- **Documentation/Coding** compliance & Protocol Adherence
- Equipment Utilization & Ergonomics



Spectrum of interventions

- Checklists and standard pathways for patient prep, anesthesia, and post-op care
- Workflow map, identify bottlenecks, and implement changes (e.g., parallel processing of patient prep and room cleaning)
- Digital surgery checklists, teamwork dashboards, or scheduling software, **documentation templates**.

Areas of cost savings/containment.

- Centralized inventory and reduced redundant/expired stock
- Faster OR turnover and fewer delays mean fewer overtime payments
- Protocols and compliance improvements lead to fewer readmissions and complications, reducing complication-related costs.
- **Leverage autonomous coding tools (see next slide)**

"The most impactful system-based interventions included:

- **standardization**, which improved technical and NTS, patient outcomes, and **professional development**
- **environment redesign** interventions that improved culture;
- **cognitive aid interventions** that improved NTS, and compliance and protocol quality;
- **equipment and technology interventions** that boosted compliance and protocol quality, and
- **ergonomics**, with technology also enhancing technical skills and resilience." *(Armstrong et al. 2025)*

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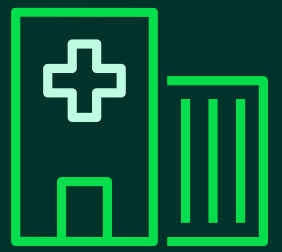
Coding automation ROI

Outpatient surgical facility automation rate



Service line	Annual volume	6-month automation*	CPH	Coder equivalent
Same Day Surgery	92,489	60%	23	1.9
Emergency Department	244,332	60%	27	4.5
OP Cardiology (simple & complex)	15,061	60%	27	0.4
Diagnostic Radiology	172,747	90%	27	2.4
				Total: 9.2

Potential cost savings: $607K a year**

*Estimated automation rate based on customer data evaluation.
**Average annual coder salary is $66K a year. Source, AAPC.
CPH = Charts per hour

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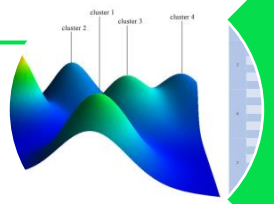
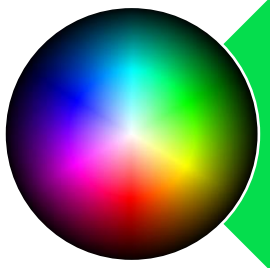
Ambulatory case studies: medical



Hot spots and areas of focus

- Delays in registration, triage, and rooming.
- Gaps in follow-up and monitoring for patients with chronic conditions
- Errors or inefficiencies in prescription handling.
- **Excessive time spent by providers on EHR data entry and administrative tasks**.
- Delays in ordering, processing, or reporting results.



Spectrum of interventions

- Streamline patient flow from check-in to discharge; implement parallel processing (e.g., labs and vitals taken simultaneously).
- Use of electronic health record (EHR) templates, voice recognition, and automated reminders for appointments and preventive care.
- Coordinate chronic disease management and improve transitions of care.
- Direct electronic ordering, with auto-notification of results to care teams and patients.
- Pharmacist-led interventions for high-risk medication users.

Areas of cost savings/containment.

- Streamlined workflows allow more patients to be seen with the same or fewer staff hours.
- Better documentation and care coordination reduce duplication.
- Improved chronic care and medication management prevent hospitalizations and emergency visits.
- Lean approaches minimize over-ordering and wasted pharmaceuticals/lab reagents.
- **More accurate, timely documentation and coding capture appropriate billing with autonomous coding (see next slide)**

Entitlement: "A large outpatient clinic implements EHR-based alerts for needed patient follow-ups and automates lab result notification to both patients and physicians. By redesigning the rooming process and using scribes, speech-to-text tools and AI coding, clinicians spend less time on documentation and see more patients per day. Nurse care managers address high-risk chronic care patients, reducing total hospital days and emergency visits. The clinic sees increased productivity, lower costs, and sustained improvements in patient care quality"

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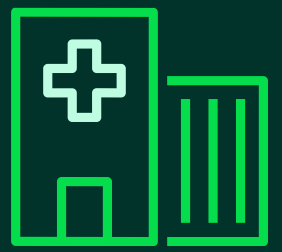
Coding automation ROI

Outpatient medical facility automation rate



Service line	Est. annual volume	Automation rate	Industry avg. CPH	Coder equivalent
Radiology	102,059	91.3%	20	2.2
Lab/Pathology	38,316	64.6%	20	0.60
Cardiology	11,033	60.1%	20	0.16
				Total: 3

Estimated cost savings: $175K a year*

Estimated annual volume based on 3-month sample data, customer provided
Customer automation rate data from April – June 2025
*Average coder salary = ~$66,000 a year, Source, AAPC
CPH = Charts per hour. Industry average.

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Workshop 7

- Discussion to the Workshop attendees – to share and discuss.

The Future - New Outpatient healthcare models

- Social Prescribing – *what is it ? Does it work?*
- Home Delivery of care – *If it's about the patient, then… (but what about cost?)*
- Digital health/ Telehealth - *Advantages, Disadvantages*
- Artificial Intelligence(AI)– '*The future doesn't need humans' or ????*

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Mentimeter

Your opinion

This workshop just stated the obvious, nothing new!

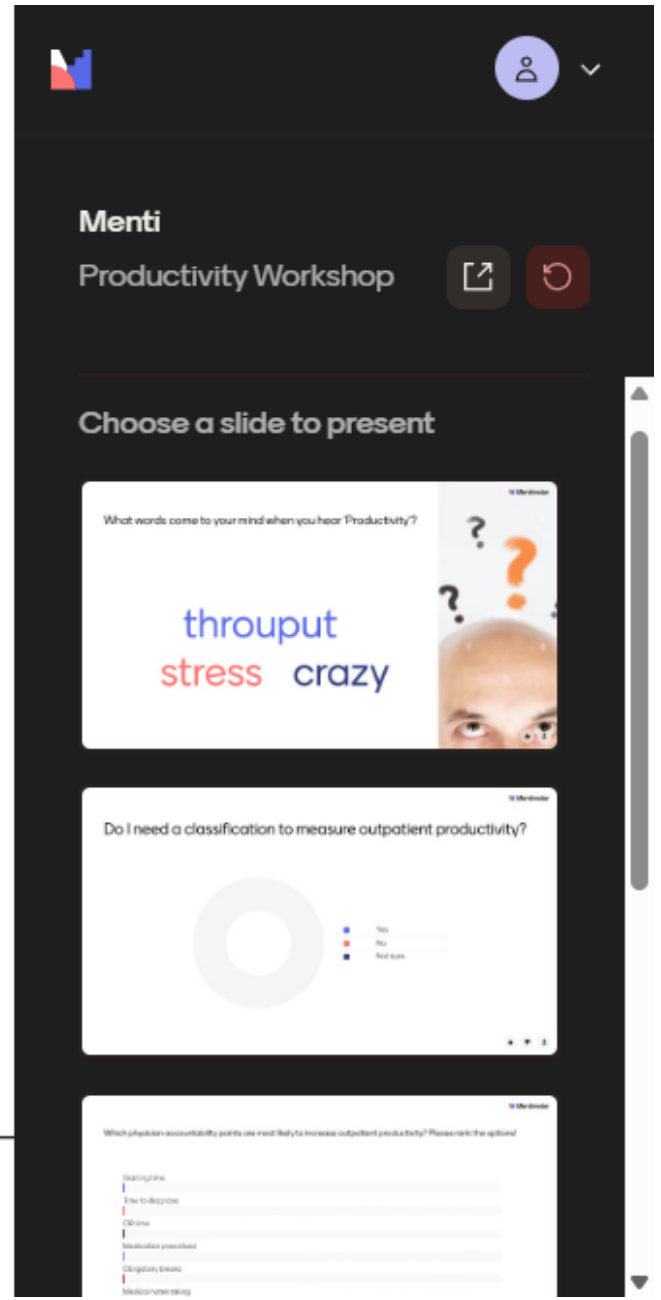
I've heard some new ideas, I will follow-up with these!

Definitely changed my way of looking at productivity!

Strongly disagree

Strongly agree

0 / 1



Workshop 7 - Contacts

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Merci!

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Measuring Resource Consumption & Revenue

Costs

- **Classification systems** such as EAPGs or ACGs assign encounters to specific groups based on clinical similarity, resource use, or service type for systematic tracking of the resources used (e.g. staff time, procedures, diagnostics, and overhead).
- **Average Costs are** calculated for each class, factoring in direct and indirect expenses. For instance, time spent with patients, consumables, diagnostic activities, and facility overhead can all be assessed per encounter class
- **Cost variation drivers are identified (e.g.** outpatient clinic specialty, procedure costs) and outlier costs and process inefficiencies are addressed.

Prices

- **Payment and pricing models** (e.g. OPPS) use encounter classification to define fixed payment rates for groups of similar encounters rather than for each service individually.
- **Risk Balancing** ensures fairness in payment rates: outpatient clinics are paid a set amount per classified encounter (rather than “cost plus”) taking on financial risk for efficiency—benefitting if costs are less than payments, and absorbing losses otherwise.
- Standardized coding practices leads to **coding compliance** against the encounter classification with supporting documentation, reduces upcoding incentives, and ensures payment accuracy for services rendered.

Measuring AI Coding Accuracy (I)

Exact Match Ratio (EMR)

- percentage of patient cases (episodes) where the set of codes assigned by a coder (human or AI) exactly matches the reference or gold-standard set for that instance.
- a very strict metric; even a single missing or incorrect code means the case is not counted as correct.
- If the assigned set of ICD or procedure codes for an outpatient episode matches the standard set without any discrepancies, that counts as an exact match. EMR represents the proportion of such perfect matches across all tested cases.
- **Significance**: in clinical and reimbursement contexts, any error could trigger a full audit or financial penalty.

Jaccard Score (Index)

- similarity between the set of codes assigned by a coder and the reference set, calculated as the size of the intersection divided by the size of the union of the two sets:
- $Jaccard = \frac{|A \cap B|}{|A \cup B|}$ *A* is the set of assigned codes and *B* is the gold-standard set.
- allows for partial matches—overlapping codes between the two sets increase the score even if the sets are not identical.
- capturing the degree of code overlap per outpatient episode, reflecting realistic situations where most, but not all, codes are matched correctly.
- **Significance**: multi-label coding tasks for nuanced assessment of coder (human or AI) performance in “almost correct” scenarios and facilitating comparison between coders or systems

Measuring AI Coding Accuracy (II)

AUC-ROC

- Measures a model's ability to distinguish between classes (e.g., whether a given code should or should not be assigned). For each code class, it plots the true positive rate versus false positive rate at various thresholds.

- **Significance**: The area under this curve (AUC) reflects how well predictions separate true codes from non-codes, regardless of the probability threshold.

AUC-PR

- Captures the trade-off between **precision** (positive predictive value) and **recall** (sensitivity) for each code class, summarized as the area under the precision-recall curve. It is particularly useful for clinical coding, where positive cases (correct codes) are typically much rarer than negatives (codes not assigned)

- **Significance**: High AUC-PR suggests that most assigned codes are both accurate and comprehensive across threshold

Human Brain Bandwidth

Human behaviors, including motor function, perception, and cognition, operate at a **speed limit of 10 bit/s**

- “Human thinking can be seen as a form of navigation through a space of abstract concepts," (Zheng and Meister – 2024)
- Our sensory system gathers data at ~ $1Gbs = 10^9\ bps$
- The information throughput of a human being is ~ 10 bps (for conscious thought and behavioral output = “one thought thread at a time”, e.g.)
- *“For the audience to comfortably follow an instructional presentation in English, the recommended narration rate is 160 words/min. That is, indeed, slightly higher than the 120 words/min typing rate, yielding an information rate of 13 bits/s.”*

- => Illusory “multitasking features” attributed to the human brain.

- E.g. chess players can only concentrate at one possible scenario at a time (5-10 secs)
- Why would the healthcare provider brain be any different?

The information rate of human behaviors (Zheng et al. 2024)

Behavior/activity	Time scale	Information rate (bits/s)	References
Binary digit memorization	5 min	4,9	International Association of Memory
Blindfolded speedcubing	12.78 s	11,8	Guinness World Records Limited
Choice-reaction experiment	min	~5	Hick, Hyman, Klemmer and Muller
Listening comprehension (English)	min–h	~13	Williams
Object recognition	0.5 s	30–50	Sziklai
Optimal performance in laboratory motor tasks	~15 s	10–12	Fitts and Fitts and Peterson
Reading (English)	min	28–45	Rayner
Speech in 17 languages	< 1 min	39	Coupe´ et al.
Speed card	12.74 s	17,7	International Association of Memory
StarCraft (e-athlete)	min	10	Guinness World Records Limited
Tetris	min	~7	Tetra Channel
Typing (English)	min–h	10	Dhakal et al. and Shannon

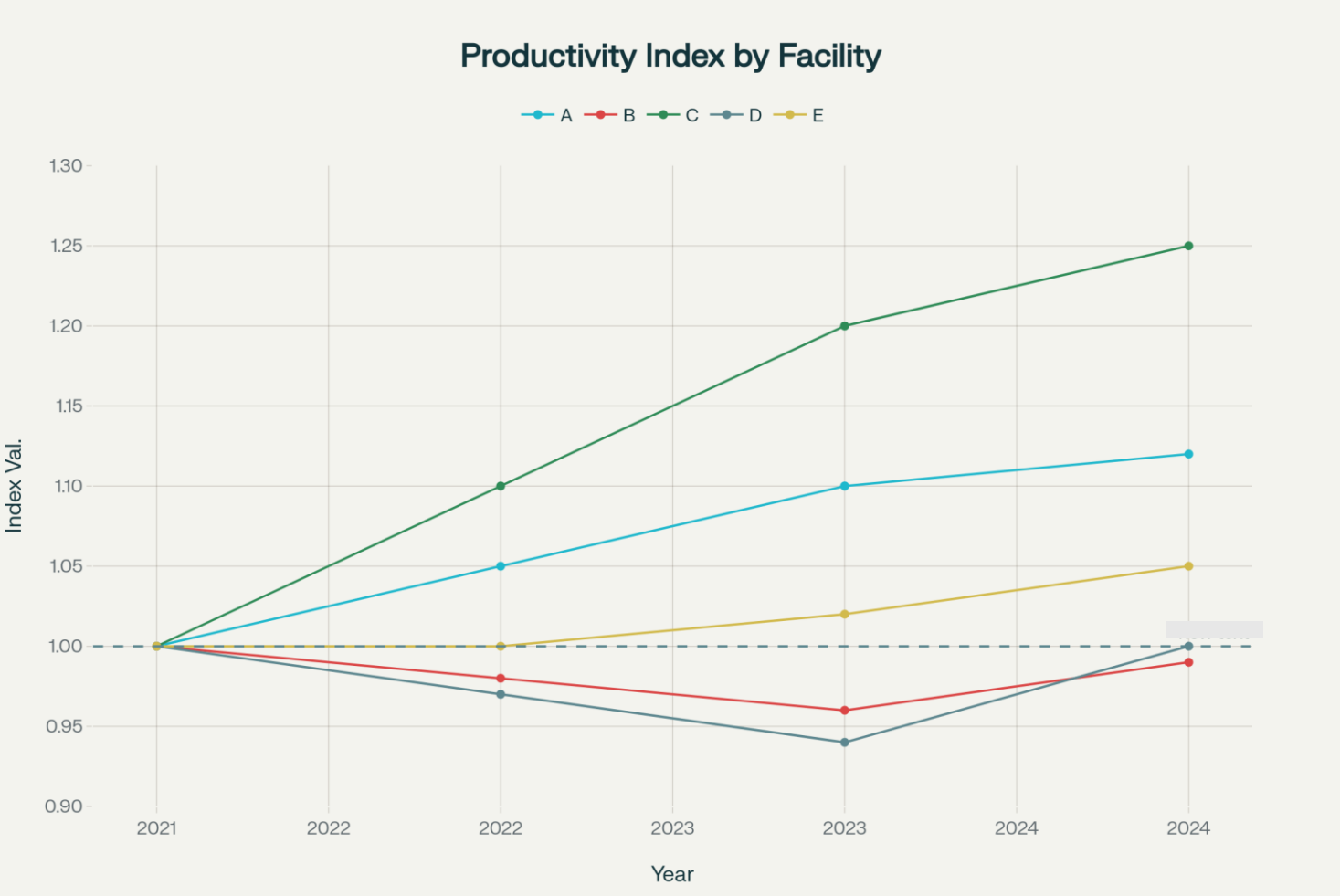
Malmquist Productivity Index (MPI)

Measuring Efficiency & Technology Change

- Calculates productivity change between two periods by comparing how efficiently **resources** (inputs like staff, equipment, and costs) **are converted into outputs** (such as patient visits, procedures, and outcomes).
- Based on distance functions and data envelopment analysis (DEA), which use observed data to construct a “frontier” of best practice. Each provider’s performance is measured relative to this efficiency frontier.

- Components:
  - **Efficiency change** (catch-up): Whether a provider gets closer to or farther from the "best practice frontier" over time (i.e., operations become more or less efficient compared to peers).
  - **Technological change** (frontier shift): Whether the “best practice” itself improves or regresses, for example, due to innovation, new techniques, or system-level changes.

Generic Malmquist Productivity Index Trend by Facility



Interpretation:

>1 indicates productivity improvement.

<1 indicates a productivity decline.

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Data Envelopment Analysis (DEA)

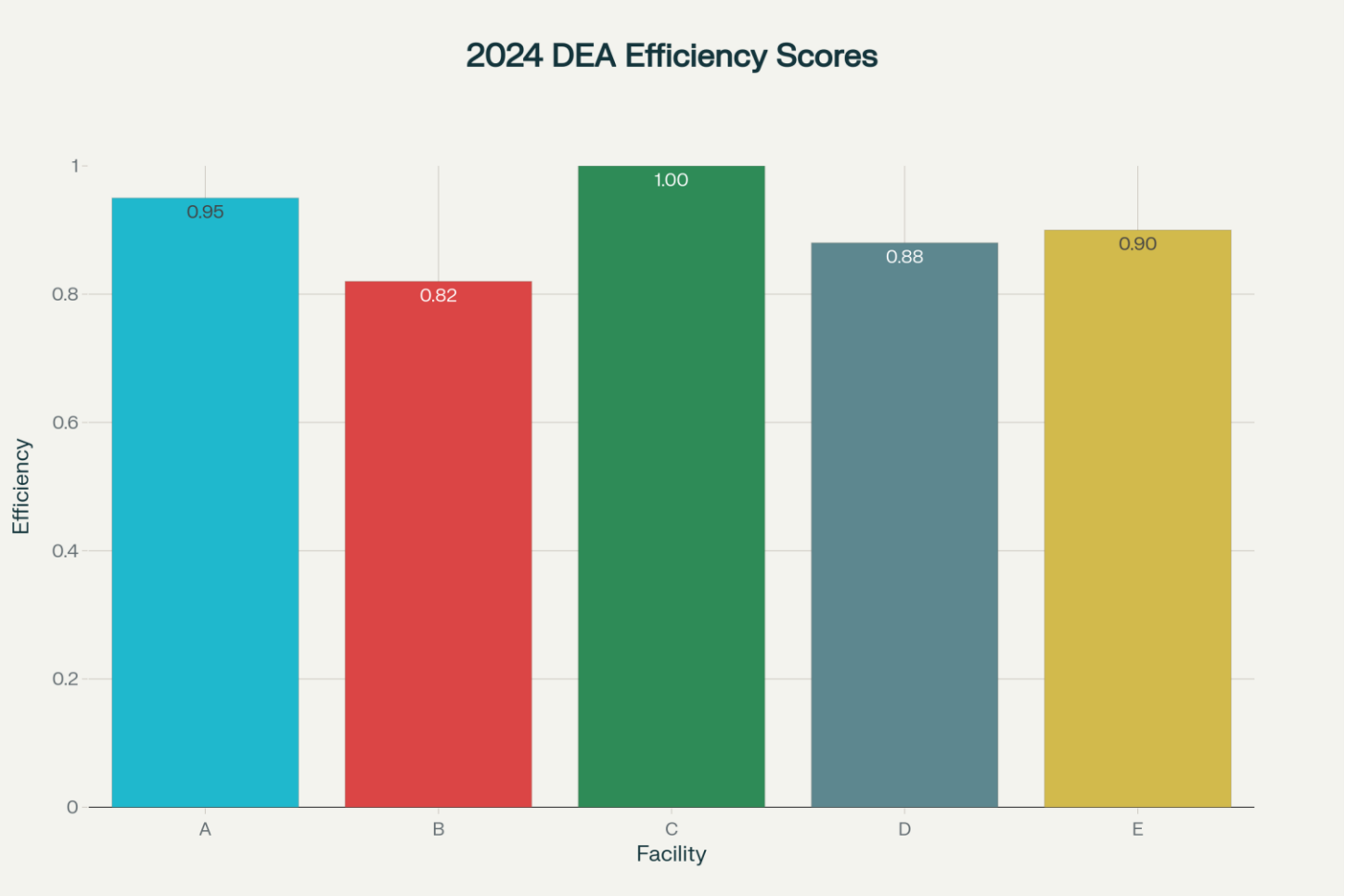
Technical & Allocative Efficiency

- 1. Define **Decision-Making Units** (DMUs)
  - Each outpatient clinic, department, or even annual performance for a single clinic acts as a DMU to be evaluated against peers.
- 2. Select **Inputs and Outputs**
  - Inputs: Resources used (e.g., number of nurses, physicians, pharmacists, beds, operating hours, total costs).
  - Outputs: Services delivered and/or outcomes achieved (e.g., number of outpatient visits, procedures, quality indicators, patient satisfaction).
- 3. Choose **Model Orientation**
  - *Input-oriented:* Minimizes inputs needed for a given output level. Preferred when managers can control resources but not demand.
  - *Output-oriented:* Maximizes outputs achieved with given resources; useful if increasing services is the goal.

- **Returns to Scale**:
  - *CCR model (Constant Returns to Scale):* Assumes all DMUs operate at optimal scale.
  - *BCC model (Variable Returns to Scale):* Allows for different operational scales (especially important for diverse outpatient settings).
- Most healthcare DEA studies use the BCC (VRS) model due to varying clinic sizes and capacities.

- Interpretation:
  - *Efficient DMUs* (score = 1): Benchmarks for others.
  - *Inefficient DMUs* (score < 1): Have excess inputs or insufficient outputs; DEA can recommend target reductions (in inputs) or increases (in outputs) to achieve efficiency.

Generic Yearly DEA Efficiency Index by Facility



Interpretation:

Efficiency Scores for Outpatient Facilities in 2024 (1=Fully Efficient - **Benchmark**)