OPAT in Ireland – Past, present & future

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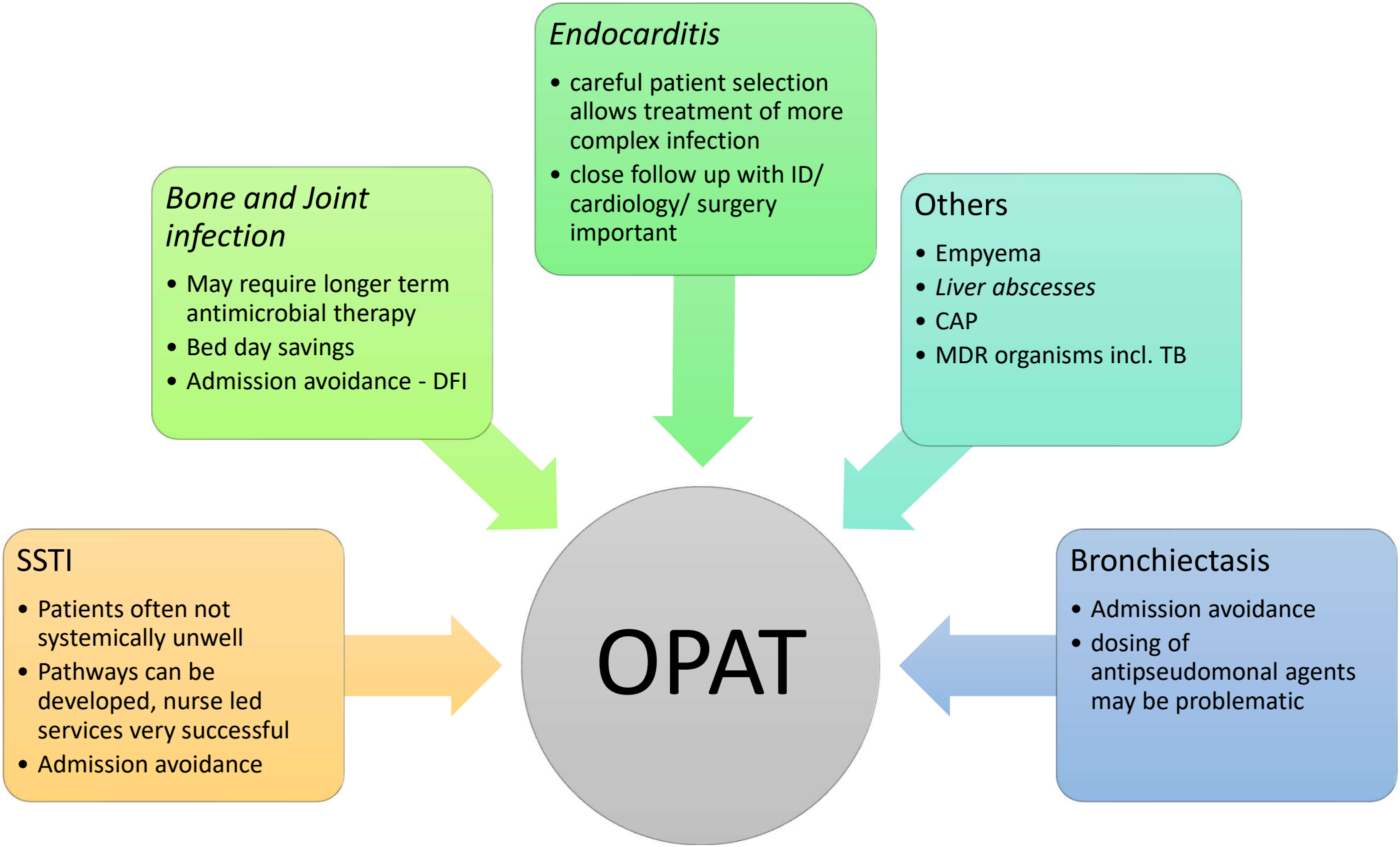
Outpatient Parenteral Antimicrobial Therapy

- Outpatient parenteral antibiotic therapy (OPAT) first described in 1974

- It is estimated that 35% of all hospitalised inpatients receive IV antibiotics.
  - OPAT can dramatically reduce costs of patient care by up to 70%

- Infections commonly treated with OPAT may require weeks of antibiotic therapy
  - OPAT facilitates return to normal life
    - Improves psychological and physical recovery
  - Avoidance of healthcare associated infection


Endocarditis
• careful patient selection allows treatment of more complex infection
• close follow up with ID/ cardiology/ surgery important
Bone and Joint infection
• May require longer term antimicrobial therapy
• Bed day savings
• Admission avoidance - DFI
Others
• Empyema
• *Liver abscesses*
• CAP
• MDR organisms incl. TB
SSTI
• Patients often not systemically unwell
• Pathways can be developed, nurse led services very successful
• Admission avoidance
OPAT
Bronchiectasis
• Admission avoidance
• dosing of antipseudomonal agents may be problematic

Why do you need an OPAT service?

Survey Response	OPAT program present	No OPAT program Present	p value (χ^2)
ID practice **Adult ID** **Pediatric ID**	 142 27	 101 32	 0.006 0.09
Location of ID practice **Urban** **Suburban** **Rural**	 89 55 8	 77 30 15	 0.028
Type of Institution **Teaching Hospital**	 82	 78	 0.096
ID consultation **Mandatory ID consultation prior to OPAT discharge**	 74	 36	 0.002
Level of Participation **Frequent** **Occasional**	 137 15	 97 25	 0.013
Systematic methods of follow up **Laboratory result tracking** **Patient follow up**	 84 116	 31 50	 <0.001 <0.001
Mean number of complications witnessed in last month (range 0-8)	3.22 (SD 1.9)	3.21 (SD 1.9)	0.963[€]

Muldoon EG, et al. Infect Dis (Lond). 2015 Jan;47(1):39-45.

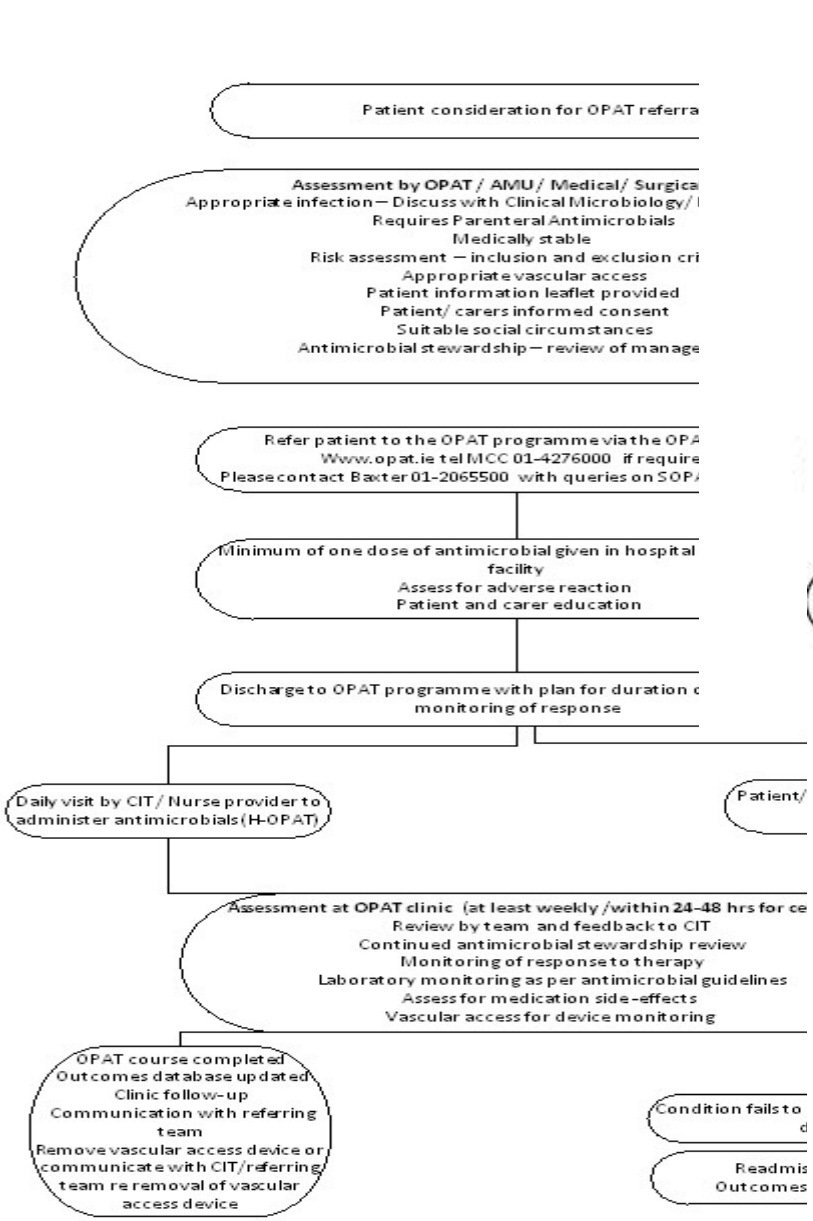
Where we've been…

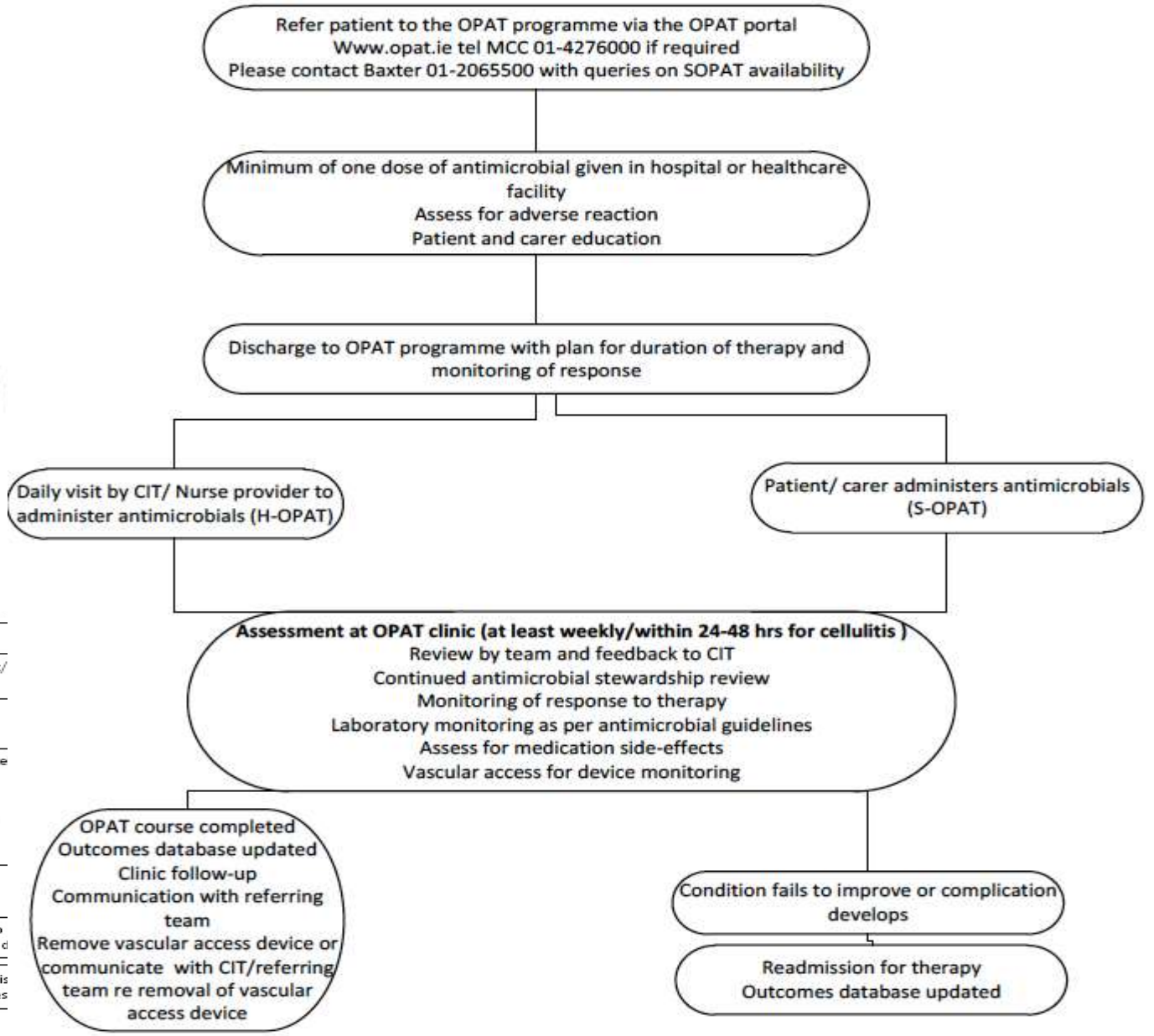
- In 2012 surveyed physicians through RCPI
- 47% respondents did not have a designated OPAT service available to them
- Great variation in monitoring and follow up
- 63% reported difficulty obtaining funding for antimicrobials
- SSTI, OM, pneumonia were the most commonly reported indications for OPAT

Muldoon EG, et al. Eur J Clin Microbiol Infect Dis. 2013 Nov;32(11):1465-70.

National OPAT programme

- In 2011, the Infectious Diseases Society of Ireland (IDSI) developed national OPAT guidelines and advocated successfully to the HSE for the establishment of a national OPAT programme
- Aim to ensure the safe, appropriate, and cost-effective use of OPAT


Patient consideration for OPAT referra
Assessment by OPAT / AMU / Medical/ Surgica
Appropriate infection – Discuss with Clinical Microbiology/
Requires Parenteral Antimicrobials
Medically stable
Risk assessment – inclusion and exclusion cri
Appropriate vascular access
Patient information leaflet provided
Patient/ carers informed consent
Suitable social circumstances
Antimicrobial stewardship – review of manage
Refer patient to the OPAT programme via the OPA
Www.opat.ie tel MCC 01-4276000 if require
Please contact Baxter 01-2065500 with queries on SOPA
Minimum of one dose of antimicrobial given in hospital
facility
Assess for adverse reaction
Patient and carer education
Discharge to OPAT programme with plan for duration
monitoring of response
Daily visit by CIT/ Nurse provider to
administer antimicrobials (H-OPAT)
Patient/
Assessment at OPAT clinic (at least weekly /within 24-48 hrs for ce
Review by team and feedback to CIT
Continued antimicrobial stewardship review
Monitoring of response to therapy
Laboratory monitoring as per antimicrobial guidelines
Assess for medication side-effects
Vascular access for device monitoring
OPAT course completed
Outcomes database updated
Clinic follow-up
Communication with referring
team
Remove vascular access device or
communicate with CIT/referring
team re removal of vascular
access device
Condition fails to
Readmis
Outcomes


Refer patient to the OPAT programme via the OPAT portal
Www.opat.ie tel MCC 01-4276000 if required
Please contact Baxter 01-2065500 with queries on SOPAT availability
Minimum of one dose of antimicrobial given in hospital or healthcare facility
Assess for adverse reaction
Patient and carer education
Discharge to OPAT programme with plan for duration of therapy and monitoring of response
Daily visit by CIT/ Nurse provider to administer antimicrobials (H-OPAT)
Patient/ carer administers antimicrobials (S-OPAT)
Assessment at OPAT clinic (at least weekly/within 24-48 hrs for cellulitis)
Review by team and feedback to CIT
Continued antimicrobial stewardship review
Monitoring of response to therapy
Laboratory monitoring as per antimicrobial guidelines
Assess for medication side-effects
Vascular access for device monitoring
OPAT course completed
Outcomes database updated
Clinic follow-up
Communication with referring team
Remove vascular access device or communicate with CIT/referring team re removal of vascular access device
Condition fails to improve or complication develops
Readmission for therapy
Outcomes database updated

S-OPAT/ H-OPAT

- S-OPAT – self OPAT
  - Antimicrobials are administered by the patient themselves, or a family member or carer

- H-OPAT – healthcare provided OPAT
  - Antimicrobials administered by a nurse either in the patients home or an infusion centre in the community

National Standards for OPAT Provision

First written 2011, revised 2019

Local Protocols in place/ local implementation plan based on the National OPAT Guidelines

- Infectious Diseases, or local Physician Lead in conjunction with Clinical Microbiology service
- Clear pathway for identifying appropriate patients for OPAT and facilitating the referral
- Ensure ID/Microbiology advice is obtained for all OPAT patients.
- Patient consent
- All patients to be reviewed weekly while on OPAT and very early in treatment if short course antibiotics eg cellulitis
- Management of any issues arising at time of referral/ while the patient is on the OPAT service
- Pathway for review/ re-admission if required

Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 113; No. 7; P123

National Guidelines on the Provision of Outpatient Parenteral Antimicrobial Therapy (OPAT)

E. Sweeney[1], N. Curtin[2], E. de Barra[3], K. Burns[4], E. O'Neill[5], E. Feeney[6], H. Tuite[7], A. Jackson[8], P. Gavin[9], S. Clarke[1], S. O'Connell[10], E. Muldoon[2,11].

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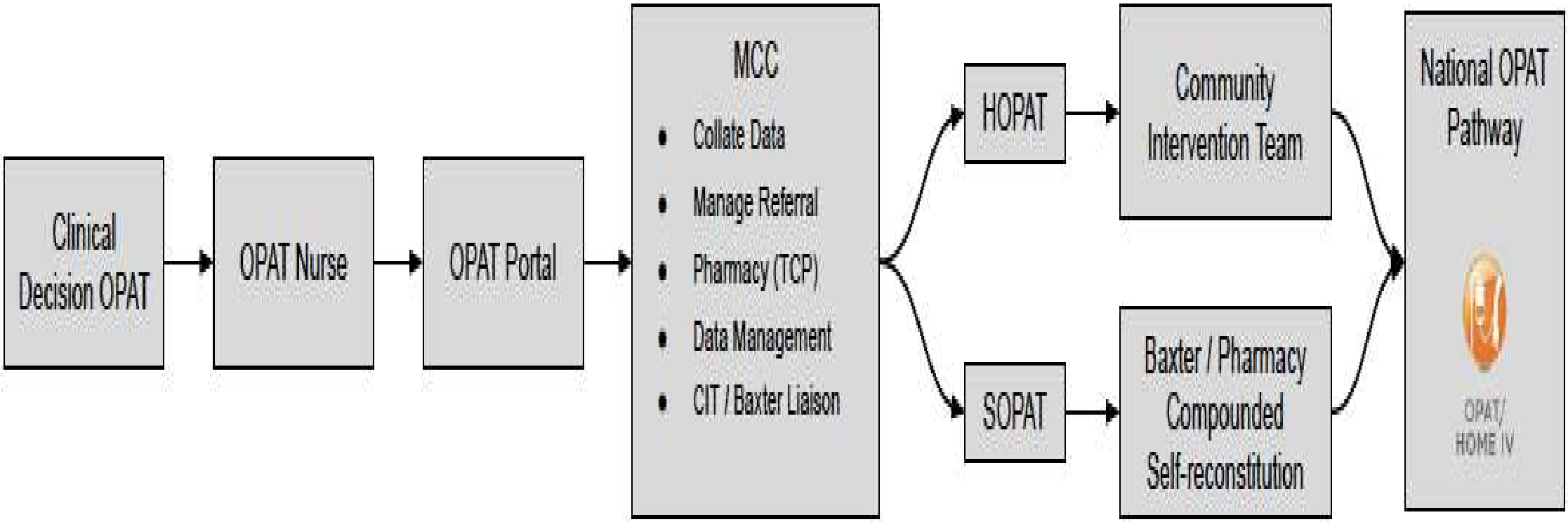
Steps in OPAT referral

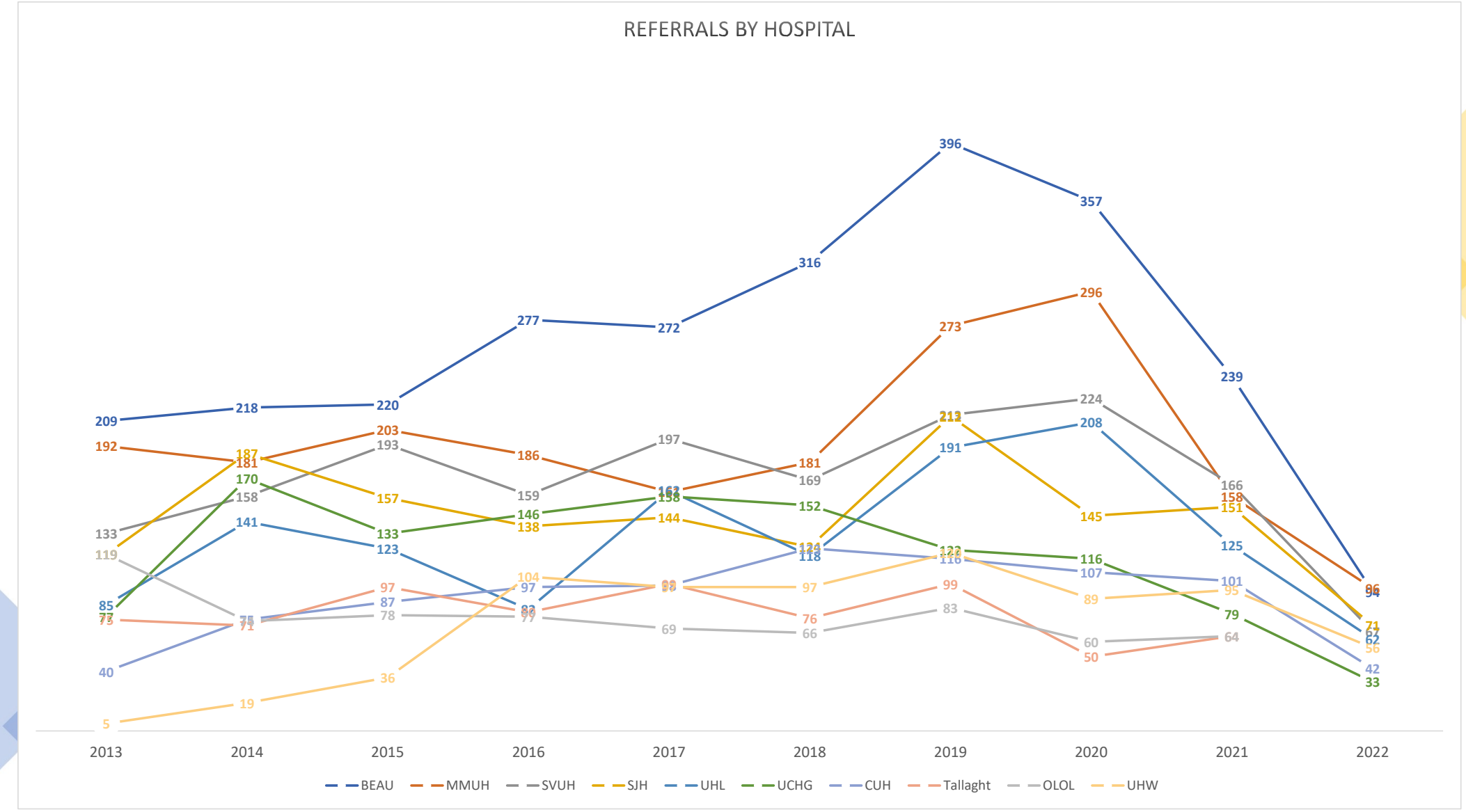


Management Control Centre

- Overview of the service
- Distribution of referrals onward to service providers
- Clinical, nursing, pharmacy review of referrals
- Liaison with teams, community and hospital
- Follow up on service complaints and issues as reported by patients/ health professionals
- Review of readmissions related to OPAT/ adverse events
- Clinical Audit of the Service
- Production of reports, monthly and annual
- Ongoing interaction with the HSE re service delivery and development
- Co-ordination of services eg disruption of compounding, re-call of product, adverse weather
- 24/7 on-call line

Where we are…

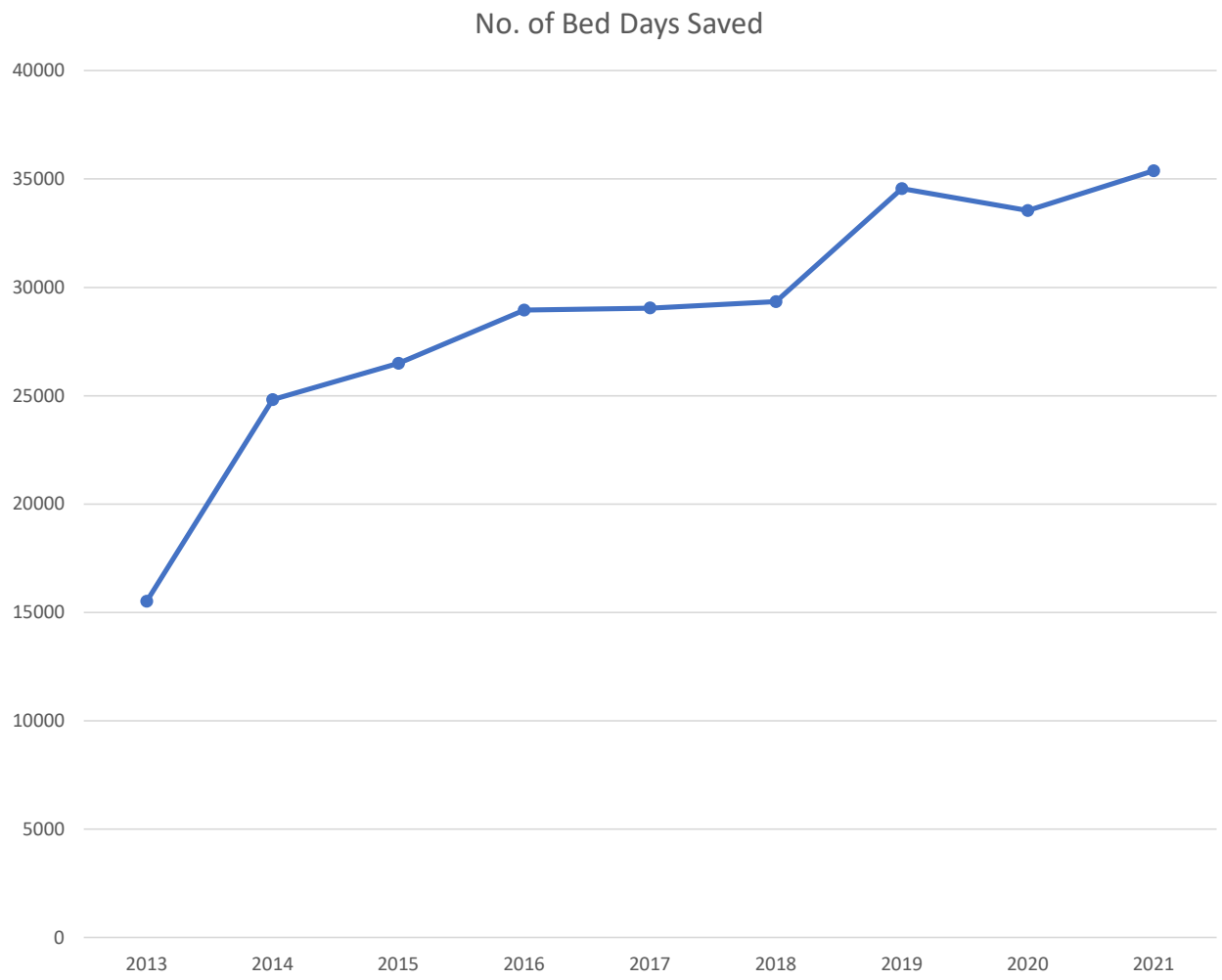
- In 2021 2613 referrals were received by MCC
  - 1556 new OPAT episodes
  - 274 extensions to active episodes
  - 275 cancelled/declined
  - 402 amendments
  - 106 CF referrals

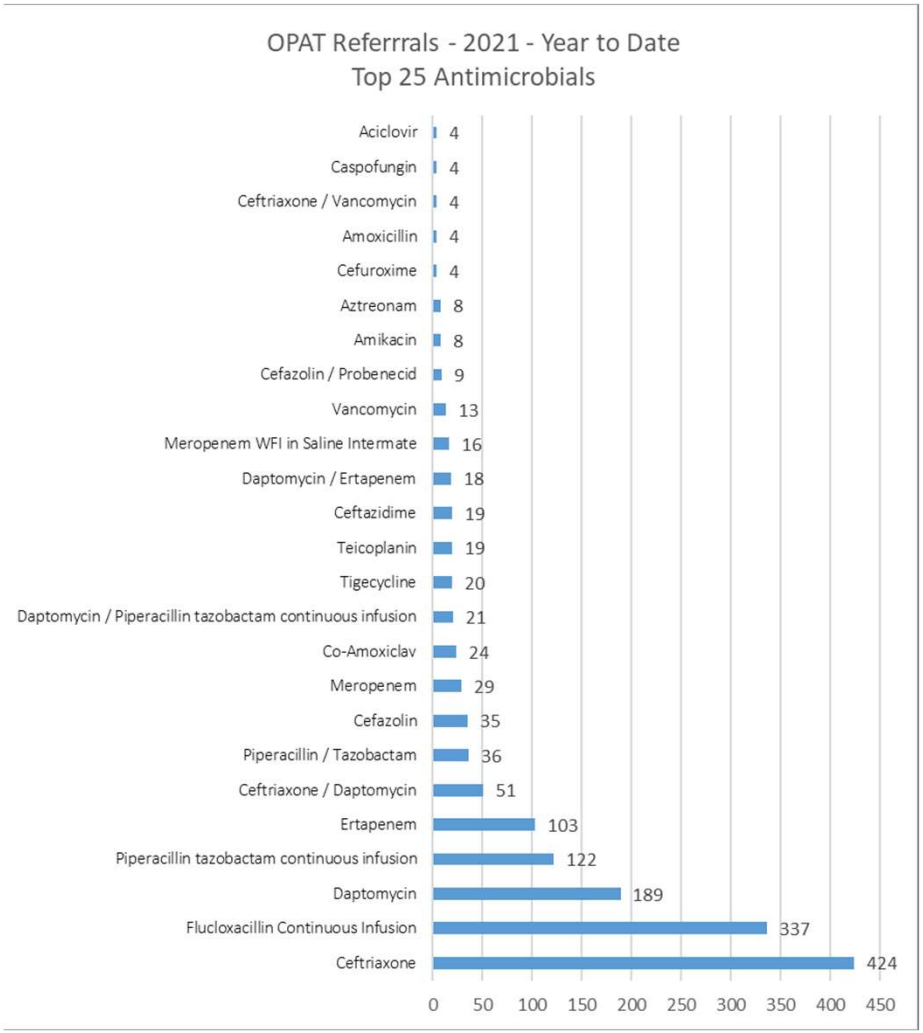

REFERRALS BY HOSPITAL
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
BEAU
MMUH
SVUH
SJH
UHL
UCHG
CUH
Tallaght
OLOL
UHW

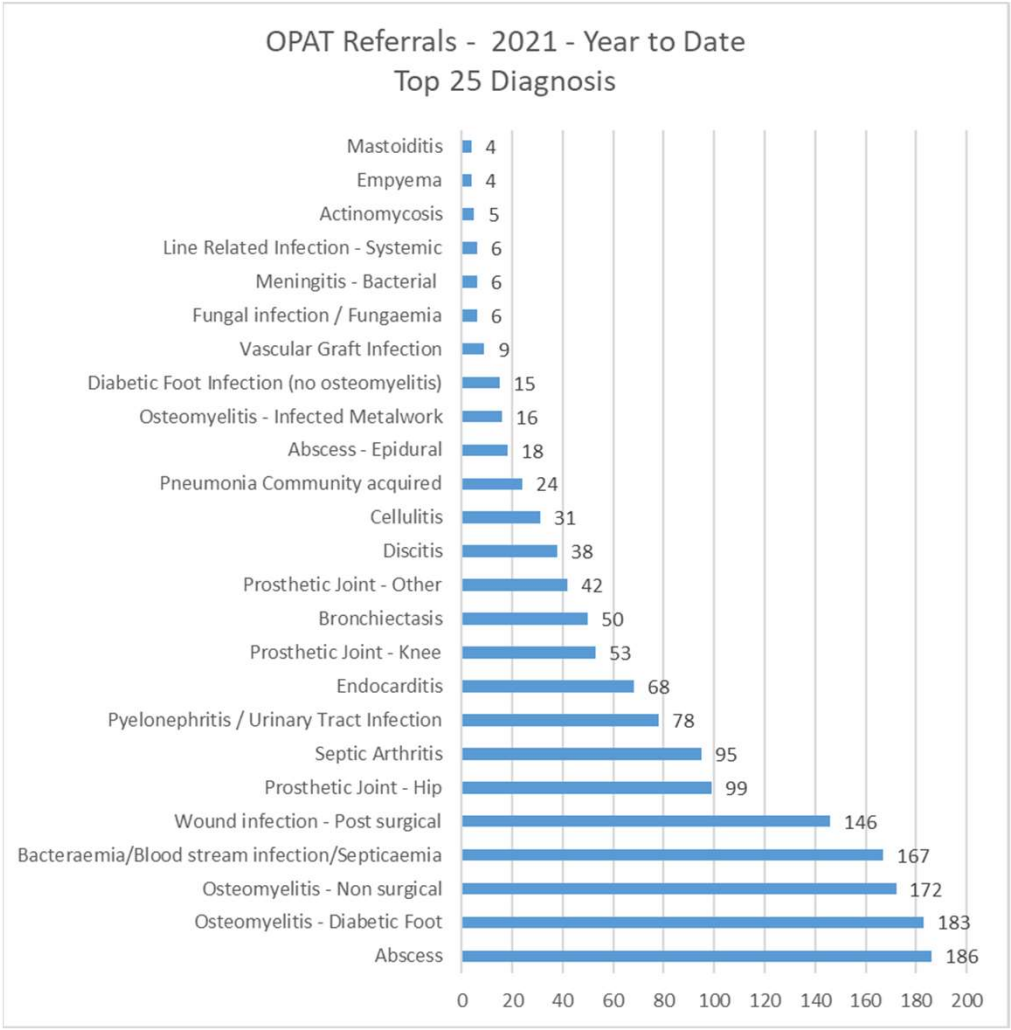
Prescribing Unit/Hospital	No. Of Referrals	% of Total Referrals	Top Antimicrobial
BEAU	239	15%	Ceftriaxone
SVUH	166	11%	Ceftriaxone
MMUH	158	10%	Ceftriaxone
SJH	151	10%	Ceftriaxone
UHL	125	8%	Piperacillin tazobactam continuous infusion
CUH	101	6%	Flucloxacillin Continuous Infusion
UHW	95	6%	Flucloxacillin Continuous Infusion
UCHG	79	5%	Flucloxacillin Continuous Infusion
Tallaght	64	4%	Flucloxacillin Continuous Infusion
OLOL	64	4%	Ceftriaxone

Bed days saved

- Total 257641

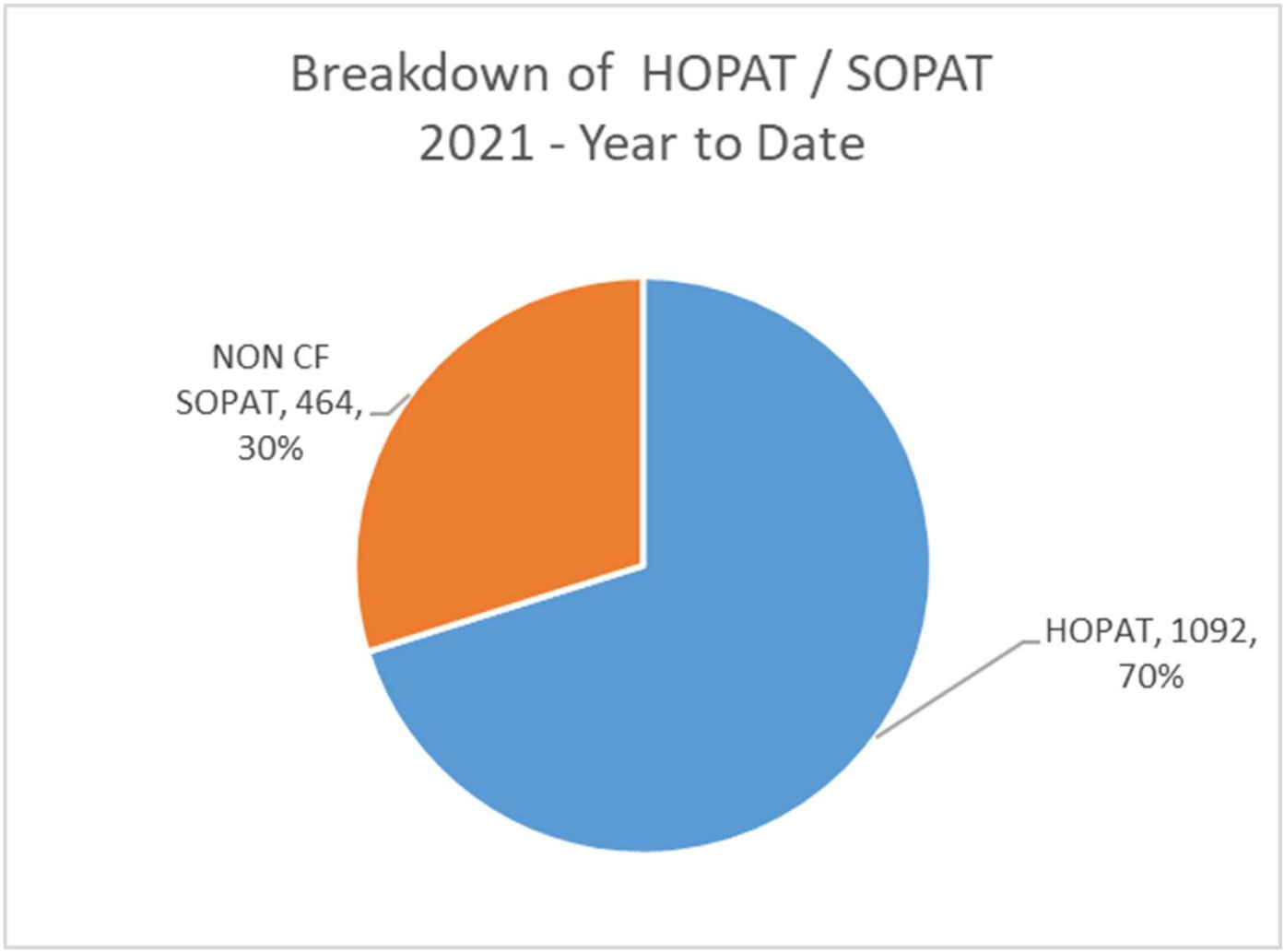


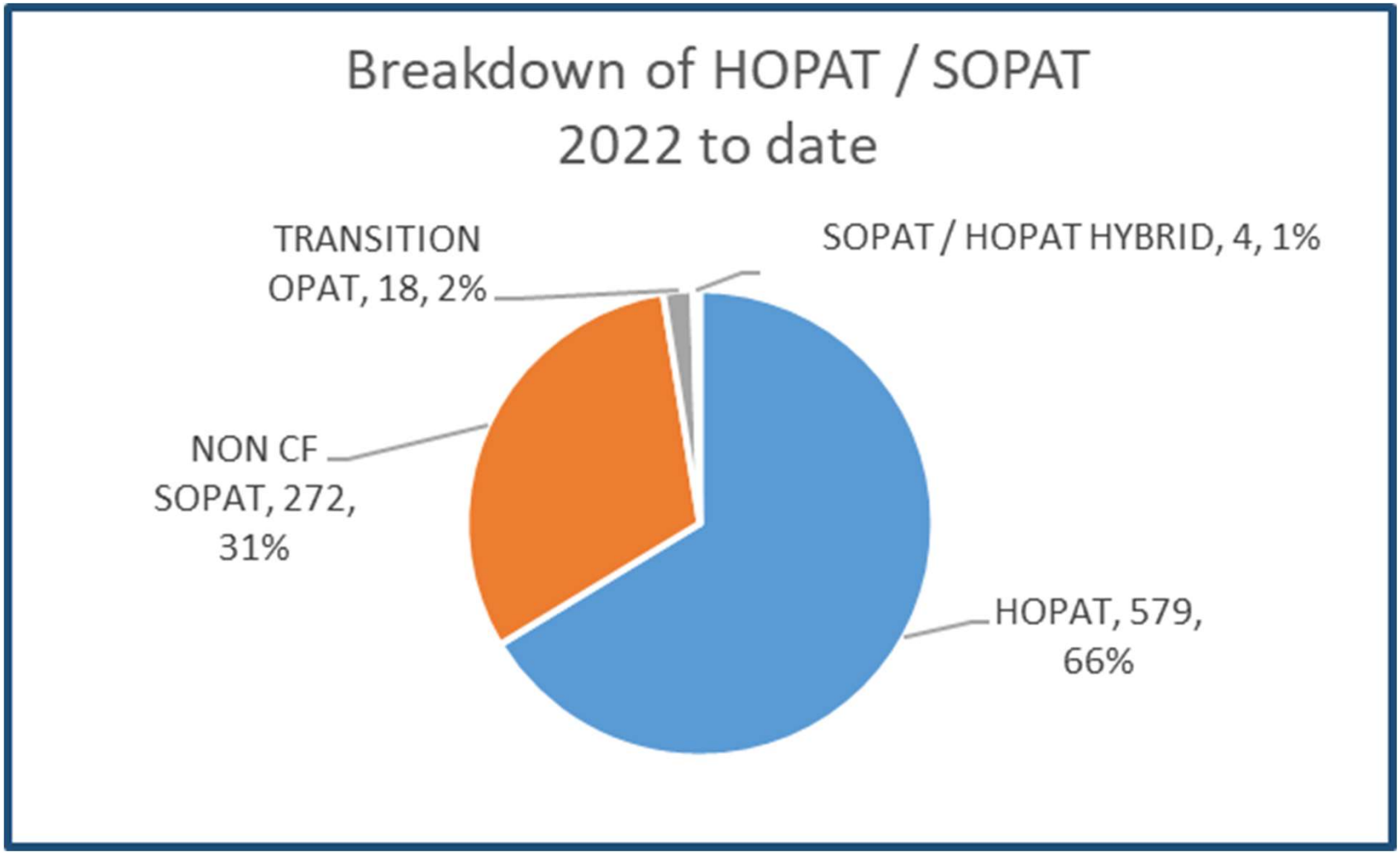

OPAT Referrrals - 2021 - Year to Date
Top 25 Antimicrobials
Aciclovir 4
Caspofungin 4
Ceftriaxone / Vancomycin 4
Amoxicillin 4
Cefuroxime 4
Aztreonam 8
Amikacin 8
Cefazolin / Probenecid 9
Vancomycin 13
Meropenem WFI in Saline Intermate 16
Daptomycin / Ertapenem 18
Ceftazidime 19
Teicoplanin 19
Tigecycline 20
Daptomycin / Piperacillin tazobactam continuous infusion 21
Co-Amoxiclav 24
Meropenem 29
Cefazolin 35
Piperacillin / Tazobactam 36
Ceftriaxone / Daptomycin 51
Ertapenem 103
Piperacillin tazobactam continuous infusion 122
Daptomycin 189
Flucloxacillin Continuous Infusion 337
Ceftriaxone 424
0 50 100 150 200 250 300 350 400 450


OPAT Referrals - 2021 - Year to Date
Top 25 Diagnosis
Mastoiditis 4
Empyema 4
Actinomycosis 5
Line Related Infection - Systemic 6
Meningitis - Bacterial 6
Fungal infection / Fungaemia 6
Vascular Graft Infection 9
Diabetic Foot Infection (no osteomyelitis) 15
Osteomyelitis - Infected Metalwork 16
Abscess - Epidural 18
Pneumonia Community acquired 24
Cellulitis 31
Discitis 38
Prosthetic Joint - Other 42
Bronchiectasis 50
Prosthetic Joint - Knee 53
Endocarditis 68
Pyelonephritis / Urinary Tract Infection 78
Septic Arthritis 95
Prosthetic Joint - Hip 99
Wound infection - Post surgical 146
Bacteraemia/Blood stream infection/Septicaemia 167
Osteomyelitis - Non surgical 172
Osteomyelitis - Diabetic Foot 183
Abscess 186
0 20 40 60 80 100 120 140 160 180 200

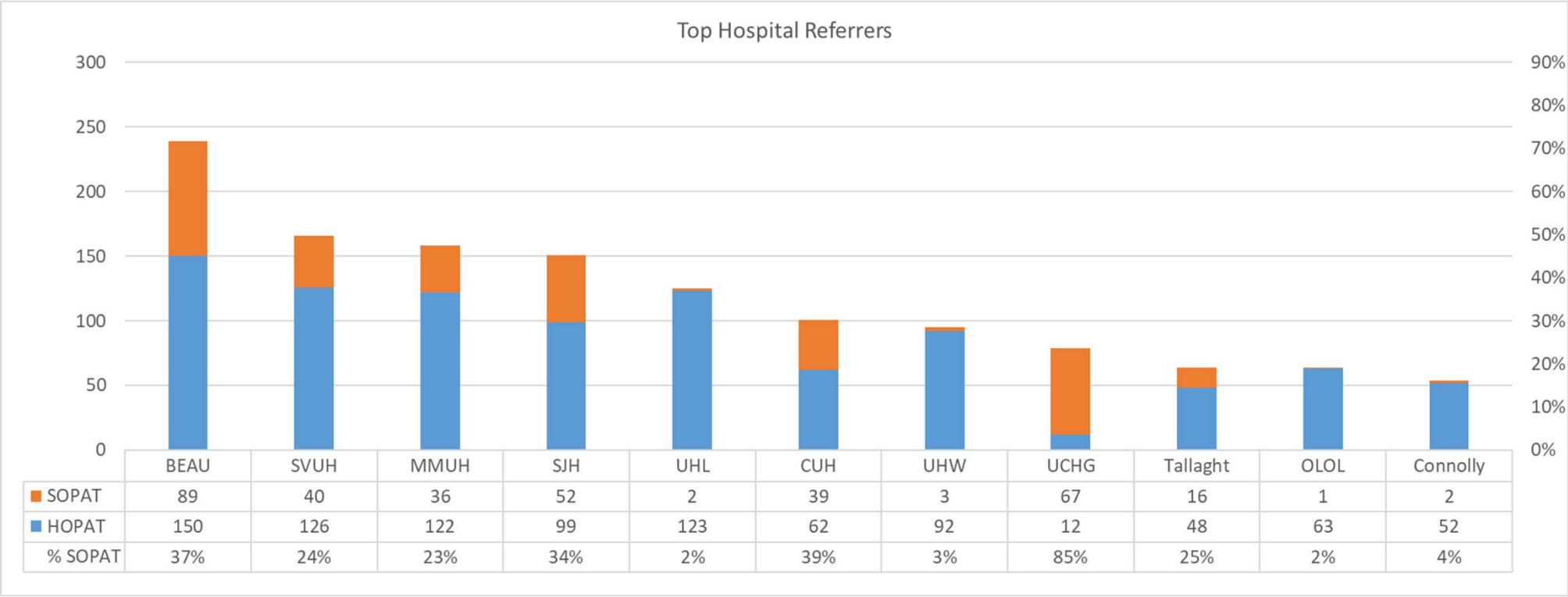
OPAT National Audit 2019

- Audited 29 centres who had made OPAT referrals
  - 21 responses, accounted for 80% of referrals made
- 70% H-OPAT
- Numerous duplicate diagnoses. 94% recorded diagnosis correct
  - 1 diagnosis not an infection!
- 90% discharging physician correct
- Mean time from referral to discharge was 2 days (range 0-21 days)
- Data for whether or not patients were seen weekly was available for 287 referrals.
  - 33/286 (12%) of referrals were not seen weekly in clinic from 9 centres.
  - Where an ID physician is discharging physician 87/97 seen weekly, compared to 126/189 not ID physician (χ^2 p=.00002)


Breakdown of HOPAT / SOPAT
2021 - Year to Date
NON CF SOPAT, 464, 30%
HOPAT, 1092, 70%

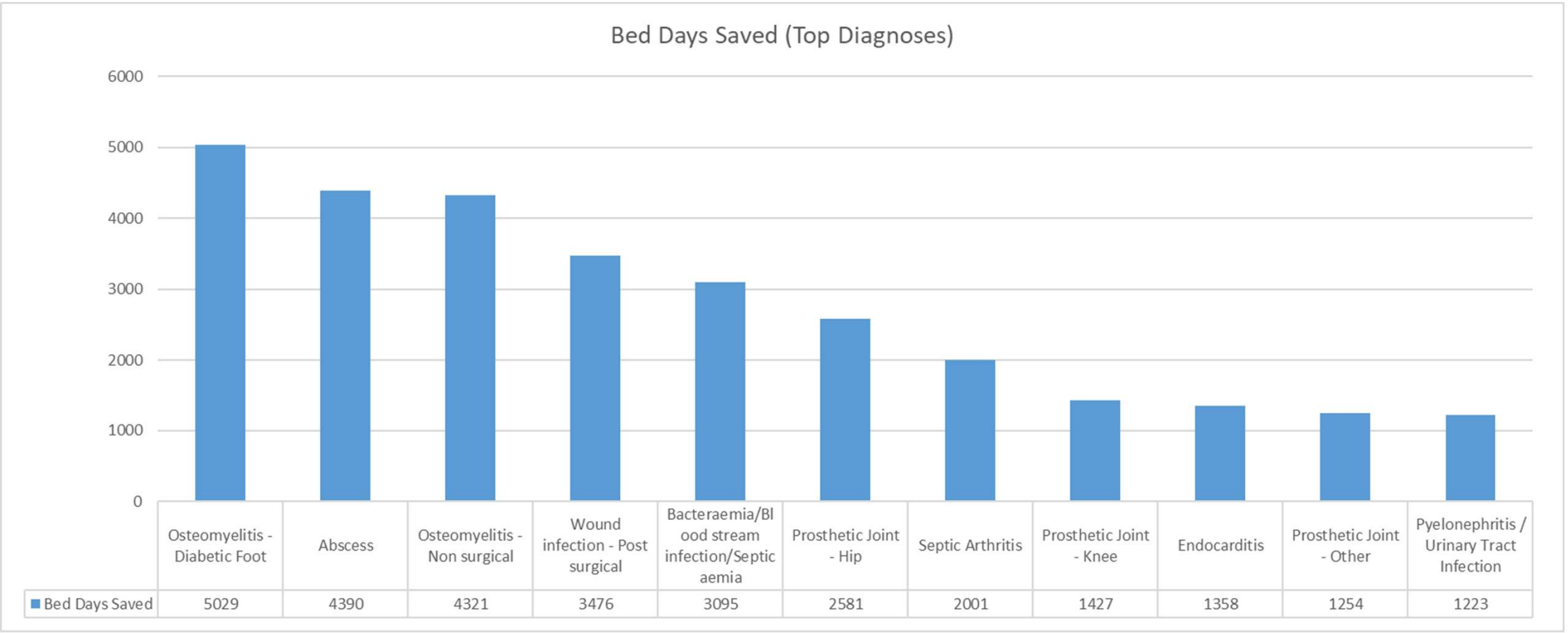

Breakdown of HOPAT / SOPAT
2022 to date
TRANSITION OPAT, 18, 2%
SOPAT / HOPAT HYBRID, 4, 1%
NON CF SOPAT, 272, 31%
HOPAT, 579, 66%

2021

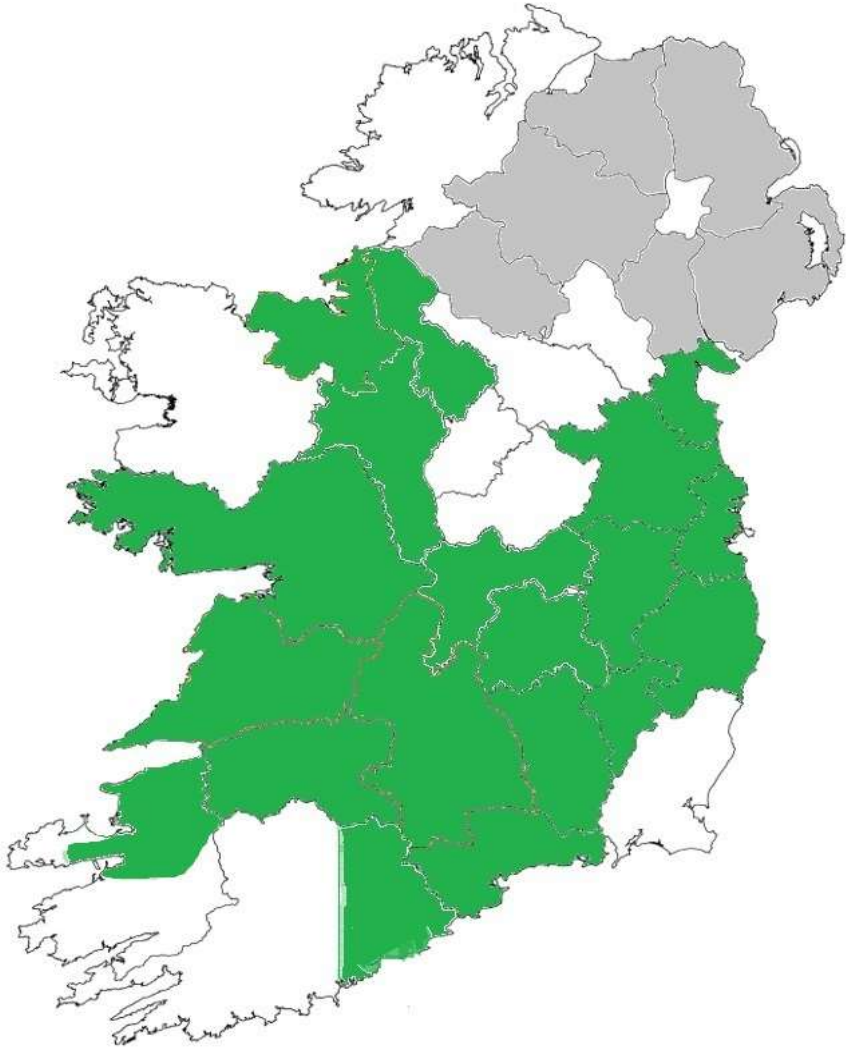


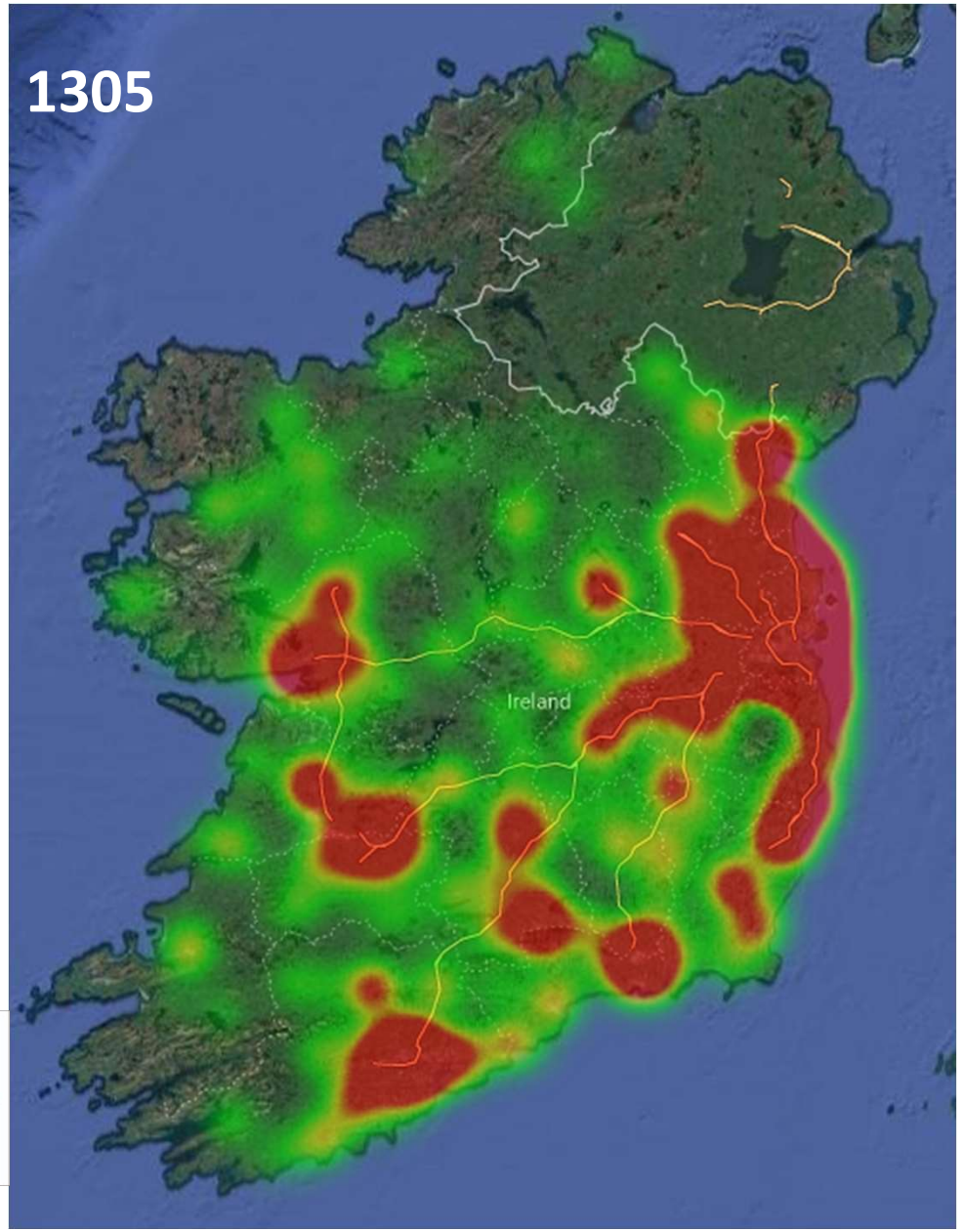
	BEAU	SVUH	MMUH	SJH	UHL	CUH	UHW	UCHG	Tallaght	OLOL	Connolly
SOPAT	89	40	36	52	2	39	3	67	16	1	2
HOPAT	150	126	122	99	123	62	92	12	48	63	52
% SOPAT	37%	24%	23%	34%	2%	39%	3%	85%	25%	2%	4%

Top diagnoses 2021



CIT locations Sept 2019





Cellulitis pathway

- There is a national Cellulitis pathway offered via the National OPAT programme
  - Hospital or GP referral
- Guidance on severity of infection
- Clear exclusion criteria
  - Age < 16 years, Facial cellulilitis, Diabetes related infections, Renal impairment, Penicillin allergies, Cellulitis overlying a joint, Systolic BP <100mmHG, Cellulitis associated with a bursitis, Pain out of proportion to the appearance of the cellulitis, Rapidly spreading and blistering cellulitis, History of IVDU, Other active medical problems, History of C diff Infection, Patient unable to be reviewed by the GP in the next 24 hours, GP unable to obtain FBC, U&E, LFTs and CRP pre treatment
- Mild-Moderate Cellulitis – I-II
  - Oral therapy
  - Or cefazolin with probenecid
- Moderate- Severe Cellulitis – III-IV
  - Hospital referral

AMS

- The national pathway and standards specify that all patients must have an infection specialist involved in the decision to discharge a patient with OPAT
  - In recent audit mean time 9 days (range 0-57 days), in centres without a formal OPAT team
  - Unchanged in new guidelines
  - MCC requirement for referral to proceed

- Avoidance of TDS dosing

- 23h infusers have allowed the use of flucloxacillin

AMS

QI ongoing with OPAT portal

Improved diagnosis list

Linked to common causative organisms

Linked to appropriate antimicrobial choices

New standard added for prolonged OPAT courses >6 weeks

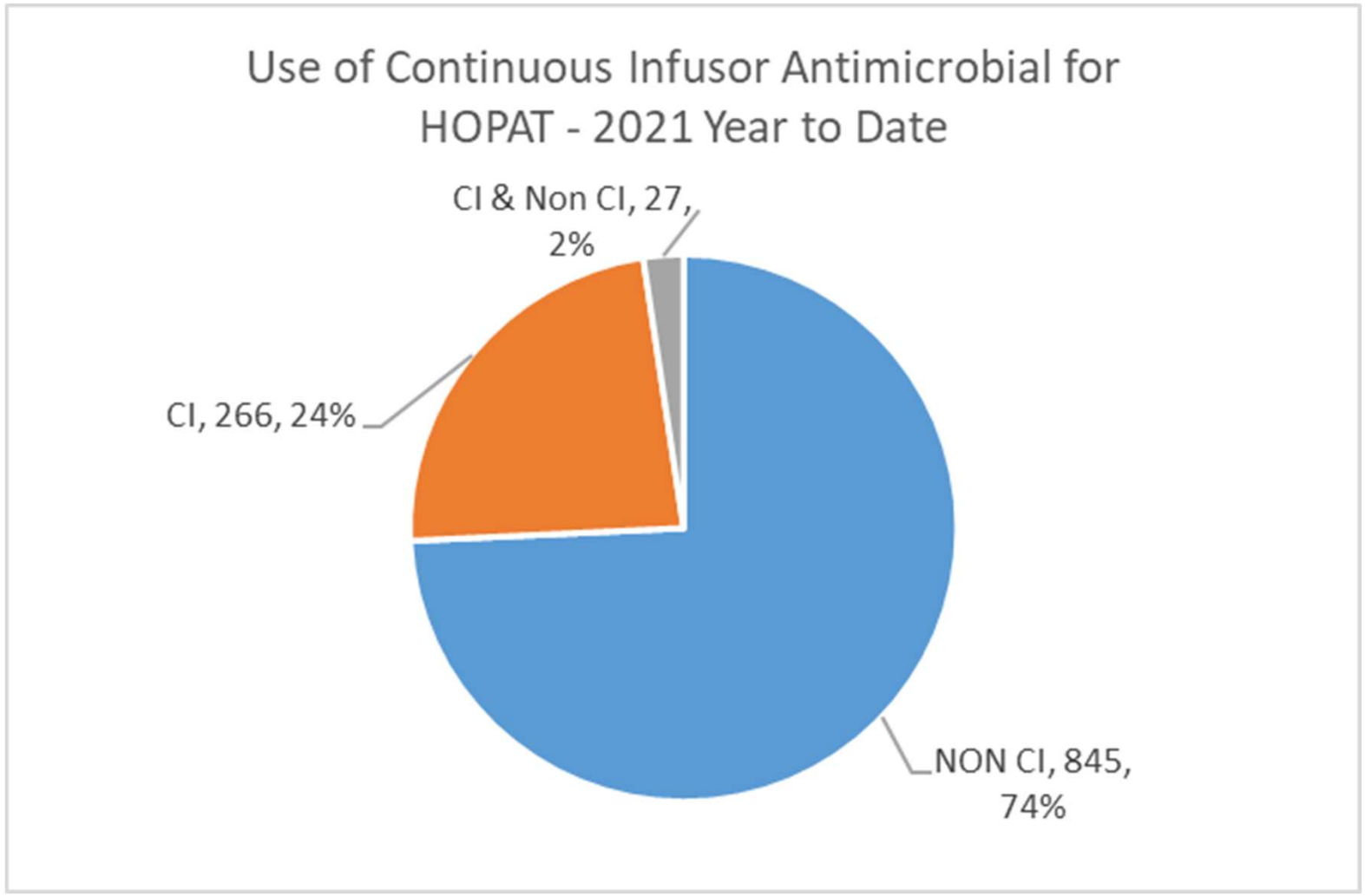
Rationale must be provided in writing (email) from the **infection specialist** involved

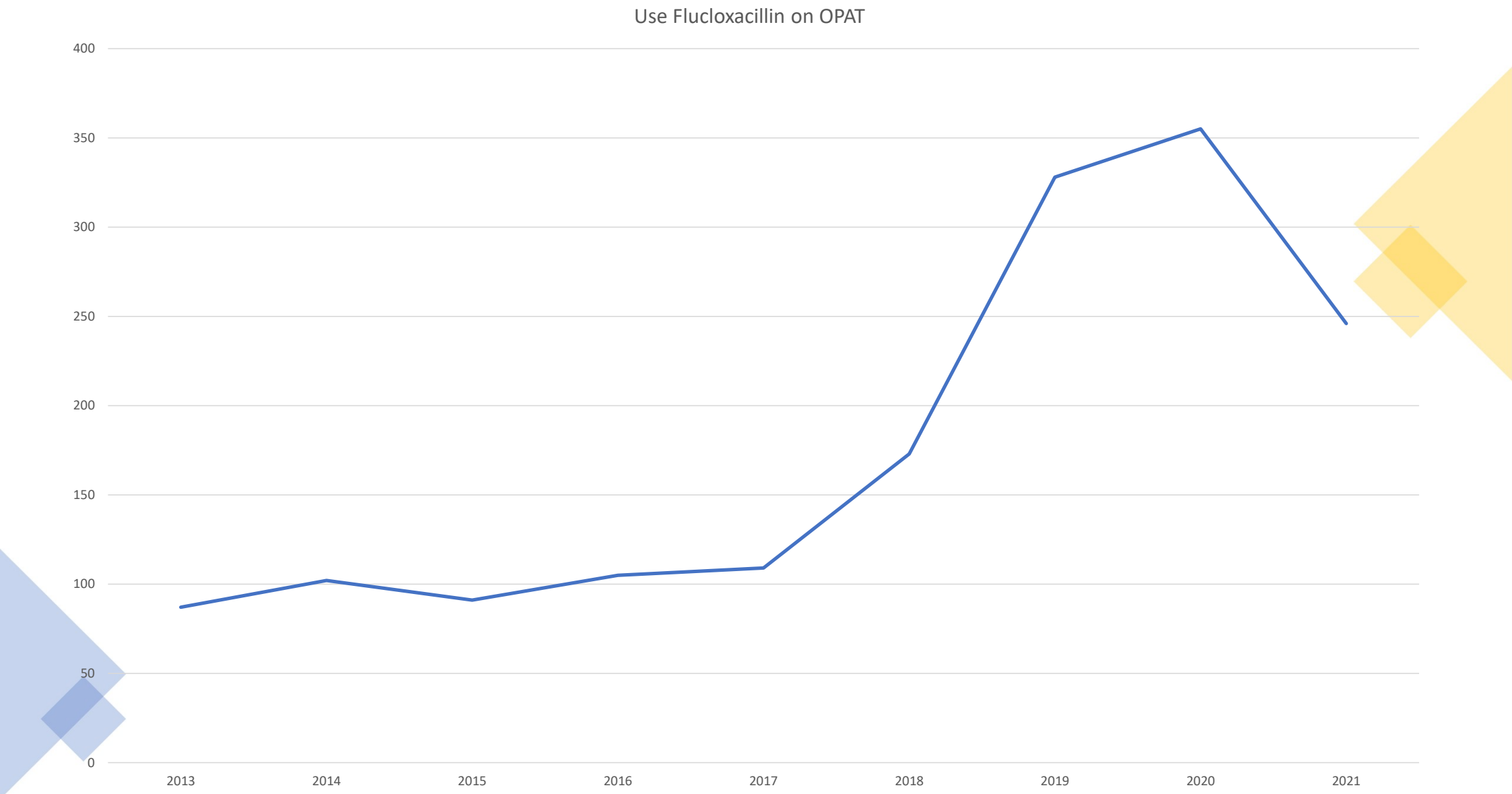
Ideally these patients should be followed in an infection clinic where possible

23h Infusions

- Now available for Flucoxacillin (8 or 12g)
- Piperacillin/ tazobactam
- Provided by Baxter

- Plan for benzylpenicillin


Use of Continuous Infusor Antimicrobial for HOPAT - 2021 Year to Date
CI & Non CI, 27, 2%
CI, 266, 24%
NON CI, 845, 74%


Use Flucloxacillin on OPAT
400
350
300
250
200
150
100
50
0
2013
2014
2015
2016
2017
2018
2019
2020
2021

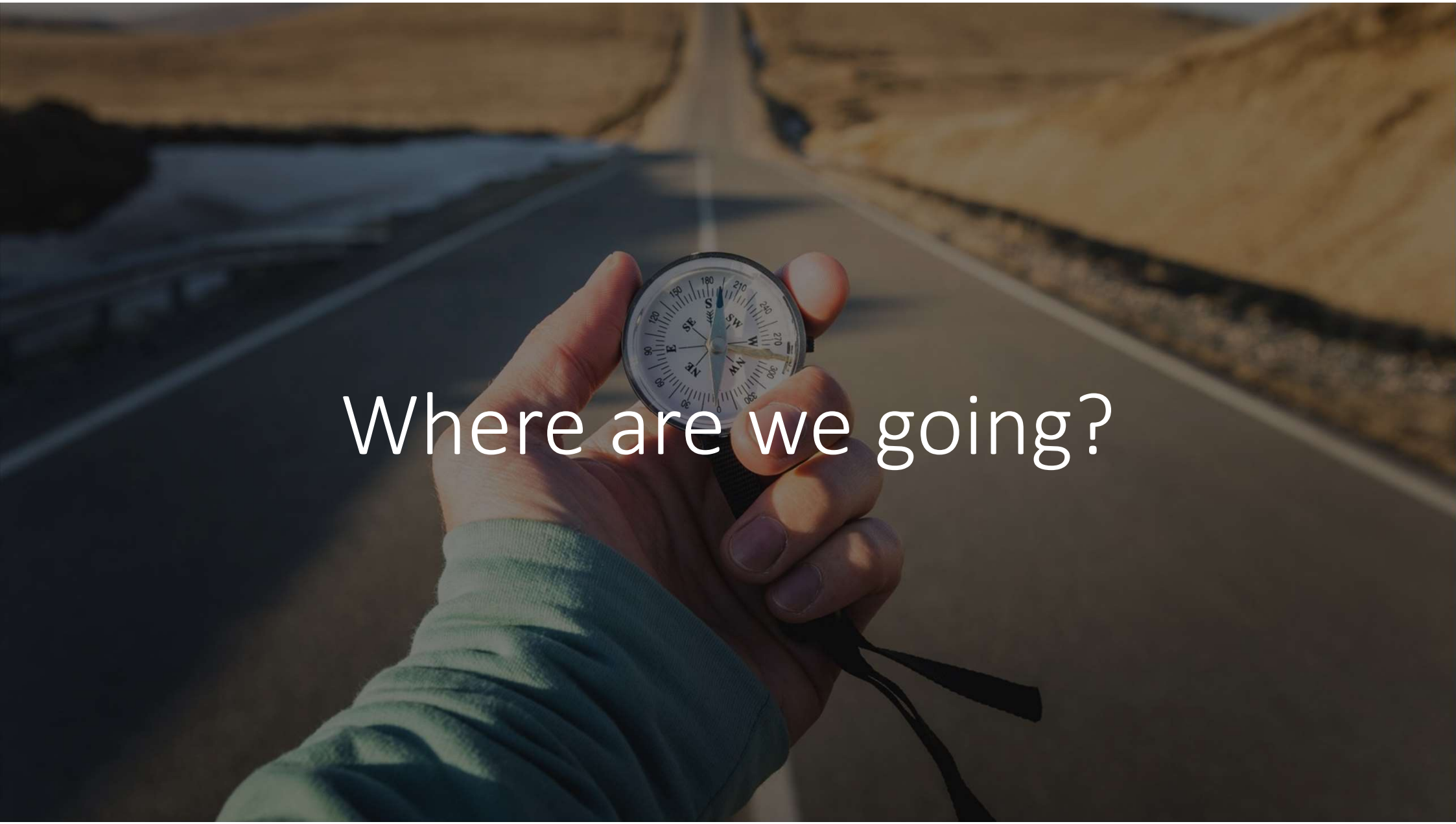
Readmissions - 2021

- 84 of the readmissions for 2021 were deemed to be OPAT related readmissions.
  - 55 x Progression of infection / Failure of infection to resolve
  - 13 x Medication Side Effects or Adverse Events
  - 10 x Line Associated Complications
  - 6 x Other

- Aim is to have OPAT associated readmissions <6%
- Ask centres to audit if greater than this
- Overall nationally 5% of readmissions in 2021 were OPAT related

Other developments

- CIT led PICC and midline services
- Intravesical aminoglycosides
- COpAT
  - Complex outpatient antimicrobial therapy
  - Agents that require close monitoring
    - E.g. linezolid, antifungals etc.


Where are we going?

Improvements in data management

QI project to improve diagnoses list on OPAT portal

Diagnoses, organisms, and antimicrobials

Improvement in data management and collation

Including recording outcomes and adverse events on OPAT

Collaboration with HPSC

Antimicrobial consumption data from the OPAT programme

Benchmarked with hospital consumption

Advanced Nurse practitioner Roles

- Newly developed roles within OPAT
- 5 roles in the first instance
  - MMUH, SVUH, Beaumont, UHG, CUH
- Recently recruited as cANP positions
- Watch this space

Summary

The national OPAT programme has been very successful in providing safe and effective care to patients
Need to build on the success, be flexible to changing practice, and to improve measurement of outcomes in patients treated with OPAT
Urgent need to improve the IT infrastructure which supports the programme
Upcoming tender processes may provide opportunities and new challenges

Questions?

Acknowledgments

Dr Paul Reidy ID SpR
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The National OPAT working group