

Always!

Best care!

www.bestcare.org.za

The Campaign

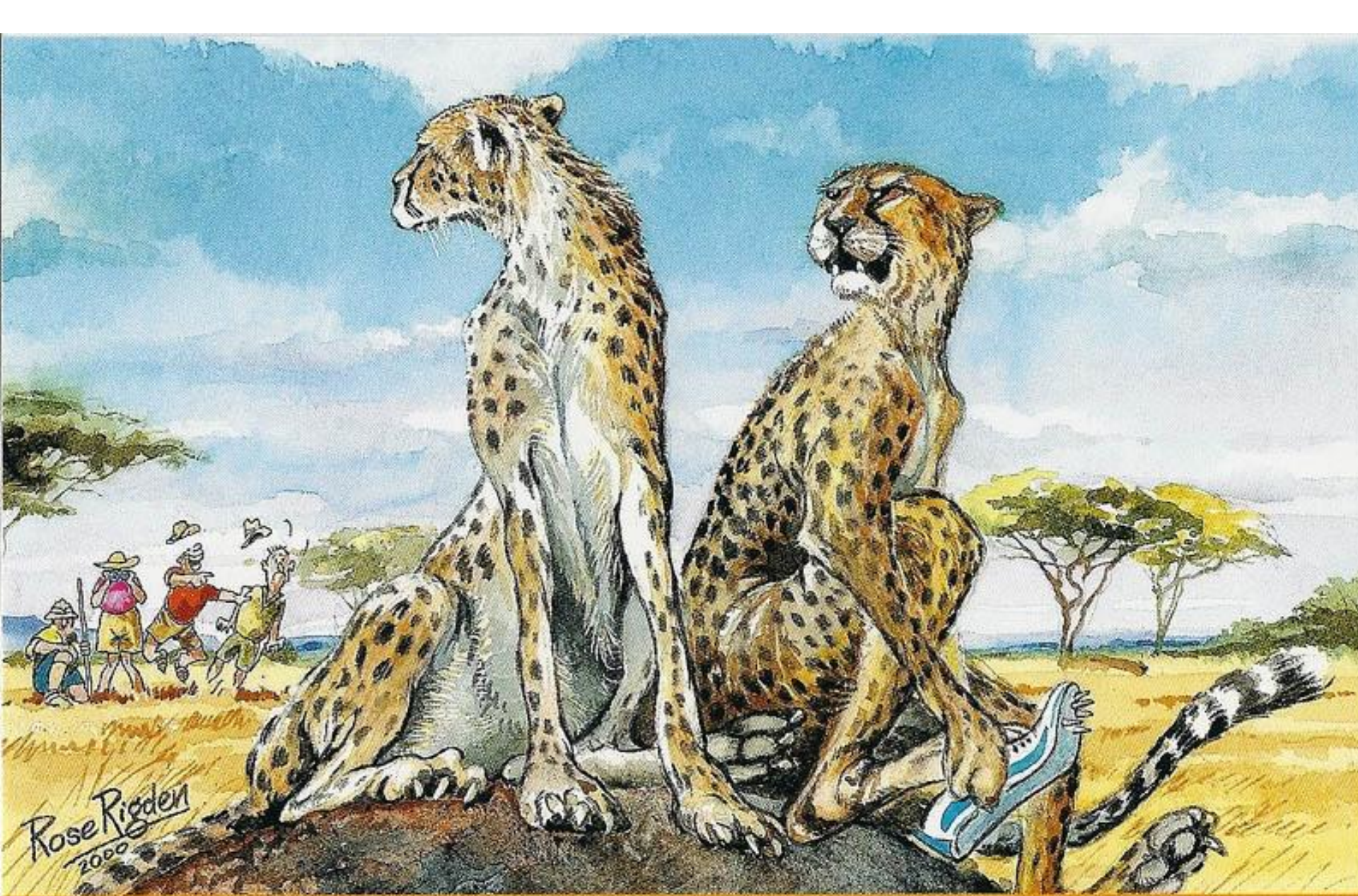
Dr Gary Kantor, Dr Dena Van Den Bergh
February, 2010



Global
**Antibiotic
Resistance**
Partnership


CDDEP THE CENTER FOR
Disease Dynamics,
Economics & Policy
WASHINGTON DC • NEW DELHI





The next tourist that calls me a leopard gets to be lunch

Throughout the World, Patients are in Hospital are Often Harmed By Care

	<u>Sample Size</u>	<u>Injury Rate</u>	<u>% Preventable</u>	<u>% Life-threatening or Fatal</u>
HMPS (1984)			3 – 17%	13.6%
UTAH-COLO			14 – 58%	6.6%
AUSTE			3 – 48%	19%
UK	1,000	12%	14%	48%
CANADA (2000)	3,745	7.5%	37%	21%
DENMARK	1,1	 ???	40%	3%
NEW ZEALAND	6,500	13%	35%	15%

The International Response...



Hospital-Acquired Infection

- International:
 - Nosocomial infection rates 5-10%
 - 1.4 million patients affected each day
 - USA: 100,000 deaths, \$6.5 billion cost
- SA hospitals (Duse) :
 - 9.7% point prevalence
 - 28.6% in ICU

1. JAMA. 2009;301(12):1285-1287
2. Lancet. 2008;372(9651):1719-1720

Design for Reliability

Reliability:

1:100,000

10^{-5}

10^{-4}

10^{-3}

10^{-2}

1:10

10^{-1}

Level 3

- High Reliability Organisations

Level 2

- Reliability science, **process redesign**, human factors

Level 1

- Intent, vigilance, hard work

NB The goal is optimised processes not perfect outcomes

Central Line Infection

- Central-line associated bloodstream infection (CLABSI).
- 5 - 20% risk of death.
- Hospital stay increase (7-12 days).
- Cost increase (\$18,000)(USA).

Results...

- A multi-step central line “bundle” can nearly eliminate catheter-related bloodstream infections.
- This has been achieved at the level of single hospitals, an entire state (Michigan)(>100 ICUs), even an entire country (Canada).
- Thousands of lives saved.
- Major cost savings.

Critical Care Medicine 2004; 32:2014-2020

New England Journal of Medicine 2006; 355(26): 2725-2732



The Opportunity

- What if a few “simple” interventions could markedly reduce common, serious, adverse events in hospitalized patients?
- What if we already knew what those interventions are?
- What if we implemented all of them, always, on every eligible patient?

What is a Bundle?

- A grouping of evidence-based best practices that individually improve care, but when applied together result in substantially greater improvement.
- The science behind the bundle is so well established that it should be considered standard of care.
- Bundle elements are dichotomous and compliance can be measured: yes/no answers.

Central Line Bundle Elements

1. Hand hygiene.
2. Maximal barrier precautions.
3. Chlorhexidine skin antisepsis.
4. Optimal catheter site selection, with subclavian vein as the preferred site.
5. Daily review of line necessity with prompt removal of unnecessary lines.

Begin with 5 Interventions

ALIGNED TO INTERNATIONAL BEST PRACTICE

1. Prevention of central line infections (CLABSI)*
2. Prevention of ventilator-associated pneumonia (VAP)*
3. Prevention of surgical site infection (SSI)*
4. Prevention of catheter associated urinary infections (CAUTI)*
5. **Improving antibiotic stewardship...**

Who?

- Major private hospital groups
 - Clinix, Life Healthcare, Medi-Clinic, Netcare, NHN
 - Hospital Association of S Africa (HASA)
- NDoH and public sector
 - Endorsement by National Dept of Health
 - Public Sector Hospitals (Gauteng, West Cape)
- Funders
 - Discovery, Medscheme
- Professional community
 - CCSSA, FIDSSA, SAMA, SpesNet, SASA, ICSSA
- Sponsors
 - Discovery Health – Platinum Founding
 - Janssen-Cilag - Gold Founding
 - Media sponsor – Medical Chronicle



You're in safe hands



Private hospital group



[Your partner in integrated health care]

Dept of Health 10 Point Plan

- #2 Improving the Quality of Health Services
- “Adoption and implementation of quality improvement plans, covering **safety, infection prevention and control measures**, waiting times and **cleanliness**”
- “1000 public health facilities with Quality Improvement Plans (QIPs)”

<http://www.info.gov.za/aboutgovt/poa/report/humandev.htm>



Why?

The interventions themselves and even the elements of the bundles are not new (and not a cure-all).

So why a campaign called Best Care Always! when there is nothing really new?



What is New? ...

Accelerated pace, scale and spread – of a set of best practices to improve patient care in **specific targeted** areas known to be important.

Implementing all elements of each bundle to every patient every time - because those that say “we already do that”, when measured do not do it all every time.

Bringing clinical teams together - within individual units this work brings clinical teams together and creates the capacity, will and motivation for ongoing improvement work .



What is New? ...

Collaboration - different stakeholders within the private sector and between the private sector and public sector

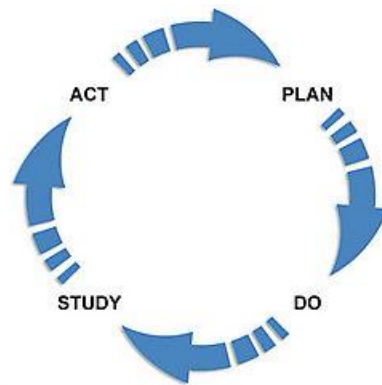
Shared learning - we have agreed to *share what we learn and help each other* achieve the objective of best care to every patient every time.

Partnerships - clinical leadership organizations in South Africa have agreed to partner us to support implementation and to elevate skills and knowledge of health professionals in the identified areas.



A Model for Improvement

- What are we trying to accomplish?
- How will we know a change is an improvement?
- What changes can we make that will result in an improvement?



The Campaign

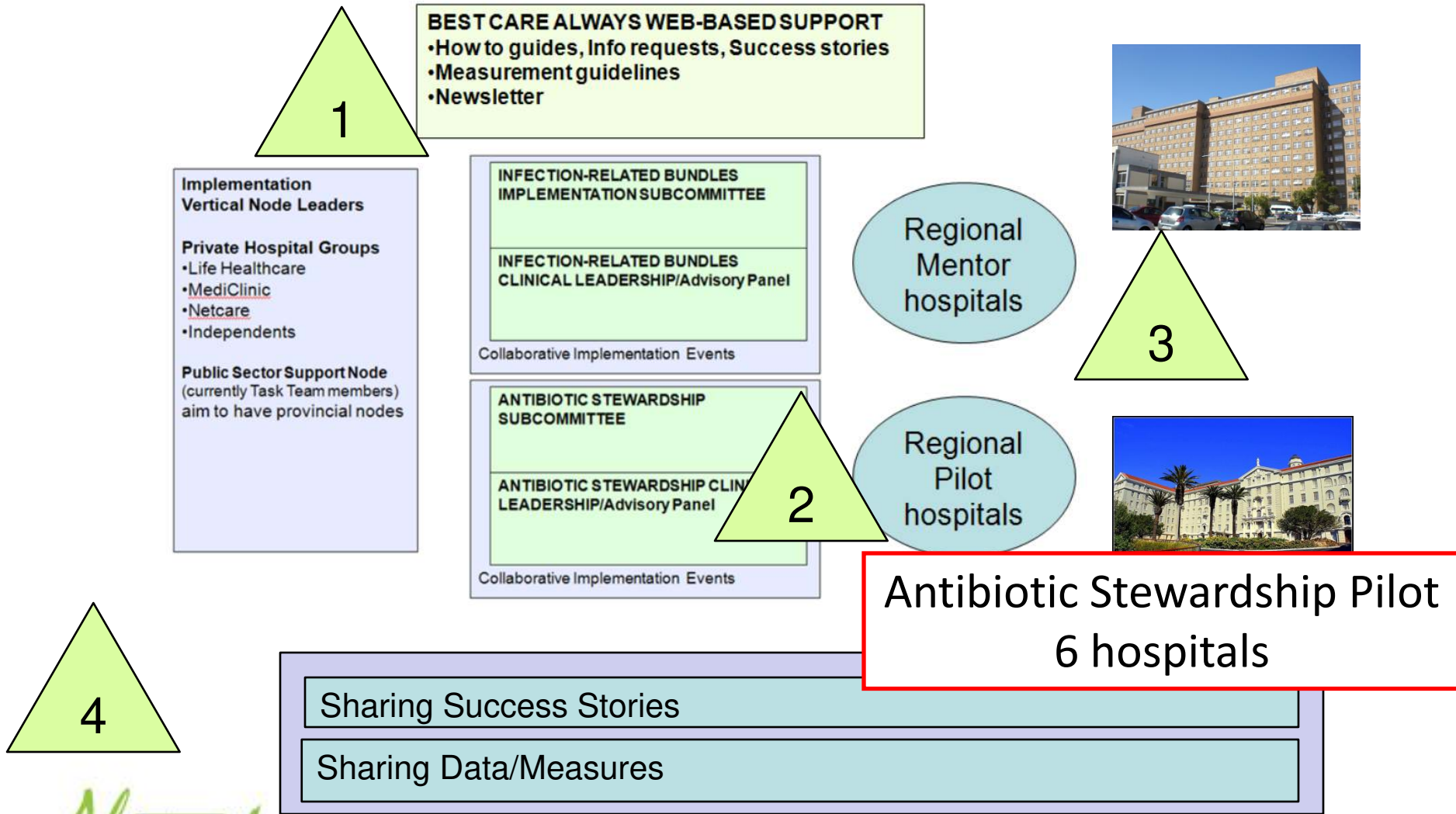
Collective Goals:

1. All S African hospitals sign up ≥ 1 intervention

To date, 137 hospitals have signed up for one or more campaign interventions.

- e.g. "Getting to Zero"

Implementation



Antibiotic Stewardship

Table I. Antibiotic resistance (%) among bacteraemic strains of selected Gram-negative pathogens in private institutions in 7 major centres* in South Africa, July December 2007

Antibiotic	<i>E. coli</i> (N=503) Overall (range)	<i>K. pneumoniae</i> (N=548) Overall (range)	<i>Enterobacter</i> spp. (N=190) Overall (range)
Ampicillin	82 (65 - 90)	100 (-)	100 (-)
Co-amoxiclav	39 (0 - 57)	62 (31 - 73)	99 (91 - 100)
Cefuroxime	18 (0 - 33)	62 (31 - 72)	83 (0 - 96)
Ceftriaxone/cefotaxime	7 (0 - 15)	57 (43 - 66)	62 (44 - 91)
Cefepime	5 (0 - 14)	54 (50 - 64)	26 (10 - 46)
Piperacillin-tazobactam	9 (0 - 23)	49 (26 - 67)	38 (17 - 66)
Ciprofloxacin	16 (0 - 36)	39 (18 - 64)	16 (0 - 40)
Levofloxacin	16 (0 - 36)	39 (28 - 64)	16 (0 - 40)
Gentamicin	14 (0 - 32)	31 (0 - 43)	25 (10 - 52)
Amikacin	6 (0 - 15)	25 (8 - 50)	6 (0 - 16)
Ertapenem	2 (0 - 8)	2 (0 - 8)	5 (0 - 17)
Imipenem	1 (0 - 6)	1 (0 - 1)	1 (0 - 5)
Meropenem	1 (0 - 6)	1 (0 - 1)	1 (0 - 5)
% ESBL production	5 (0 - 11)	50 (33 - 59)	23 (9 - 37)

**Adrian Brink, Charles Feldman, Guy Richards,
Johan Moolman, Marthinus Senekal**
SAMJ August 2008; 98(8): 585



Antibiotic Stewardship

“the antibiotic prescribing fraternity has not yet accepted stewardship of the emerging problem of XDR Gram-negative bacilli”

**Adrian Brink, Charles Feldman, Guy Richards,
Johan Moolman, Marthinus Senekal**
SAMJ August 2008; 98(8): 585

Antibiotic Stewardship

“To delay the imminent end of the antibiotic era, it may well be time now to challenge the right of doctors to prescribe whichever antibiotic they wish, including the dosage and duration”.

**Adrian Brink, Charles Feldman, Guy Richards,
Johan Moolman, Marthinus Senekal**
SAMJ August 2008; 98(8): 585

ABx Stewardship Challenges

- Threat to clinical autonomy.
- Need for clear, quantifiable goals.
 - Resistance (?)
 - Process measures more feasible
- No antibiotic stewardship “bundle” (yet)
- Measurement/data systems immature.
- Hospital (ICU) focus of the campaign
- Diversity vs standardisation

“Known” Prescribing Issues

- Empiric therapy without confirmation
- Inappropriate agent choices
- Inappropriate combinations
- Failure to de-escalate
- Excessive duration treatment / prophylaxis
- Inappropriate prophylaxis
(agent/timing/duration)

"LOOSE"

- Clinical practice guidelines
- "Academic detailing", opinion leaders (tool kits)

- Selective antibiotic reporting (registry)

1. Antibiotic stewardship rounds in ICU.
2. Implementation of best practice / protocols (?)
3. Antibiotic prescription form and other tools

Access/collaboration/consultation with labs & infectious disease experts

Multi-disciplinary antibiotic stewardship



Prescribing Issues

Measures (Brink)

- Empiric therapy without confirmation Samples
 - Inappropriate agent choices Duplicate spectrum
 - Inappropriate combinations
 - Failure to de-escalate ≥4 agents
 - Excessive duration treatment ≥10-14 days
 - Inappropriate prophylaxis (agent/timing/duration) >24 hrs
- SSI Bundle

HOSPITAL LOGO HERE

Antibiotic Stewardship Project
PRESCRIPTION Form



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Pt Name/Label	SIGNIFICANT DIAGNOSES: <input type="checkbox"/> Renal Impairment <input type="checkbox"/> Neutropenia <input type="checkbox"/> HIV/AIDS	AGE:	ALLERGIES:
	PROCEDURES:	WT: HEIGHT:	

INSTRUCTIONS. Prescribing doctor please complete shaded areas and check this form each day for ID/Microbiology/Pharmacy feedback. Prophylactic antibiotics: indicate agent, procedure (above) and indication. Therapeutic antibiotics: complete all sections.

AGENT:	1. INDICATION: <input type="checkbox"/> Prophylactic <input type="checkbox"/> Therapeutic	2. SAMPLE: <i>e.g. MC&S</i>	<input type="checkbox"/> None <input type="checkbox"/> Before ABx <input type="checkbox"/> After ABx	3. INFECTION SOURCE:	<input type="checkbox"/> Hospital <input type="checkbox"/> Unknown <input type="checkbox"/> Community
	4. CONDITION:	<input type="checkbox"/> Pneumonia <input type="checkbox"/> VAP <input type="checkbox"/> UTI	<input type="checkbox"/> Sepsis <input type="checkbox"/> Central Line Infection	<input type="checkbox"/> Intra-abdominal Infection <input type="checkbox"/> Surgical Site Infection	<input type="checkbox"/> Cellulitis <input type="checkbox"/> Meningitis <input type="checkbox"/> Other

Start Date:	DAY:	1	2	3	4	5	6	7
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
End Date:	DAY:	8	9	10	11	12	13	14
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

STICKERS/CODE: Green = Continue | Orange = Caution (see note) | Red = STOP (see note) | Black = De-Escalate (see note)



ICU Rounds Tool

SCORE	
APPROPRIATE: Score = 2. NEUTRAL: Score = 1. INAPPROPRIATE: Score = 0	
Initiation	
•• Drug choice(s) (for Indication)	
•• Regimen (Dose & Timing)	
Maintenance:	
•• Monitoring	
•• Appropriate De-Escalation	
•• Appropriate Termination	
Workup	
Cost-Efficacy	
TOTAL (Maximum 14)	

Provisional Results - “High Level” Antibiotics

Vancomycin
Aztreonam
Cefpirome
Ertapenem
Meropenem
Imipenem/cilastatin sodium
Piperacillin
Piperacillin/tazobactam
Quinupristin/dalfopristin
Teicoplanin
Linezolid

= 3% of all hospital admissions
= 7% of hospital admissions in which antibiotics are dispensed
= 53% of antibiotic costs in hospital

	2008	2009	% change
Antibiotic cost per event	R 5,424	R 6,581	21.34%
Antibiotic spend	R 78,709,922	R 101,336,664	28.75%
Average DDD per event per antibiotic	6.96	7.94	14.13%
Average DDD per event	9.37	10.75	14.74%
Total DDD	135,995	165,566	21.74%
Average LOS	9.66	9.55	-1.14%

Overlapping gram-negative cover

	2008	2009	% change
Event count	1,401	1,265	-9.71%
Incidence	0.28%	0.26%	-6.87%

Pip/tazo
Cefepime
Imipenem
Meropenem
Ertapenem
Ciprofloxacin
Levofloxacin

Overlapping gram-positive cover

	2008	2009	% change
Event count	1,009	1,208	19.72%
Incidence	0.20%	0.25%	23.48%

Linezolid
Teicoplanin
Vancomycin

Overlapping antifungal cover

	2008	2009	% change
Event count	1,128	1,310	16.13%
Incidence	0.22%	0.27%	19.78%

Multiple agents

Number of anti-biotics	Event count: 2008	Event count: 2009	% change	Incidence: 2008	Incidence: 2009	% change
2 or more	4,681	5,199	11.07%	0.93%	1.06%	14.55%
3 or more	1,885	2,212	17.35%	0.37%	0.45%	21.03%
4 or more	924	1,056	14.29%	0.18%	0.22%	17.87%
5 or more	443	523	18.06%	0.09%	0.11%	21.77%
6 or more	213	234	9.86%	0.04%	0.05%	13.31%

Provisional Results – “Workup”

Pathology Codes representing microbiological investigations that guide prescribing of antibiotics

Pus	3867 Miscellaneous (body fluids, urine, exudate, fungi, pus, scrapings, etc) 3895 Bacteriological culture: Fastidious organisms 3909 Anaerobe culture: Limited procedure 3901 Fungal culture
Urine	3867 Miscellaneous (body fluids, urine, exudate, fungi, pus, scrapings, etc) 3893 Bacteriological culture: Miscellaneous 3922 Viable cell count 3928 Antimicrobial substances 4188 Urine dipstick, per stick (irrespective of the number of tests on stick)
Sputum	3867 Miscellaneous (body fluids, urine, exudate, fungi, pus, scrapings, etc) 3895 Bacteriological culture: Fastidious organisms 3885 Cytochemical stain
ID Sensitivity	3923 Biochemical identification of bacterium: Abridged 3925 Serological identification of bacterium: Abridged 3926 Serological identification of bacterium: Extended 3927 Grouping for streptococci 4652 Rapid automated bacterial identification per organism 3887 Antibiotic susceptibility test: per organism 4653 Rapid automated antibiotic susceptibility per organism
Blood culture	3891 Blood culture: Aerobic 3892 Blood culture: Anaerobic 3893 Bacteriological culture: Miscellaneous 3894 Radiometric blood culture 3895 Bacteriological culture: Fastidious organisms 3896 In vivo culture: Bacteria 3897 In vivo culture: Virus 3898 Bacteriological exotoxin production (in vitro assay) 3899 bacteriological exotoxin production (in vivo assay) 3901 Fungal culture 3902 Clostridium difficile (cytotoxicity neutralisation) 3903 Antibiotic level: Biological fluids 3907 Culture for staphylococcus aureus 3908 Anaerobe culture: Comprehensive 3909 Anaerobe culture: Limited procedure 3911 Beta-lactamase assay 3914 Sterility control test: Biological method 3919 Identification of mycobacterium

Pathology codes

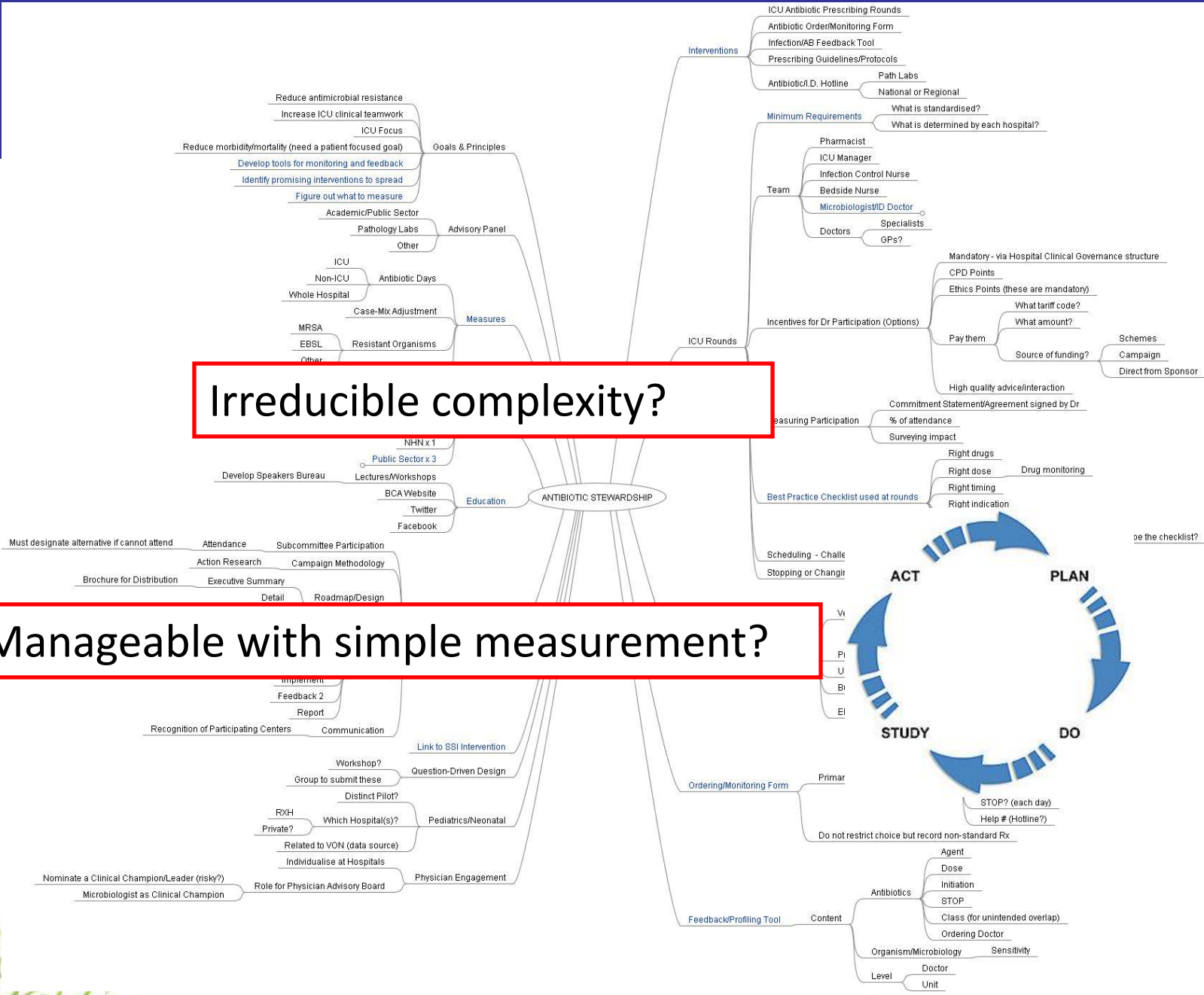
+

Vancomycin
Aztreonam
Cefpirome
Ertapenem
Meropenem
Imipenem/cilastatin sodium
Piperacillin
Piperacillin/tazobactam
Quinupristin/dalfopristin
Teicoplanin
Linezolid

= 0 ???

Irreducible complexity?

or...Manageable with simple measurement?



Always

Summary

- Best Care...Always! is an inclusive national patient safety and quality improvement initiative
- Initial focus is hospitals, and mainly ICUs
- Antibiotic stewardship is integrated with 4 infection prevention interventions
- BCA uses a campaign approach, promoting evidence-based, pragmatic, data-driven improvement cycles
- BCA incorporates multiple stakeholders, mainly using existing organisational structures
- Long term vision is to create a sustainable vector for collaboration and improvement in the health sector



Please Join (Partner) Us...



The banner features the Bestcare logo on the left, a central image of healthcare professionals, and a navigation menu at the bottom. A white box in the center contains the website URL.

Bestcare
Always!

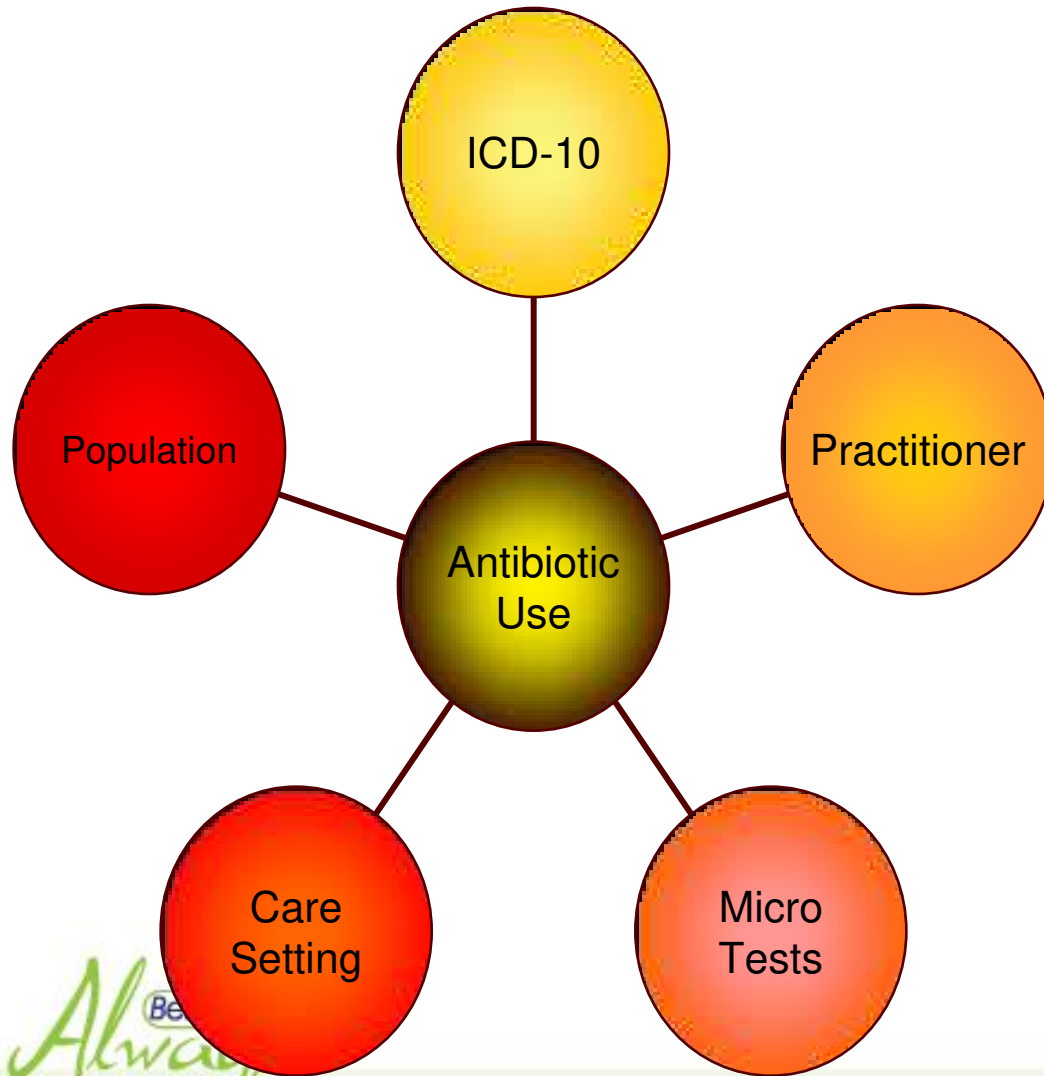
<http://www.bestcare.org.za>

A collaborative quality initiative for consistent best practice and patient safety

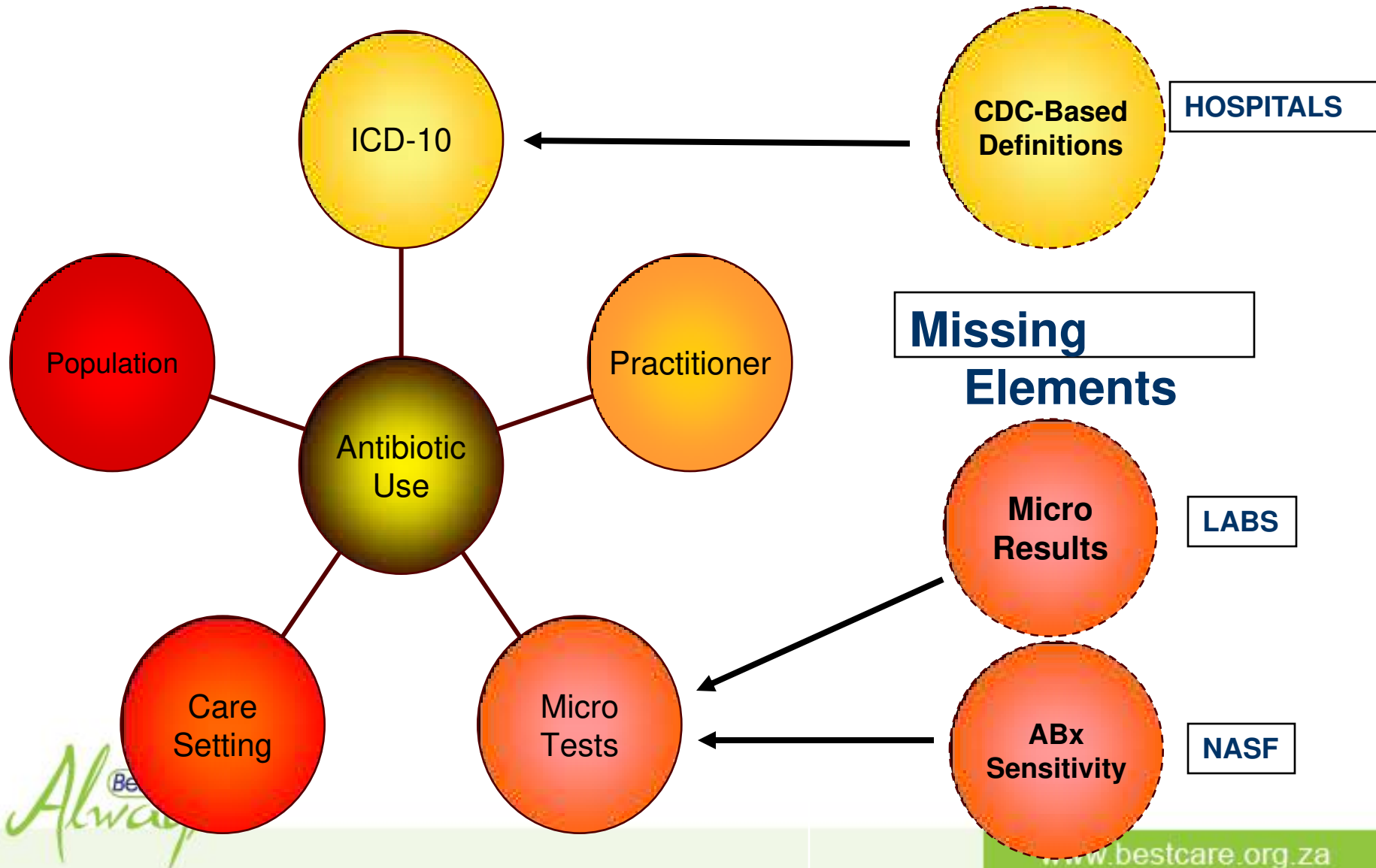
About us | Interventions | How to join | News and events | Links | Promote BCA | Contact us

- info@bestcare.org.za
- Chair: Dr Dena van den Bergh 082 451 2284
- Spokesperson: Dr Gary Kantor 076 120 7560

Antibiotic Use Analysis: Claims Data



Antibiotic Use Analysis: Claims Data



Potential Routine Analyses/Markers

- Current antibiotic utilization, and trends
 - Rates per 1000 population; ambulatory care visits; admissions
 - DRG-specific; hospital-specific; agent-specific utilization
- Surgical prophylaxis
 - Procedure-specific antibiotic choice, dosing, duration, timing
- Guideline adherence
 - Community-acquired pneumonia, UTI, etc
- “Blind” therapy without appropriate culture
- Infection rates (“HAI”)
 - Rate of antibiotic-resistant infection

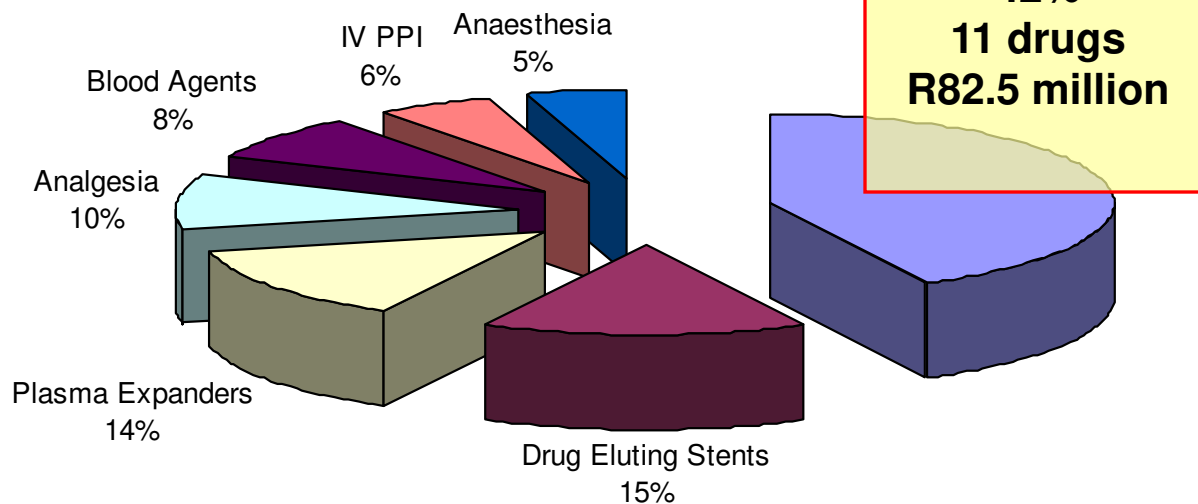


High Level Antibiotics (HLA)

- Total antibiotic spend (2007) = R327 million
 - IH R125 million
 - OH R202 million
- HLA = 64% of total IH antibiotic spend
- Average antibiotic spend for a hospital “event”:
 - HCA event R4,600
 - Meropenem R2,100
 - Targocid R8,320
 - Lower cost antibiotic event R200
- 2008 HCA spend 13% higher than 2007

High Level Antibiotics

Top 40 Ethical Products (2007) = R206m



ANTIBIOTICS
42%
11 drugs
R82.5 million

- Avelon
- Ciprobay
- Invanz
- Kefzol
- Maxipime
- Meronem
- Targocid
- Tavanic
- Tazobax
- Tazocin
- Tienam

Antibiotic Overuse & Misuse

- Broad spectrum, high cost antibiotics
 - Misuse of an **expensive** and **precious** resource
 - Clinicians are **afraid to “scrimp”** – justifiably
 - e.g. Vancomycin used routinely for **ophthalmology prophylaxis**
- Empiric use without microbiological confirmation
 - 44% of hospital admissions in which therapeutic antibiotics (> 48 hrs in hospital, continued for > 24 hrs) were prescribed had **no claims for microbiology**

Antibiotic Overuse & Misuse

- Lack of compliance with established guidelines
 - Ceftriaxone is commonly (45%) used to treat paediatric community-acquired pneumonia - **contrary to SA guidelines**
- Excessive use of antibiotic combinations
 - 5% used **3 or more antibiotic classes** to treat community-acquired pneumonia
- Surgical prophylaxis (inappropriate choice/timing)
 - HLA events **22% have LOS < 2 days**
 - Excessive duration of prophylaxis (>24 hrs)
- Antibiotics for viral infection
 - **31%** of patients with “acute nasopharyngitis” (**common cold**)
 - **79%** of patients with “acute pharyngitis”

Antibiotics for Acute Respiratory Infection?

- “For your infection, there is a
 - 1 in 4000 chance that an antibiotic will prevent a serious complication
 - 5% - 25% chance that it will cause diarrhea
 - 1 in 1000 chance that you will require a visit to the emergency department because of a bad reaction to the antibiotic”

Source: Clin Inf Dis 2008; 47:744-6