GADSA

Gamified Antimicrobial Stewardship (AMS) decision support app for prescribing behaviour change

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Aim

Improve antibiotic stewardship in Nigeria through sustained behaviour change by developing a mobile **gamified AMS decision support app** (GADSA) localised for two settings

- College of Medicine of the University of Lagos - affiliated to the national Lagos University Teaching Hospital (LUTH)
- Regional Obafemi Awolowo University Hospital

Background

- Population: 182m people
- States: 36 +1
- Local Governments: 774

  Three tiers of Health
  - Tertiary
  - Secondary
  - Primary

  The Budget of the Health sector is 250Bn naira ($500-700m). 3.8%

Lagos University Teaching Hospital

- A 761 bed hospital
- Employees: 4,000
- Physicians: 425 active medical staff
- Population of catchment area: 20m
- In-patient admissions – av 25,000/year
- Outpatient visits- >400,000/year

OAUTHC
Obafemi Awolowo University Hospital

A. AMS Research Questions and Objectives:

"Does a gamified mobile app supporting decision making improve antibiotic stewardship in teaching hospital and regional settings in Nigeria?“

- Priorities: surgical side infections
- Correct assessments of High and Low Risk surgeries
- Correct prescription of antimicrobials according to WHO guidelines
- Audit of current practice at the point of care
- Measure behaviour change during evaluation period

B. Technical Research Questions and Objectives

"Does 'co-authoring' and 'localisation' in development of a *gamified AMS decision support app* involving end users lead to better engagement and uptake?"

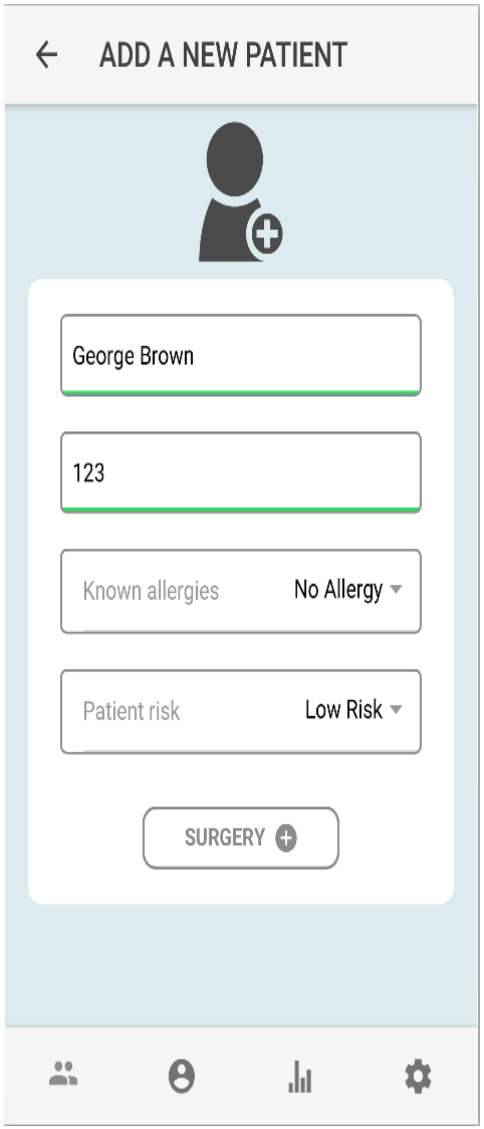
- Gamified mobile app for AMS decision support 'co -authored' with the Nigerian partners
- Persuasive serious games tools implementing behaviour-change methods
- Assessment of chat BC methods and persuasive tools are the most effective in enabling higher compliance with AMR guidelines

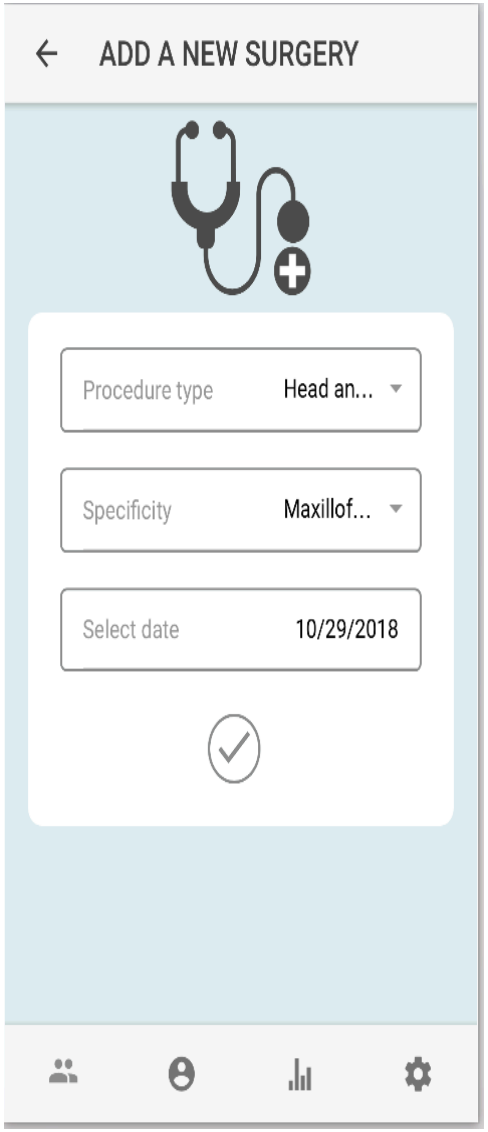
International Resource for Infection Control (iNRIC)

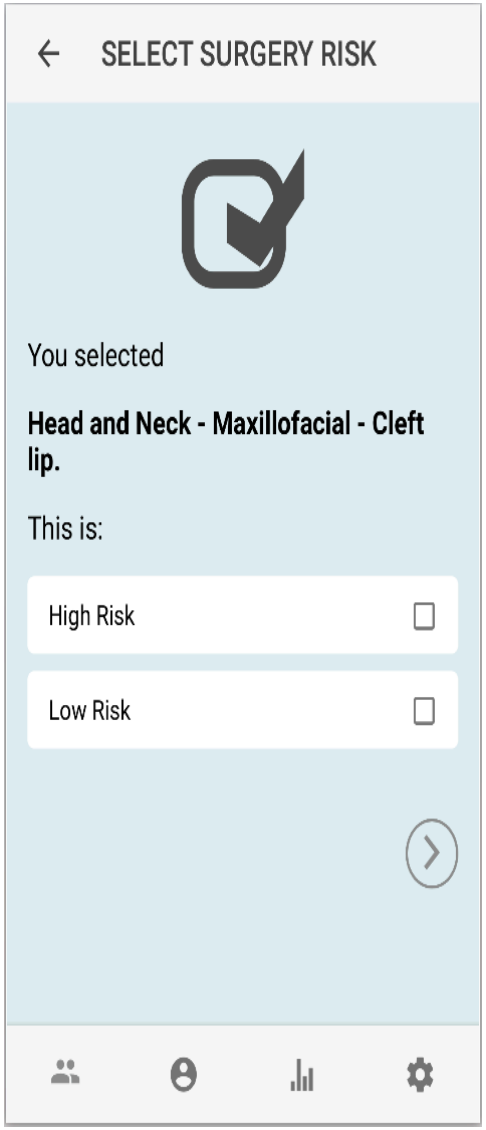
- **online resource for infection control** (www.nric.org.uk) providing best available quality-assured evidence
- **African iNRIC - Dissemination of African guidelines**
- **a quarter of a million users for 159 different countries** and ranking in **Top 10 in Google searches** for infection-related terms
- endorsed by **key stakeholders in infection prevention and control** in the UK (IPS, RCN, HPA, DH, NHS Scotland) as well international organizations such as WHO, ECDC and IFIC.

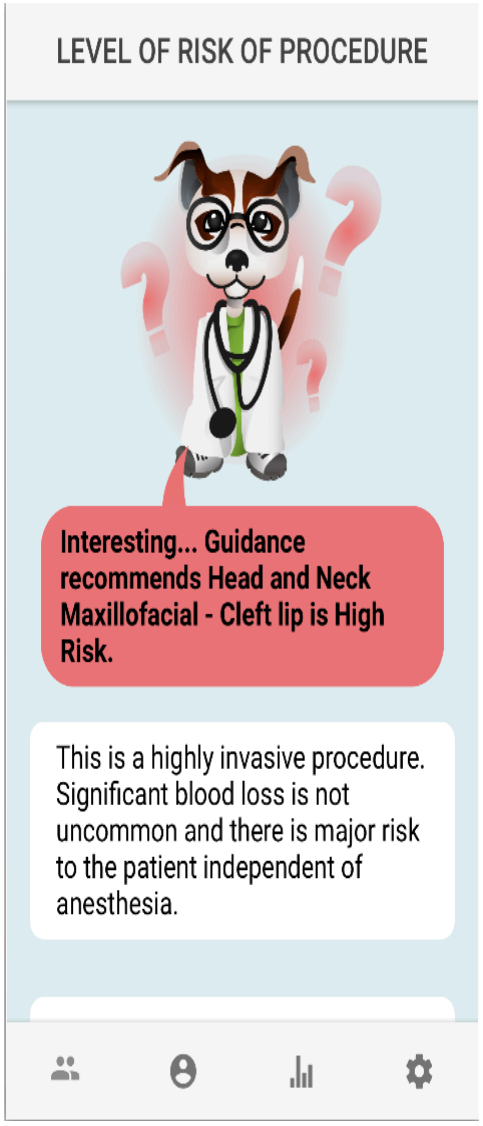
GADSA Methods and Process

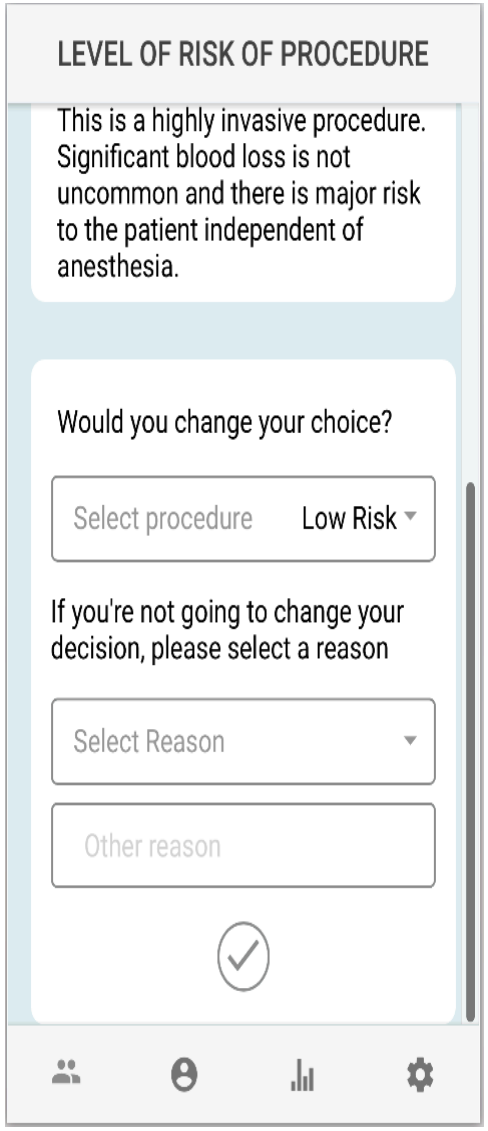
1. **Conduct** behaviour situation analysis assessing antimicrobial prescription practise and existing barriers
2. **Collate AMS policies** from WHO and local settings and disseminate them on iNRIC
3. **Develop co-authored persuasive game app** enabling behaviour change and compliance
4. **Collect 4 data sources**: BC situational survey, hospital prescription data, app logs data during evaluation period, focus groups qualitative data
5. **Evaluate Behaviour Change during evaluation period**

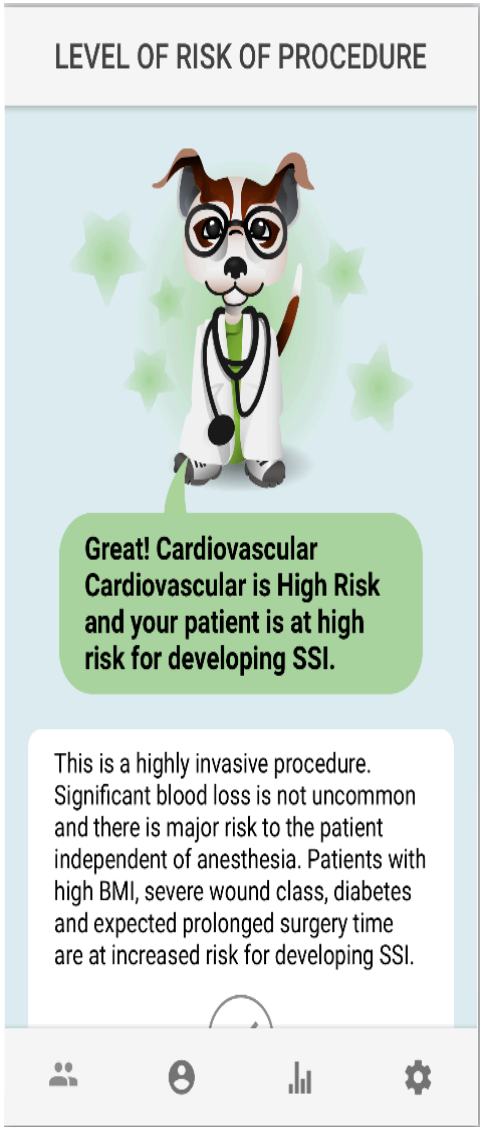

ADD A NEW PATIENT
George Brown
123
Known allergies
No Allergy
Patient risk
Low Risk
SURGERY

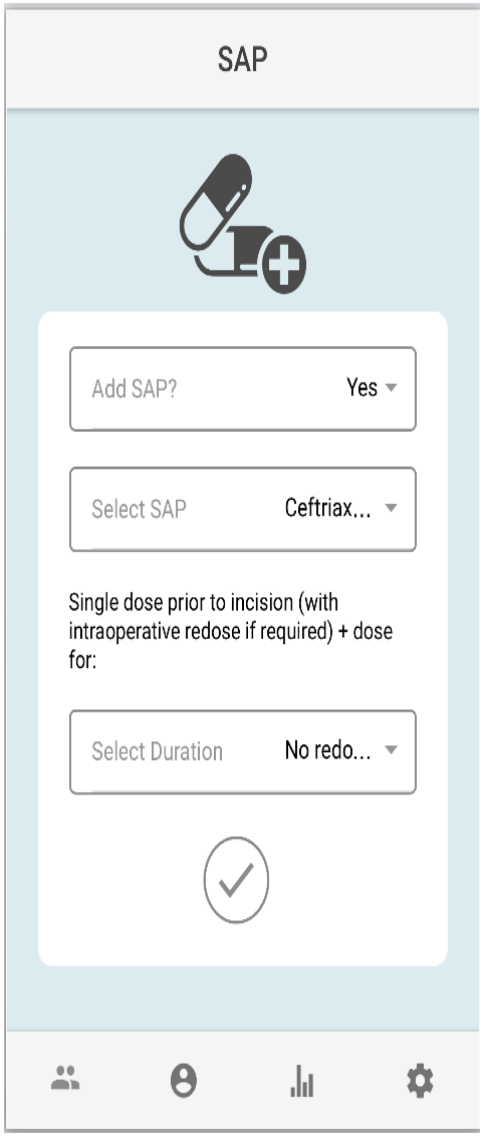

ADD A NEW SURGERY
Procedure type
Head an...
Specificity
Maxillof...
Select date
10/29/2018


SELECT SURGERY RISK
You selected
Head and Neck - Maxillofacial - Cleft lip.
This is:
High Risk
Low Risk


LEVEL OF RISK OF PROCEDURE
Interesting... Guidance recommends Head and Neck Maxillofacial - Cleft lip is High Risk.
This is a highly invasive procedure. Significant blood loss is not uncommon and there is major risk to the patient independent of anesthesia.


LEVEL OF RISK OF PROCEDURE
This is a highly invasive procedure. Significant blood loss is not uncommon and there is major risk to the patient independent of anesthesia.
Would you change your choice?
Select procedure
Low Risk
If you're not going to change your decision, please select a reason
Select Reason
Other reason


LEVEL OF RISK OF PROCEDURE
Great! Cardiovascular Cardiovascular is High Risk and your patient is at high risk for developing SSI.
This is a highly invasive procedure. Significant blood loss is not uncommon and there is major risk to the patient independent of anesthesia. Patients with high BMI, severe wound class, diabetes and expected prolonged surgery time are at increased risk for developing SSI.


SAP
Add SAP?
Yes
Select SAP
Ceftriax...
Single dose prior to incision (with intraoperative redose if required) + dose for:
Select Duration
No redo...

PRESCRIPTION OF SAP

Not sure... Ceftriaxone/2gm is not recommended by the guidance in this particular case for patients undergoing Head and Neck - Maxillofacial - Cleft lip. Your decision to administer single dose prior to incision plus no redose after post-op is in line with recommendations.

A different SAP is recommended for this type of procedure. The misuse and overuse of antimicrobials is accelerating

PRESCRIPTION OF SAP

the spread of antimicrobial resistance (AMR).

List of SAP recommended here:
Cefazolin/2gm, Cefazolin/2gm + Metronidazole/500mg, Cefuroxime/1.5gm + Metronidazole/500mg, Amphicillin-Sulbactam/3gm

Would you change your choice?

Add SAP? Yes

Select SAP Ceftriaxon...

Select Duration No redose...

If you're not going to change your decision, please select a reason:

Select Reason

PRESCRIPTION OF SAP

Sulbactam/3gm

Would you change your choice?

Add SAP? Yes

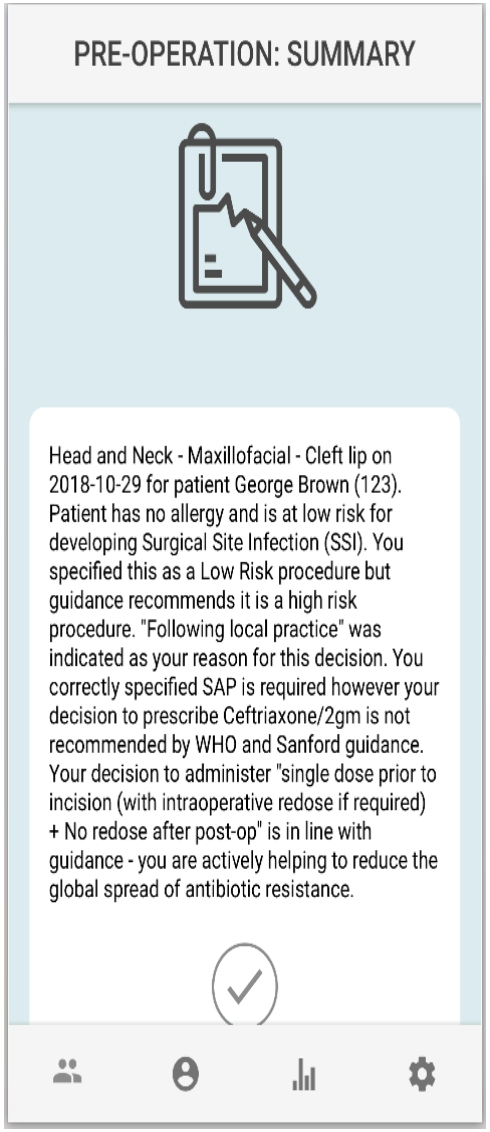
Select SAP Ceftriaxon...

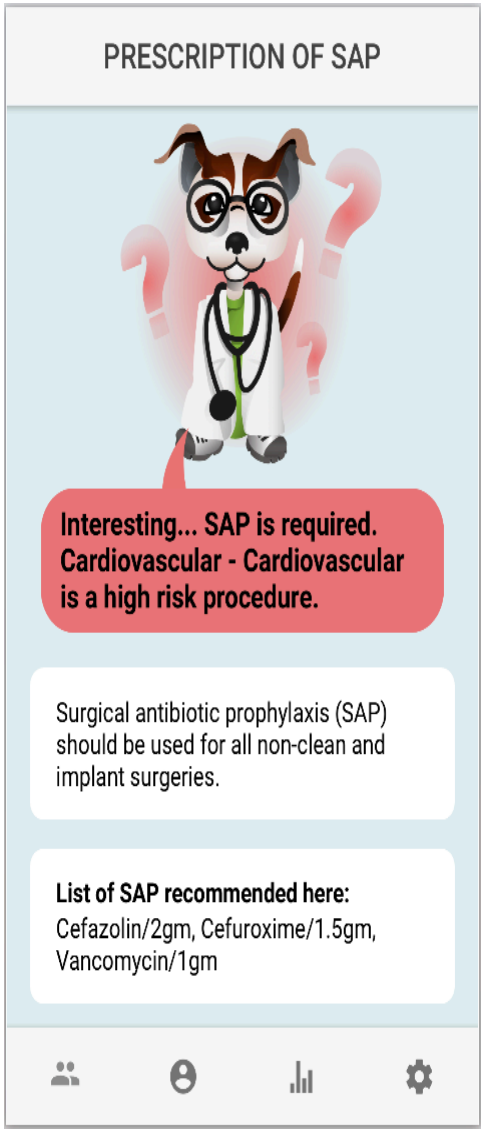
Select Duration No redose...

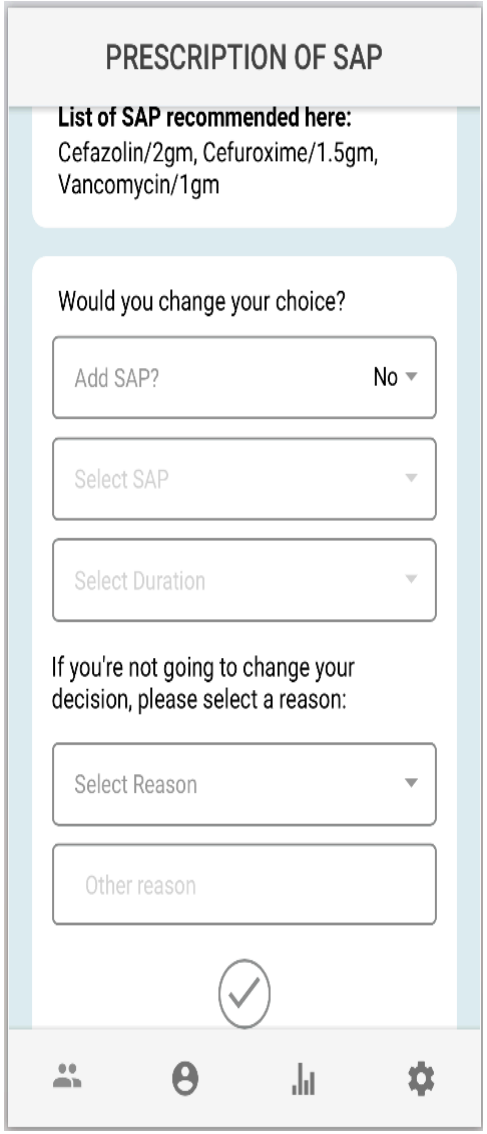
If you're not going to change your decision, please select a reason:

Select Reason Following ...

Other reason


PRE-OPERATION: SUMMARY
Head and Neck - Maxillofacial - Cleft lip on 2018-10-29 for patient George Brown (123). Patient has no allergy and is at low risk for developing Surgical Site Infection (SSI). You specified this as a Low Risk procedure but guidance recommends it is a high risk procedure. "Following local practice" was indicated as your reason for this decision. You correctly specified SAP is required however your decision to prescribe Ceftriaxone/2gm is not recommended by WHO and Sanford guidance. Your decision to administer "single dose prior to incision (with intraoperative redose if required) + No redose after post-op" is in line with guidance - you are actively helping to reduce the global spread of antibiotic resistance.


PRESCRIPTION OF SAP
Interesting... SAP is required. Cardiovascular - Cardiovascular is a high risk procedure.
Surgical antibiotic prophylaxis (SAP) should be used for all non-clean and implant surgeries.
List of SAP recommended here:
Cefazolin/2gm, Cefuroxime/1.5gm, Vancomycin/1gm


PRESCRIPTION OF SAP
List of SAP recommended here:
Cefazolin/2gm, Cefuroxime/1.5gm, Vancomycin/1gm
Would you change your choice?
Add SAP?
No
Select SAP
Select Duration
If you're not going to change your decision, please select a reason:
Select Reason
Other reason

Decision Tree – WHO guidelines and Sanford Guide

EXAMPLE: IF 'Colorectal surgery' selected..***

Does the patient have a Beta Lactum allergy?

IF NO: Suggest Cefazolin 1-2gm IV + metronidazole 0.5gm IV **or** Cefoxitin **or** Cefotetan 1-2 gm IV **or** Ceftriaxone 2 gm IV + Metro 0.5 gm IV **or** ERTA 1 gm IV

IF YES: Suggest Clindamycin 900 mg IV + (Gentamicin 5mg/ kg **or** Aztreonam 2 g IV **or** Ciprofloxacin 400mg IV)

IF 'Head and Neck Surgery' selected..***

Is the procedure considered high risk? i.e. high likelihood of unclean, contaminated surgery

IF NO: Low risk surgery does not require prophylaxis

IF YES: Suggest Cefazolin 2 gm IV (Single dose) (some add metronidazole 500 mg IV) **OR** Clindamycin 600-900 mg IV (single dose) ± gentamicin 5 mg/kg IV (single dose). Re-dose cefazolin q4h if CrCl>30 mL/min or q8h if CrCl<30 mL/min

IF 'Breast surgery OR herniorrhaphy' selected..***

Is the patient >90kg ?

IF NO: Suggest Cefazolin 1-2 gm IV x 1 dose **or** Ampicillin sulbactam 3gm IV x 1 dose **or** Cllndamycin 900 mg IV x 1 dose **or** Vancomycin 1gm IV x 1 dose

IF YES: Suggest use Vancomycin 1 .5 gm IV

Data Collection & Evaluation

Following datasets will be used:

- Prescription rates in both settings (anonymised hospital level data before, throughout intervention) if possible
- Patient condition/invasive devices will be recorded in the app for appropriate prescription decision support
- App logs collected by the app to indicate usage, analytics
- Post-evaluation survey & structured interview

Evaluation (early 2019)

- in 2 settings over 2 months with 60+ surgeons

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