Fra aseptisk til ansvarligt

En ny tilgang til kirurgisk praksis

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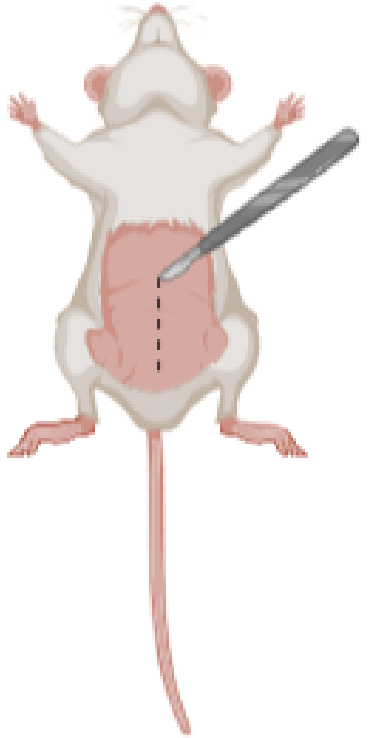
Aseptiske teknikker anvendes sjældent i gnaverkirurgi – men bør de?

- Udfordringer
  - Besværligt
  - Dyrt
  - Tids- og ressourcekrævende
  - Højere miljøbelastning
  - Hurtig vævsgeneration og et effektivt immunrespons
  - Uden synlig effekt på overlevelse

Survival alone is not the goal!



Manglende asepsis kan kompromittere både dyrevelfærd og datakvalitet

- Subkliniske infektioner
  - Lokal inflammation eller systemisk cytokinrespons
  - Ændring i
    - Immunstatus
    - Metabolisme
  - Dyrevelfærdsmæssige udfordringer
    - Smerte, hævelse og ubehag ved operationsstedet
    - Forlænget helingsperiode
    - Nedsat trivsel eller vægttab

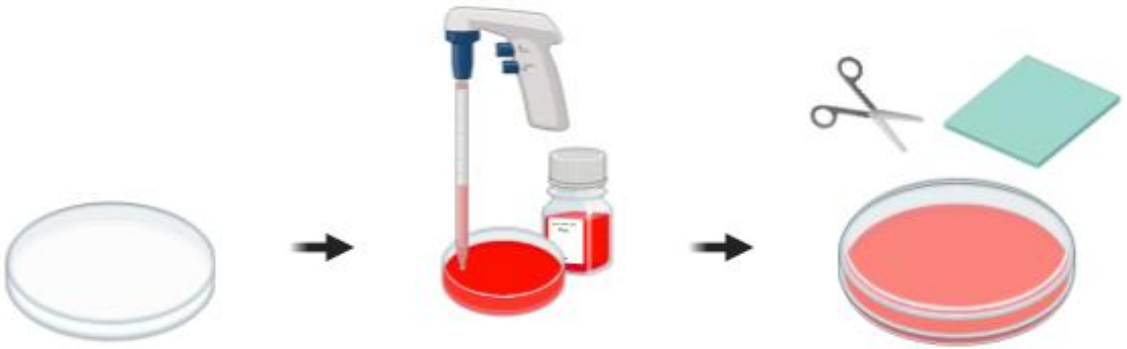
Behov for et praktisk og effektivt rent regime i gnaverkirurgi

- Fuld aseptik er ofte urealistisk i gnaverkirurgi
- Målet er et praktisk kompromis: **høj renhed**, **lav kompleksitet**

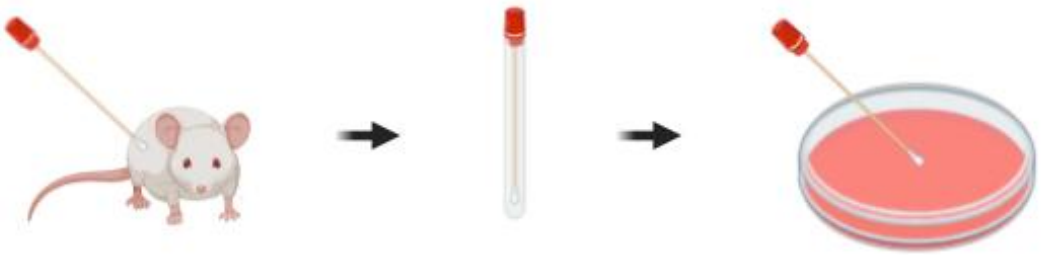
Praktisk aseptik = ren nok til at beskytte dyret, enkel nok til at blive fulgt

Agarpladem odel som simuleret kirurgisk setup

Preparation of agar model



Inoculation of agar model with tracer bacteria

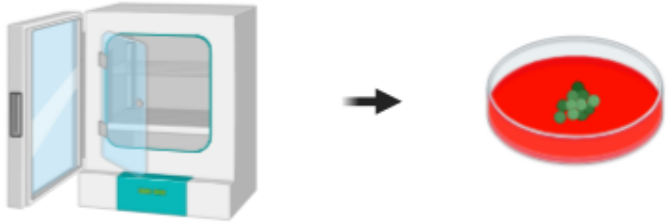


Regimes used during surgery

Aseptic (A)	Tip-only Aseptic (T)	Dirty (D)

Surgical procedure

Incubation and evaluation of growth



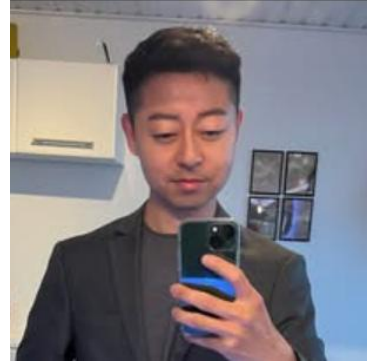
Tre kirurgiske regimer: Aseptisk, Rent (tip-only) og Dirty

Aseptic	Tip-only	Dirty
🧴 Alcohol clean	🧴 Alcohol clean	💧 Tap water cleaning
🧤 Sterile gloves	🧤 Non-sterile gloves	🖐️ Same gloves reused
🔥 Autoclaved tools	🔥 Hot-bead sterilized	💧 Soap and water
🧍 Gown, mask + hairnet	😷 Mask + hairnet	🚫 None

Kan et rent regime give samme bakterielle kontrol som fuld aseptik?

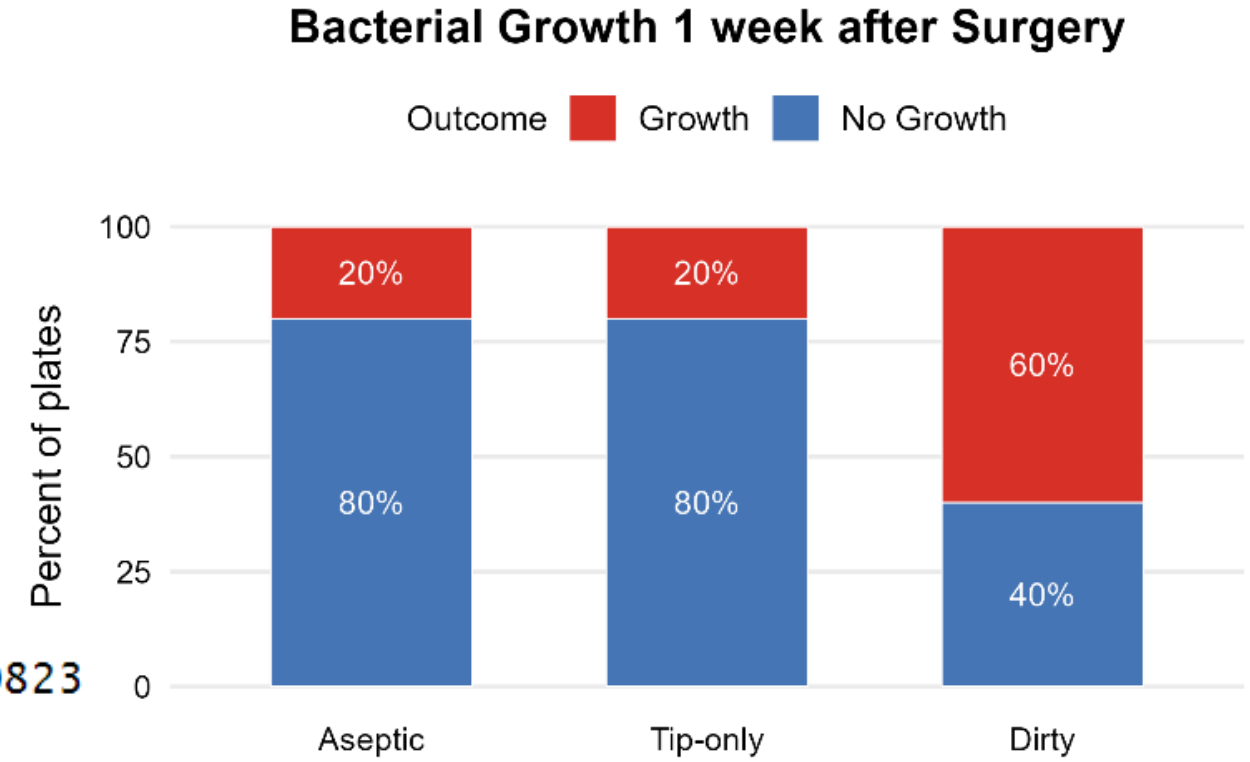
Hypotesen er, at når der udføres kirurgi på en agarpladem odel, vil

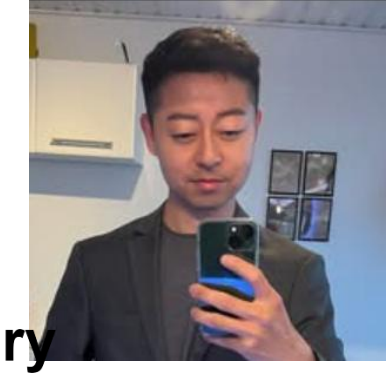
1. Den postoperative bakterievækst være signifikant reduceret ved anvendelse af aseptiske teknikker sammenlignet med ikke-aseptiske teknikker, og
2. Det **tip-only** aseptiske regime vil være sammenligneligt med det klassiske aseptiske regime



Aseptic vs Tip-only vs Dirty

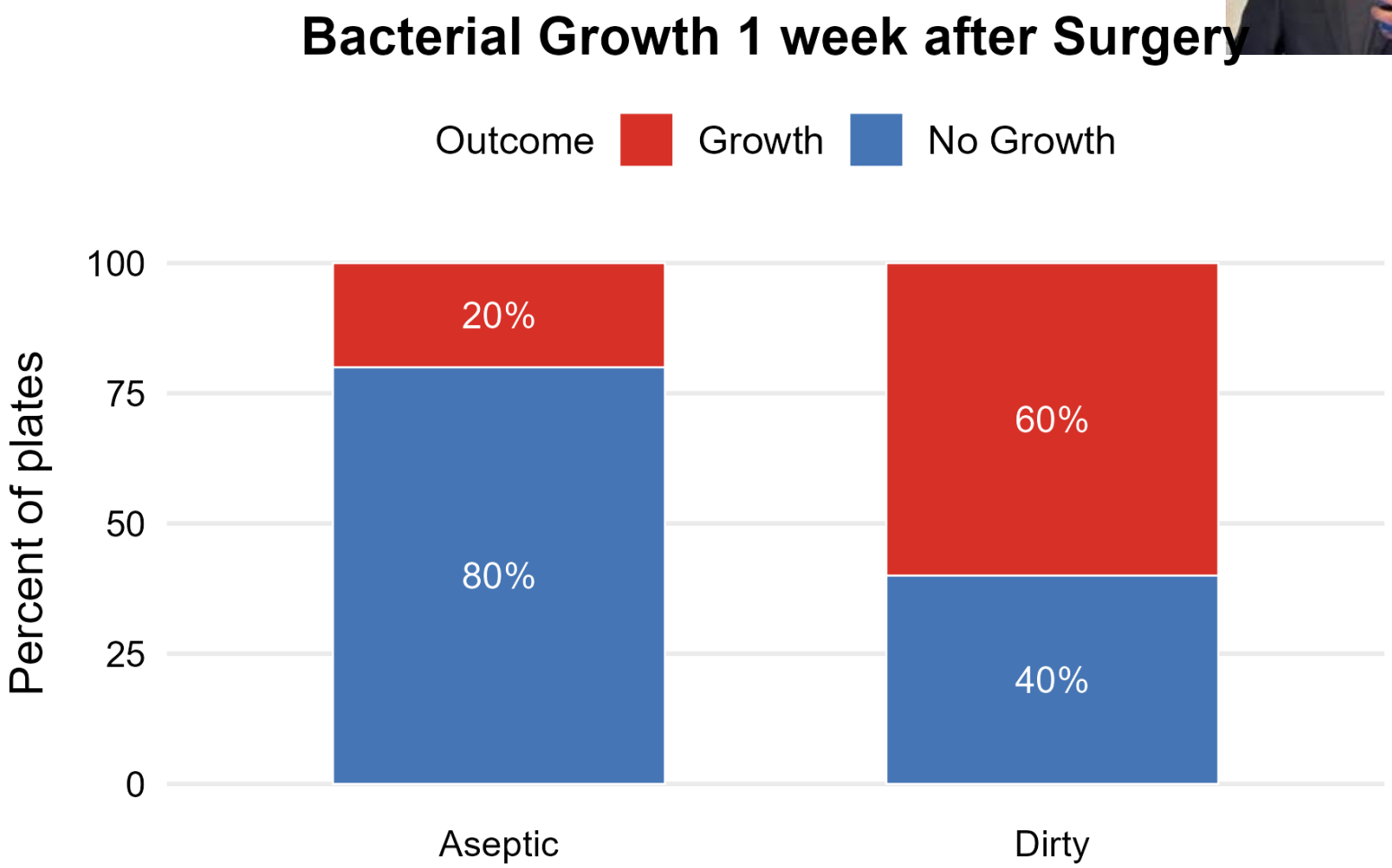
```
          G NG
Aseptic   4 16
Tip-only  4 16
Dirty    12  8

        Pearson's Chi-squared test

data:  table
X-squared = 9.6, df = 2, p-value = 0.00823
```

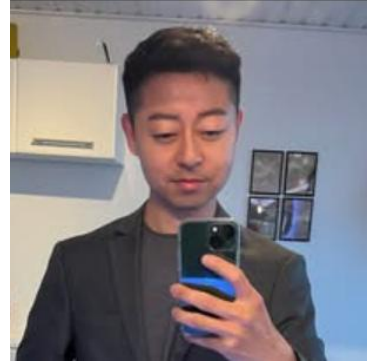




Aseptic vs Dirty

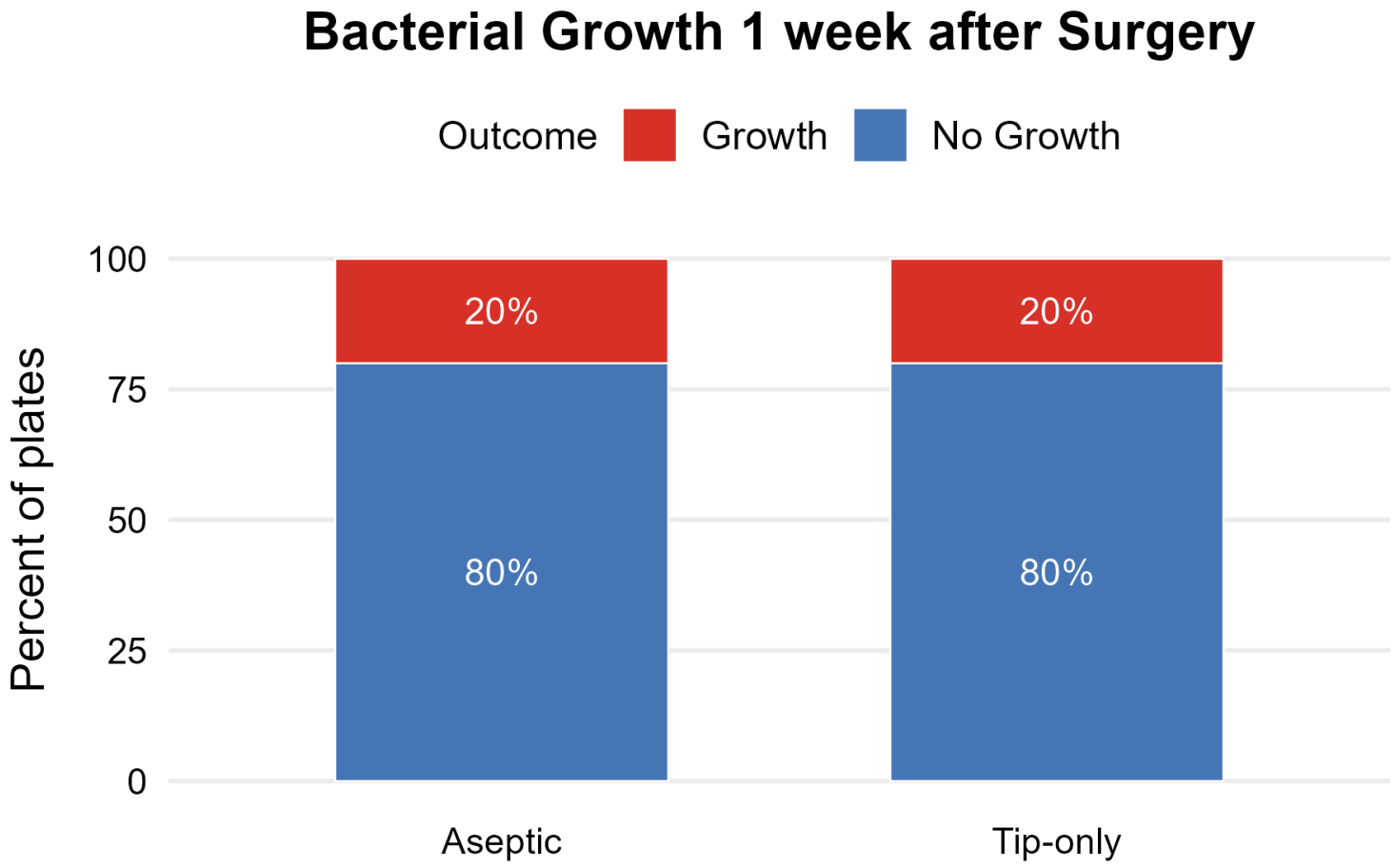
```
          G NG
Aseptic   4 16
Dirty    12  8

        Fisher's Exact Test

data:  table
p-value = 0.02248
```



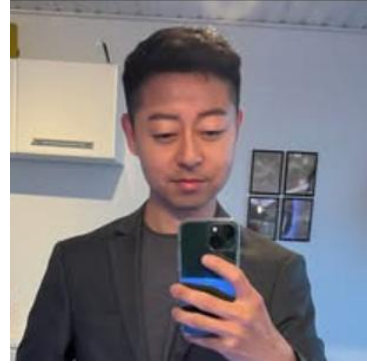


Aseptic vs Tip-only

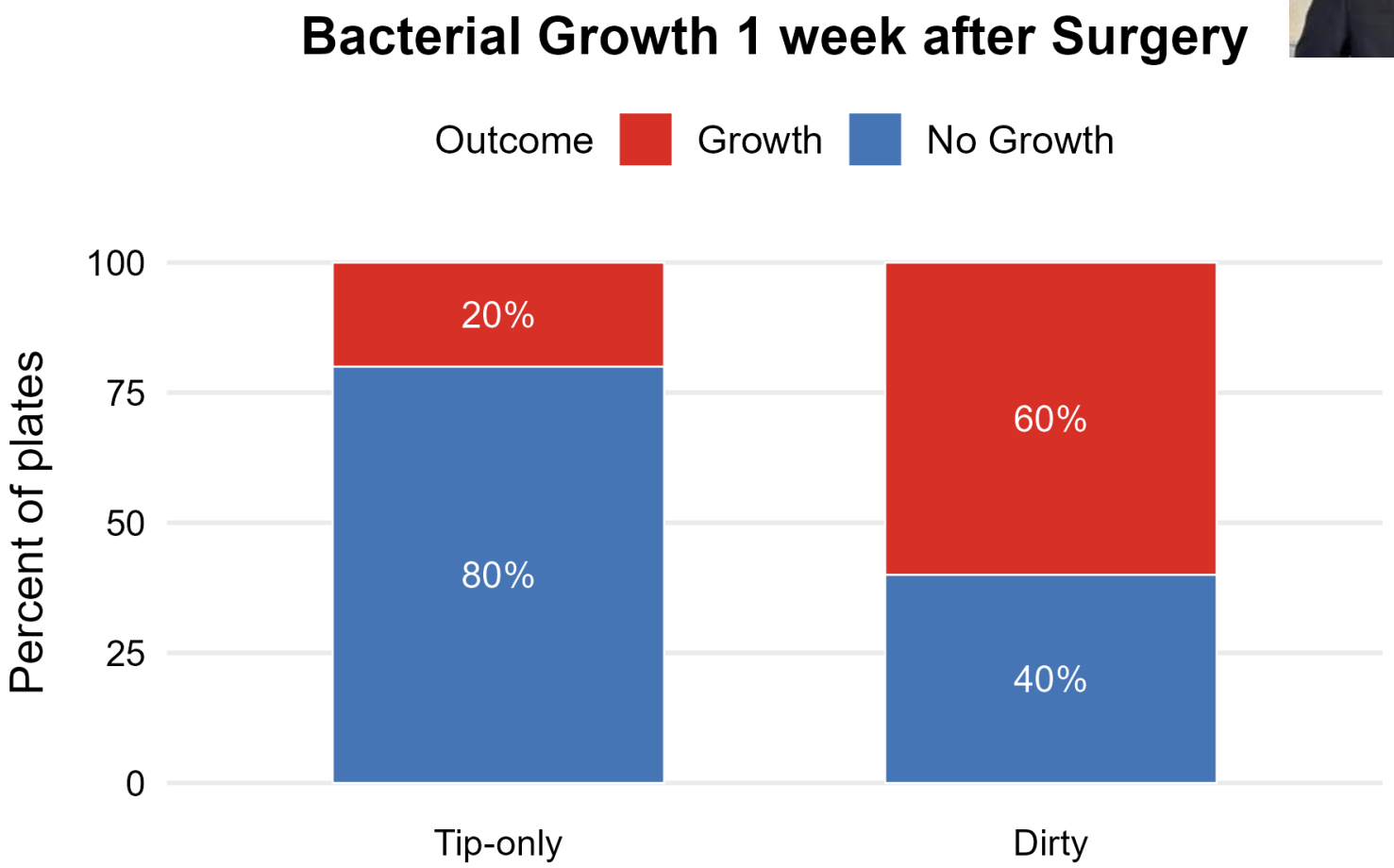
```
          G NG
Aseptic   4 16
Tip-only  4 16

        Fisher's Exact Test

data:  table
p-value = 1
```



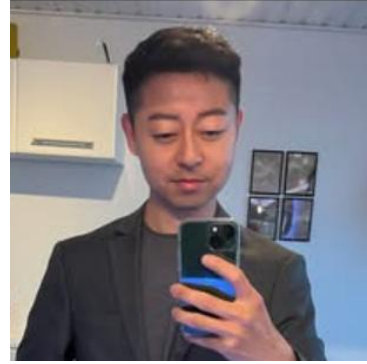
Tip-only vs Dirty



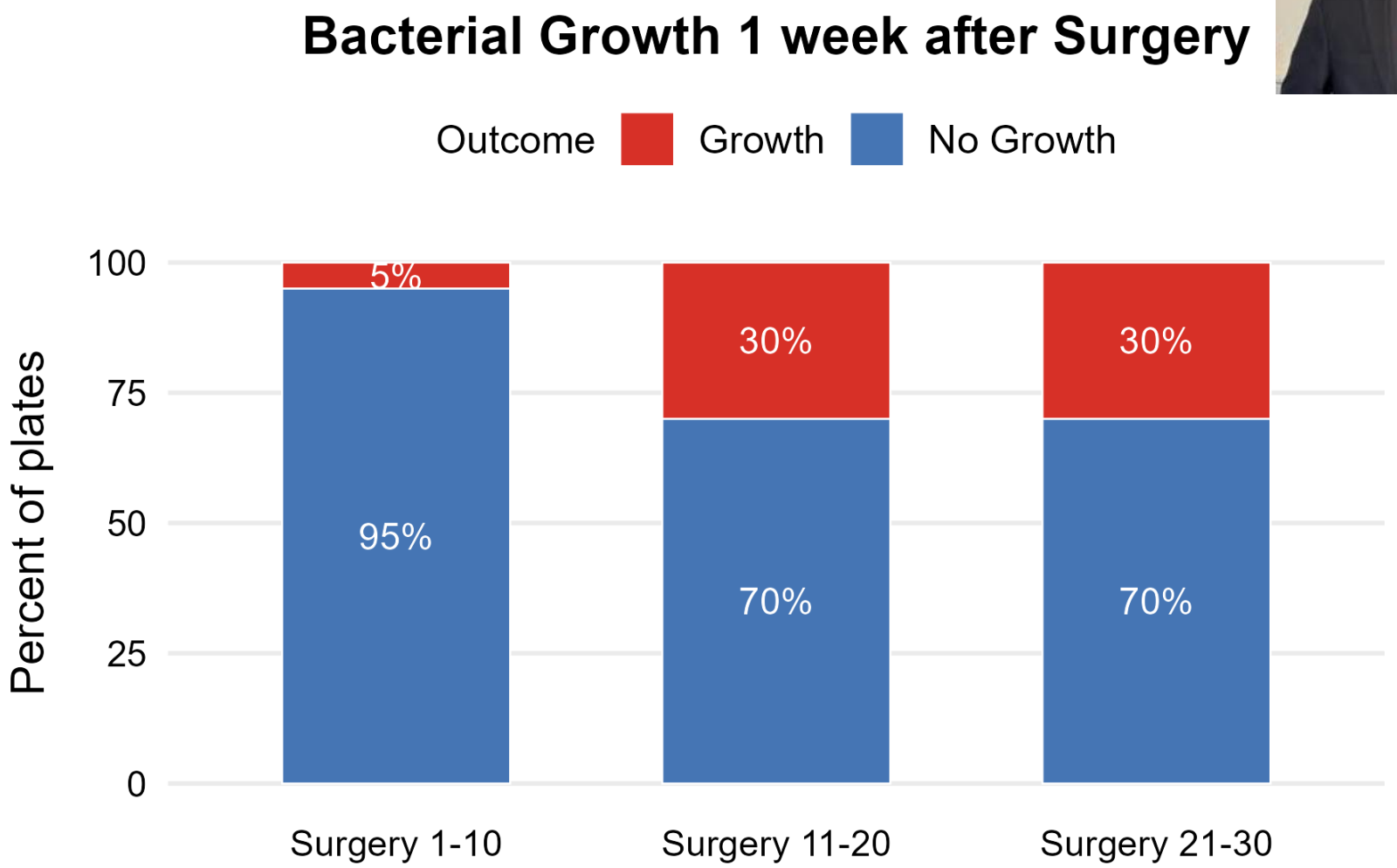
```
           G NG
Tip-only   4 16
Dirty     12  8

        Fisher's Exact Test

data:  table
p-value = 0.02248
```



Tip-only 3x10



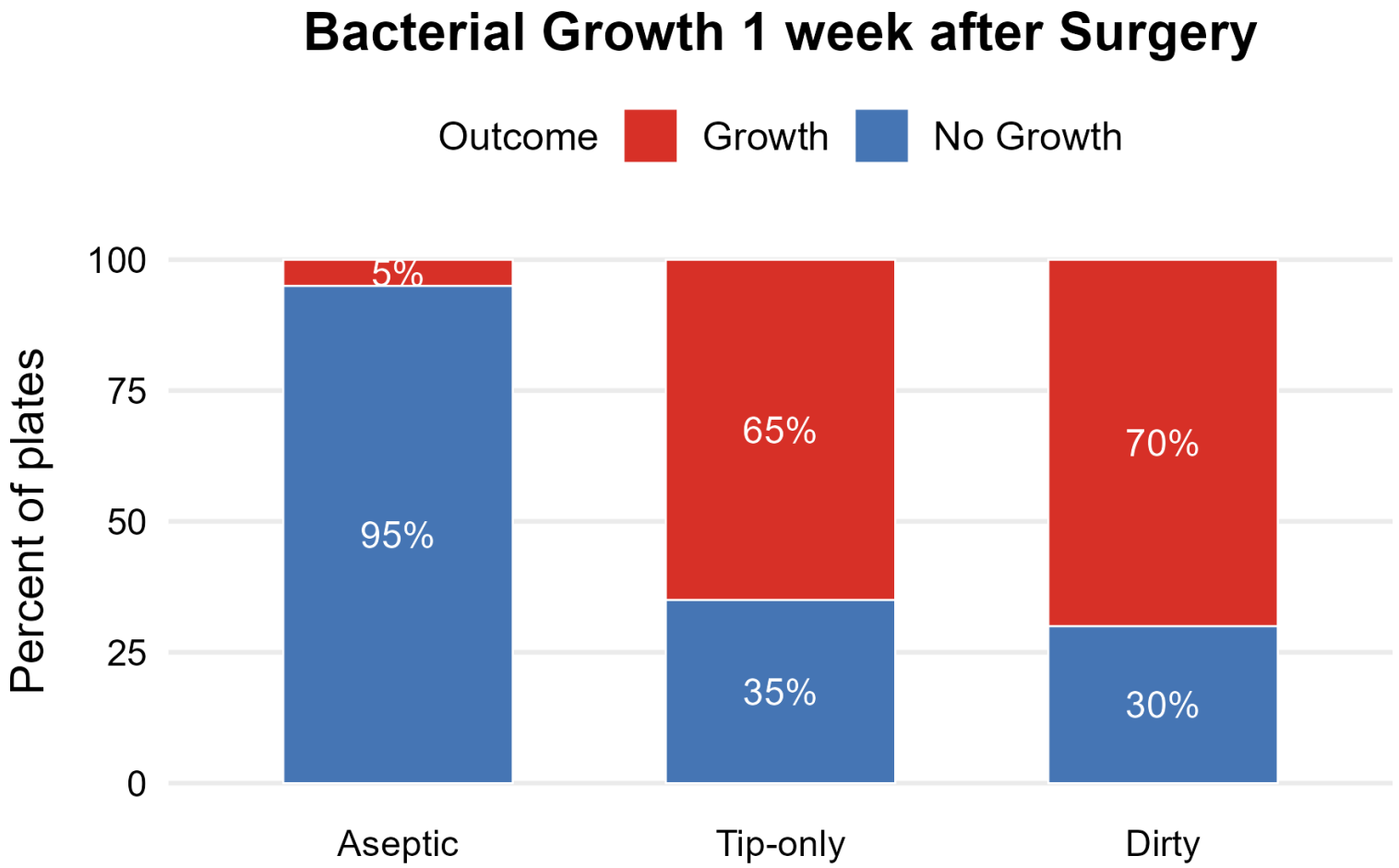
```
                G NG
Surgery 1-10    1 19
Surgery 11-20   6 14
Surgery 21-30   6 14

        Fisher's Exact Test

data:  table
p-value = 0.107
```



DELKONKLUSION

- Der er ingen statistisk signifikante forskelle mellem den aseptiske og **tip-only** regimet, og begge teknikker er statistisk overlegne i forhold til det **dirty** regime.
- **Tip-only** Regimet er pålideligt over tid, dog synes det, at jo flere operationer der udføres, desto mindre pålidelig bliver **tip-only** regimet.

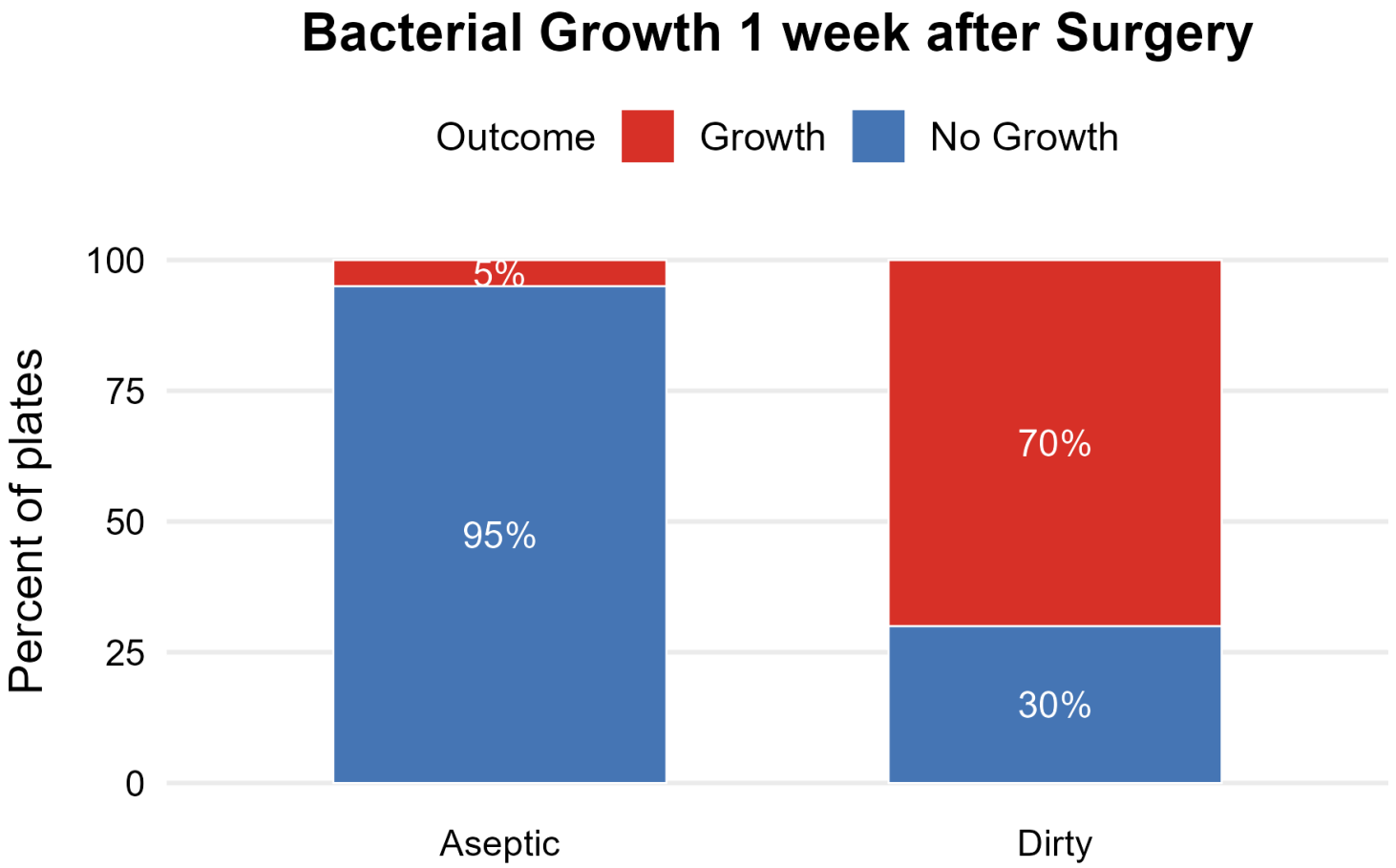
Aseptic vs Tip-only vs Dirty




```
           G NG
Aseptic    1 19
Tip-only 13  7
Dirty    14  6

        Pearson's Chi-squared test

data:  table
X-squared = 21.027, df = 2, p-value = 2.717e-05
```

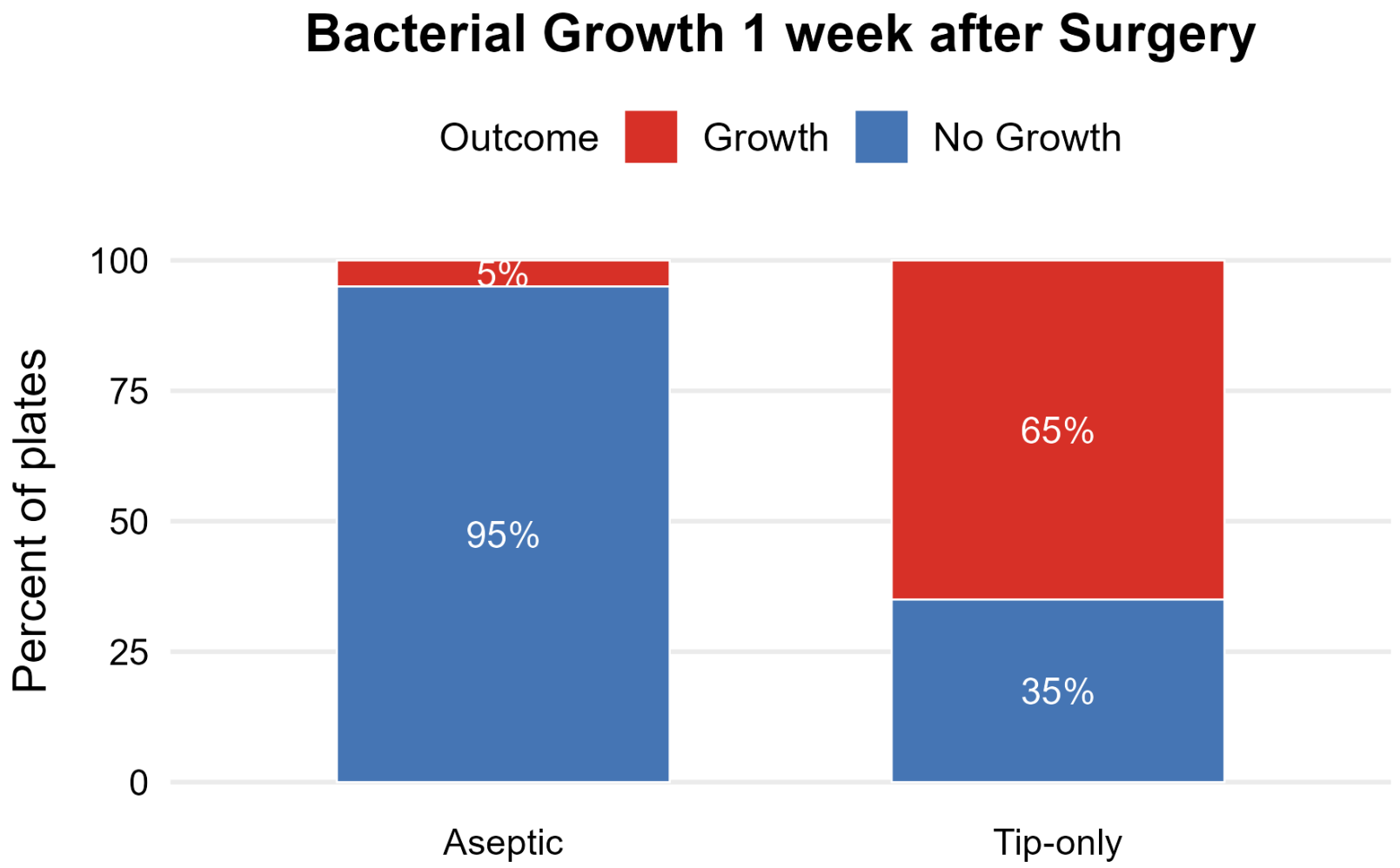
Aseptic vs Dirty

```
          G NG
Aseptic   1 19
Dirty    14  6

        Fisher's Exact Test

data:  table
p-value = 3.931e-05
```



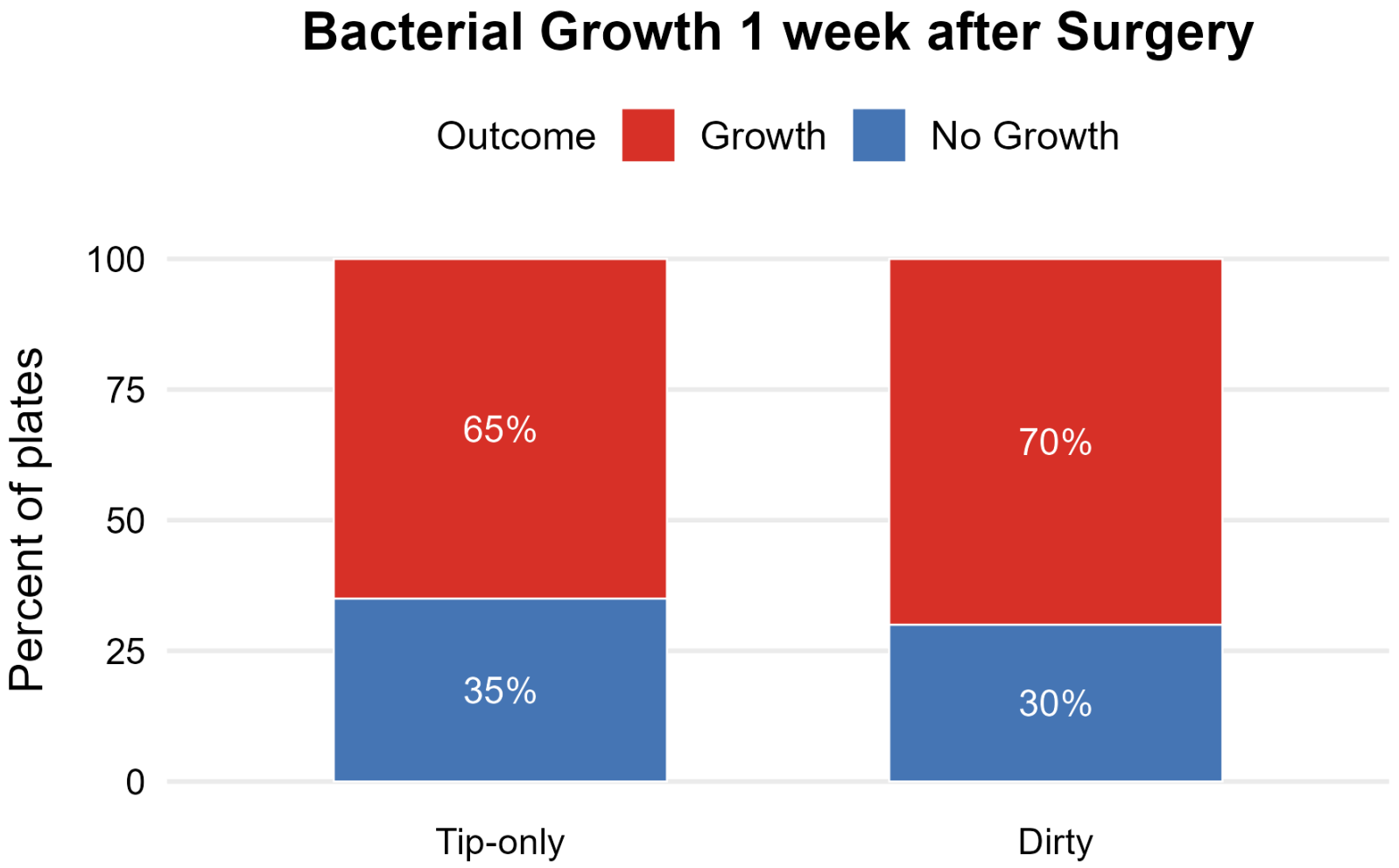
Aseptic vs Tip-only

```
           G NG
Aseptic    1 19
Tip-only 13  7

        Fisher's Exact Test

data:  table
p-value = 0.000137
```



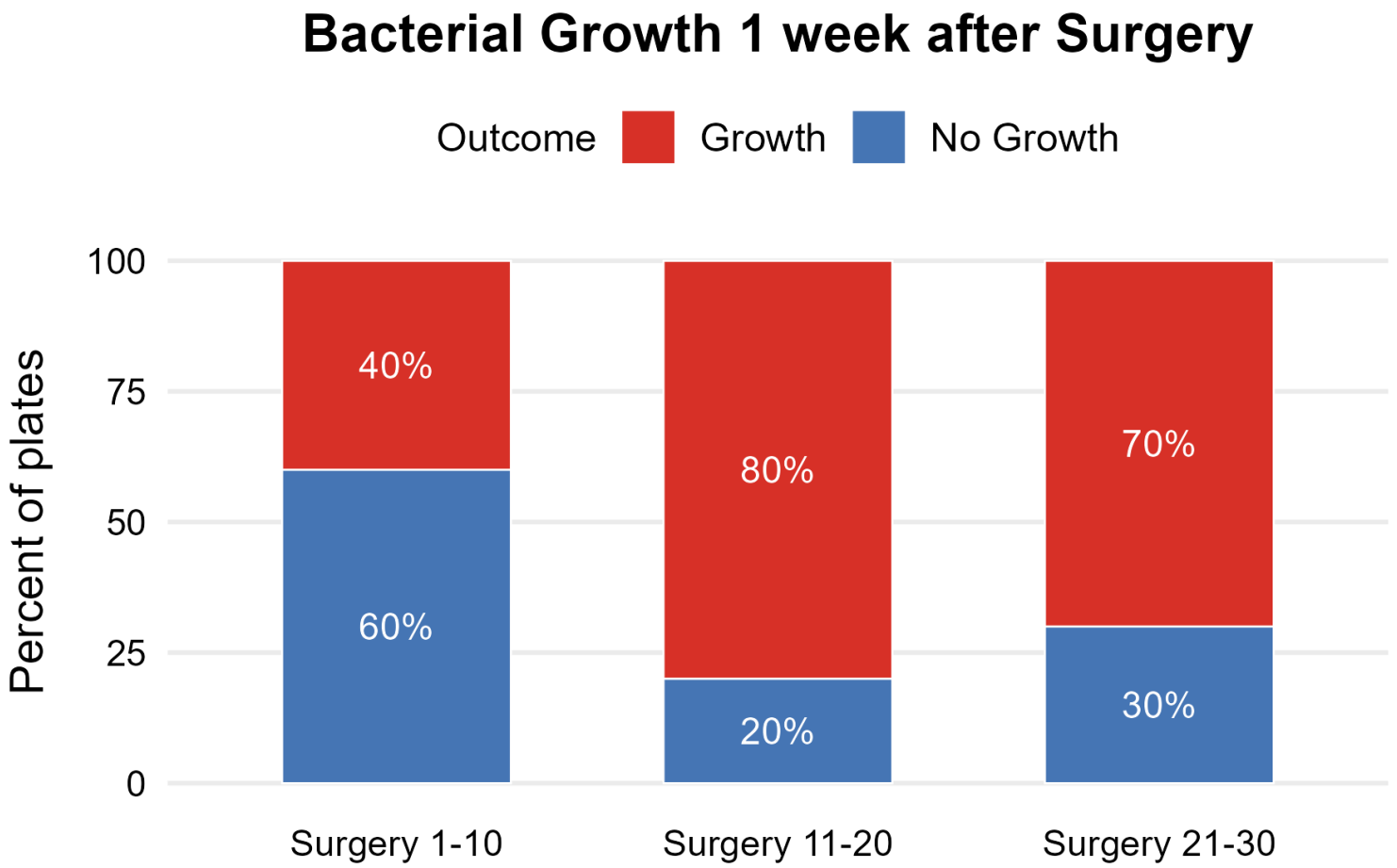
Tip-only vs dirty

```
           G NG
Tip-only 13  7
Dirty    14  6

        Fisher's Exact Test

data:  table
p-value = 1
```



Tip-only 3x10

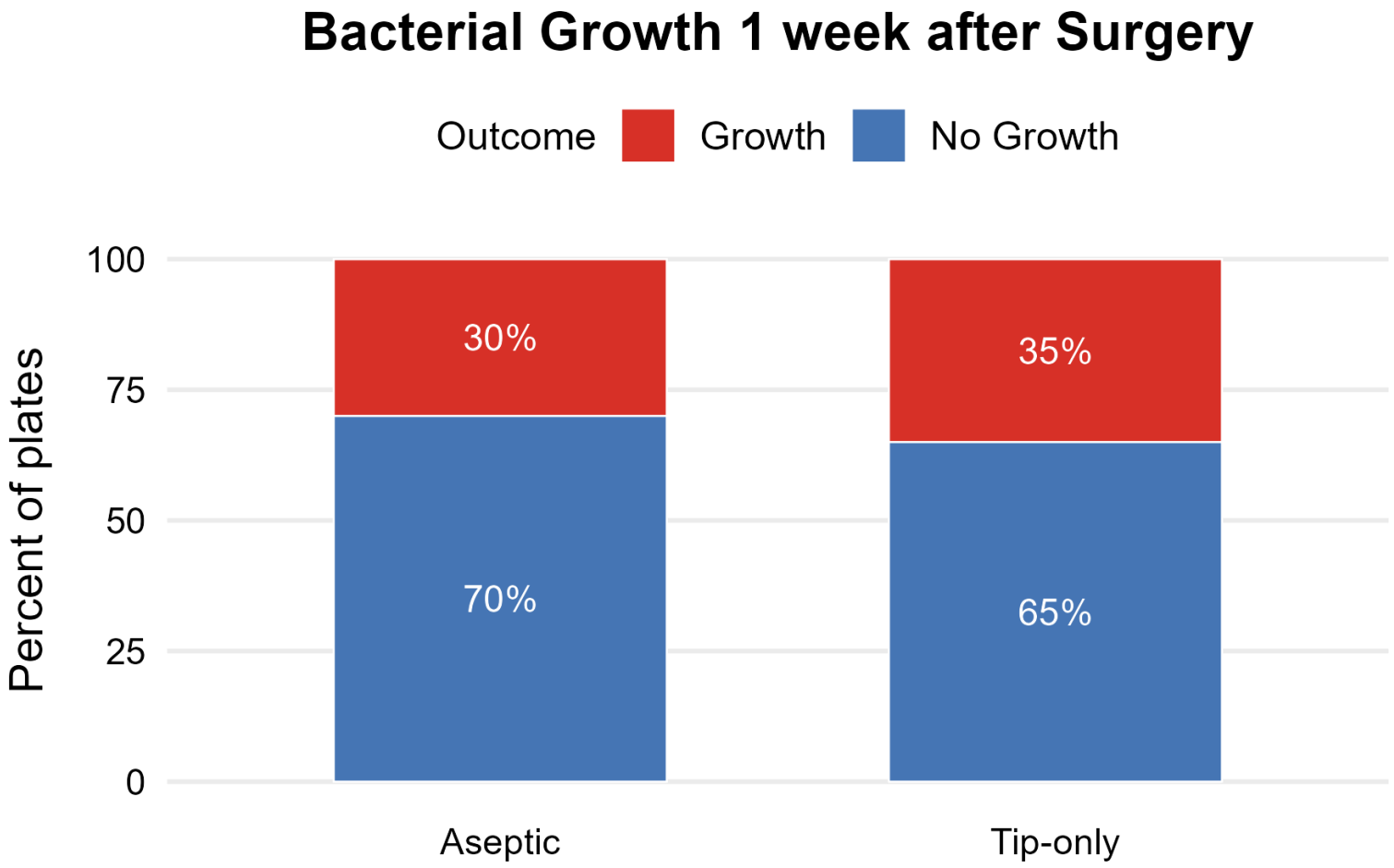
```
                G NG
Surgery 1-10    4  6
Surgery 11-20   8  2
Surgery 21-30   7  3

        Fisher's Exact Test

data:  table
p-value = 0.2485
```



DELKONKLUSION

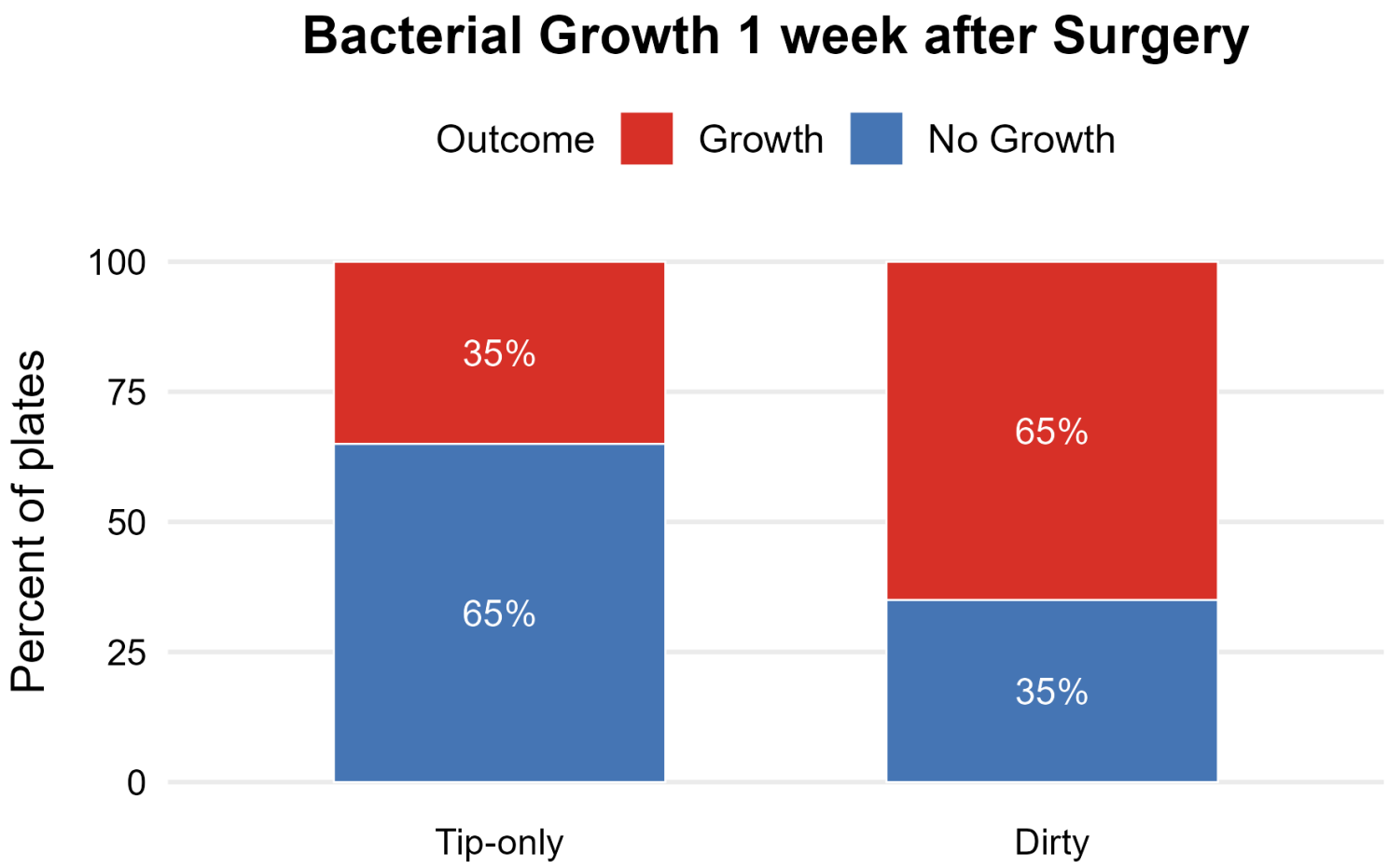
- Der er en statistisk signifikant forskel mellem den **aseptiske** og **tip-only** regimet, og ingen statistisk signifikant forskel mellem **tip-only** og **dirty** regimet.
- Når udført af denne kirurg er **tip-only** teknikken ikke signifikant overlegen i forhold til det **dirty** regime, men dog pålidelig over tid.

Aseptic vs Tip-only



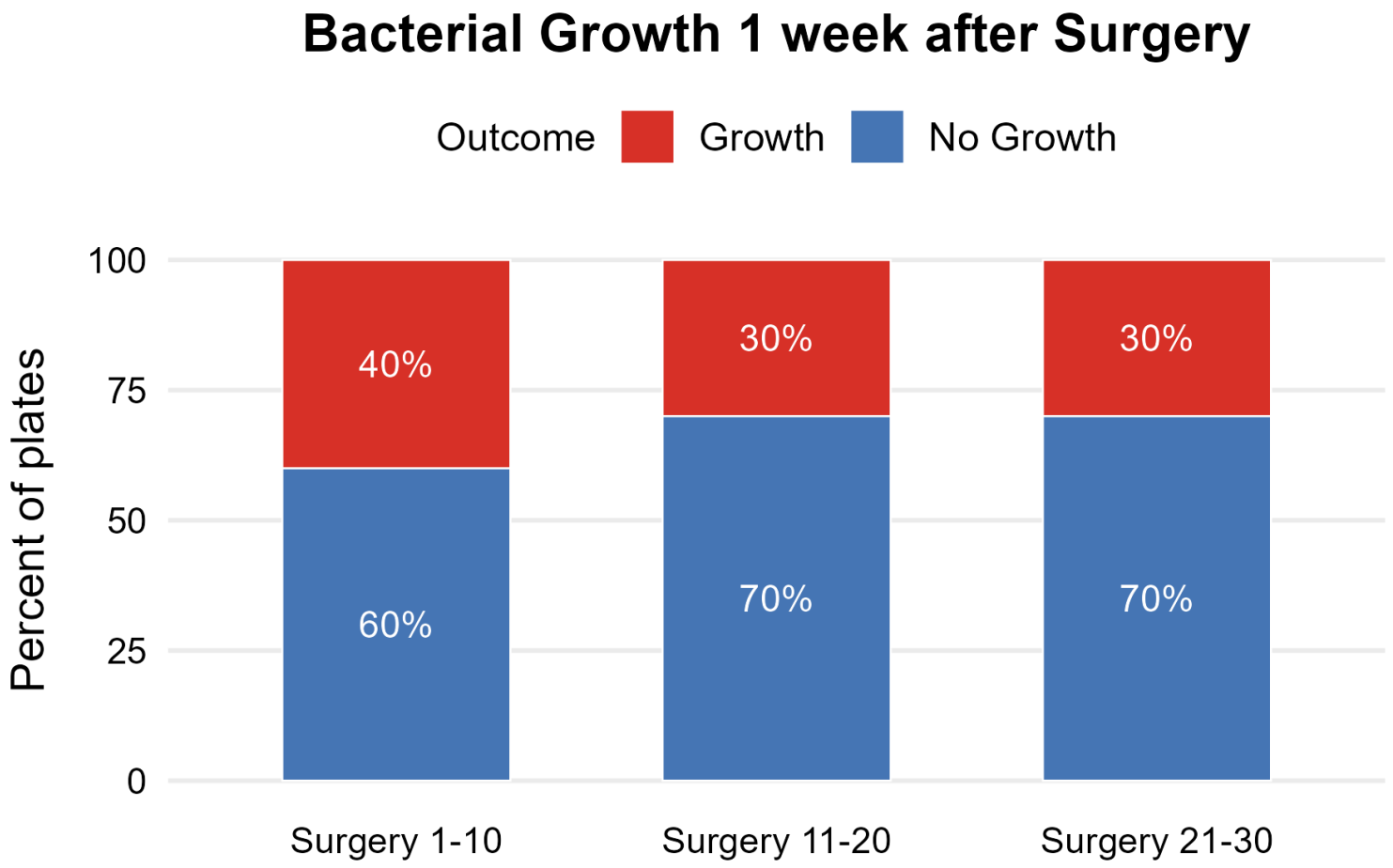

```
          G NG
Aseptic   3 17
Tip-only  7 13

        Fisher's Exact Test

data:  table
p-value = 0.2733
```

Tip-only vs dirty




```
            G NG
Tip-only    7 13
Dirty      13  7

        Fisher's Exact Test

data:  table
p-value = 0.1128
```

Tip-only 3x10




```
                  G NG
Surgery 1-10      4  6
Surgery 11-20     8  2
Surgery 21-30     7  3

        Fisher's Exact Test

data:  table
p-value = 0.2485
```

DELKONKLUSION

- Der er en ingen signifikant forskel mellem det klassisk **aseptiske** og det **tip-only** aseptiske regime, dog heller ingen signifikant forskel mellem det **tip-only** aseptiske og det **dirty** regime.
- Det **tip-only** aseptiske regime er pålideligt over tid.

SAMLET KONKLUSION

- Effektiviteten af det **tip-only** aseptiske regime afhænger af den person, der udfører operationen. Korrekt træning er essentiel inden operationen, og yderligere optimering af teknikken vil sandsynligvis også være nødvendig.

OPTIMERING AF TIP-ONLY REGIMET

- 🩹 Med/uden surgical drape
- 🧵 Skift sutur mellem hver operation

Acknowledgement

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THANK YOU!

THANK YOU FOR YOUR ATTENTION. I APPRECIATE YOUR INTEREST IN MY RESEARCH AND LOOK FORWARD TO YOUR QUESTIONS