# Acute Abdomen In The Emergency Department:
# Is CT A Time Limiting Factor?

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# Disclosures

- None to disclose

# Introduction


- ED overcrowding is a well-recognized issue in Canada[1]

## Objective

To quantify and integrate key emergency department (ED) and radiology department workflow time intervals within the ED length-of-stay (LOS) for patients presenting with an acute abdomen requiring a computed tomography (CT) scan.

- Limited research on the specific time intervals associated with image acquisition


1. Canadian et al. *BMJ*. 2011;342:d2983
2. Affleck et al. *CJEM*. 2013;15(6):359-70
3. CAR Practice Guidelines. January 2013
4. Schurr et al. *Emerg Radiol.* 2010;17(4):267-73

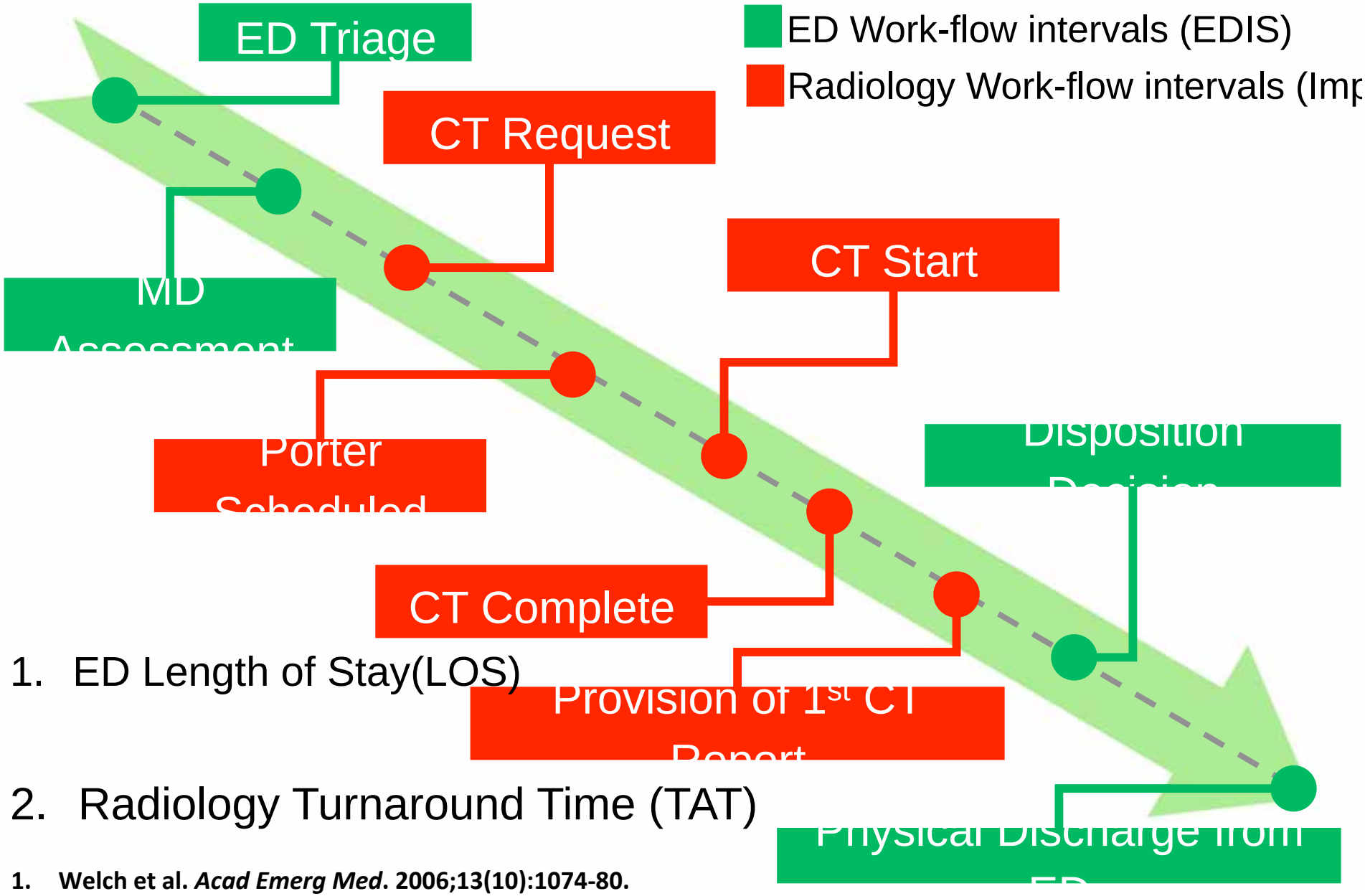
# Methods

- An 11-month (December 2009 – Nov 2010) retrospective review of all Emergency Department cases

- **Inclusion Criteria**:
  - Adult patients with acute abdomen that required urgent CT Abdomen & Pelvis

- **Exclusion Criteria**:
  - Trauma Protocol
  - Direct Ward Admissions
  - Repeat CT study within same visit

# Methods




1. ED Length of Stay(LOS)
2. Radiology Turnaround Time (TAT)


1. Welch et al. *Acad Emerg Med*. 2006;13(10):1074-80.

# Results

## Summary of ED Abdominal CT Studies

| Patient Demographics | |
|---|---|
| Total CT AP Performed | 2292 |
| Exclusions | 98 |
| Mean age | 60.1 years<br>(SD=18.9 years) |
| Male : Female | 47:53 |
| Disposition | 49.4% Inpatient<br>50.6% Discharged |

# Results

- Median ED LOS was 9.2 hours (90th percentile: 15.7 hours)
- Intervals associated with CT workflow (CT Request to 1st CT Report) accounted for 29% (2.67 hours) of the total ED LOS
  - Radiology Report TAT 9% of LOS (0.87 hours)
- 3 three unique patterns of ED disposition
  - Disposition after initial imaging report
  - Disposition prior to report
  - Disposition prior to CT scan

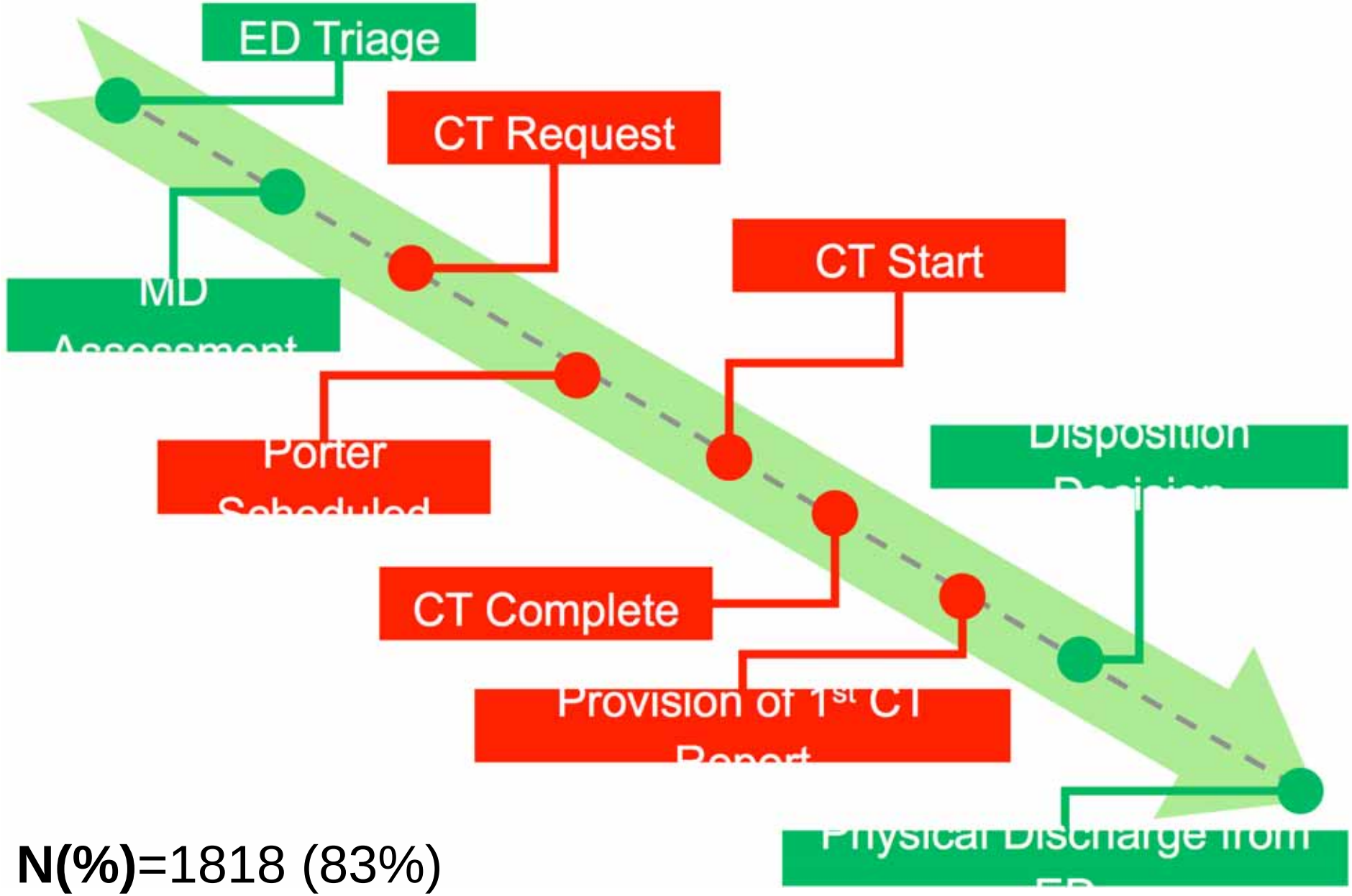
# Results

| Table 1 – ED LOS Time Intervals | | | | |
|---|---|---|---|---|
| **Time Interval** | N | Median (hours) | % of LOS | 90th % |
| **Triage to MD assess** | 2194 | 2.15 | 23.3 | 5.34 |
| **MD Assess to CT request** | 2133 | 1.37 | 14.9 | 4.57 |
| **First report to disposition decision** | 1903 | 2.05 | 22.2 | 6.41 |
| **ED LOS** | 2194 | 9.22 | n/a | 15.7 |
| **Triage to physical discharge** | 2194 | 10.9 | n/a | 24.9 |

# Results

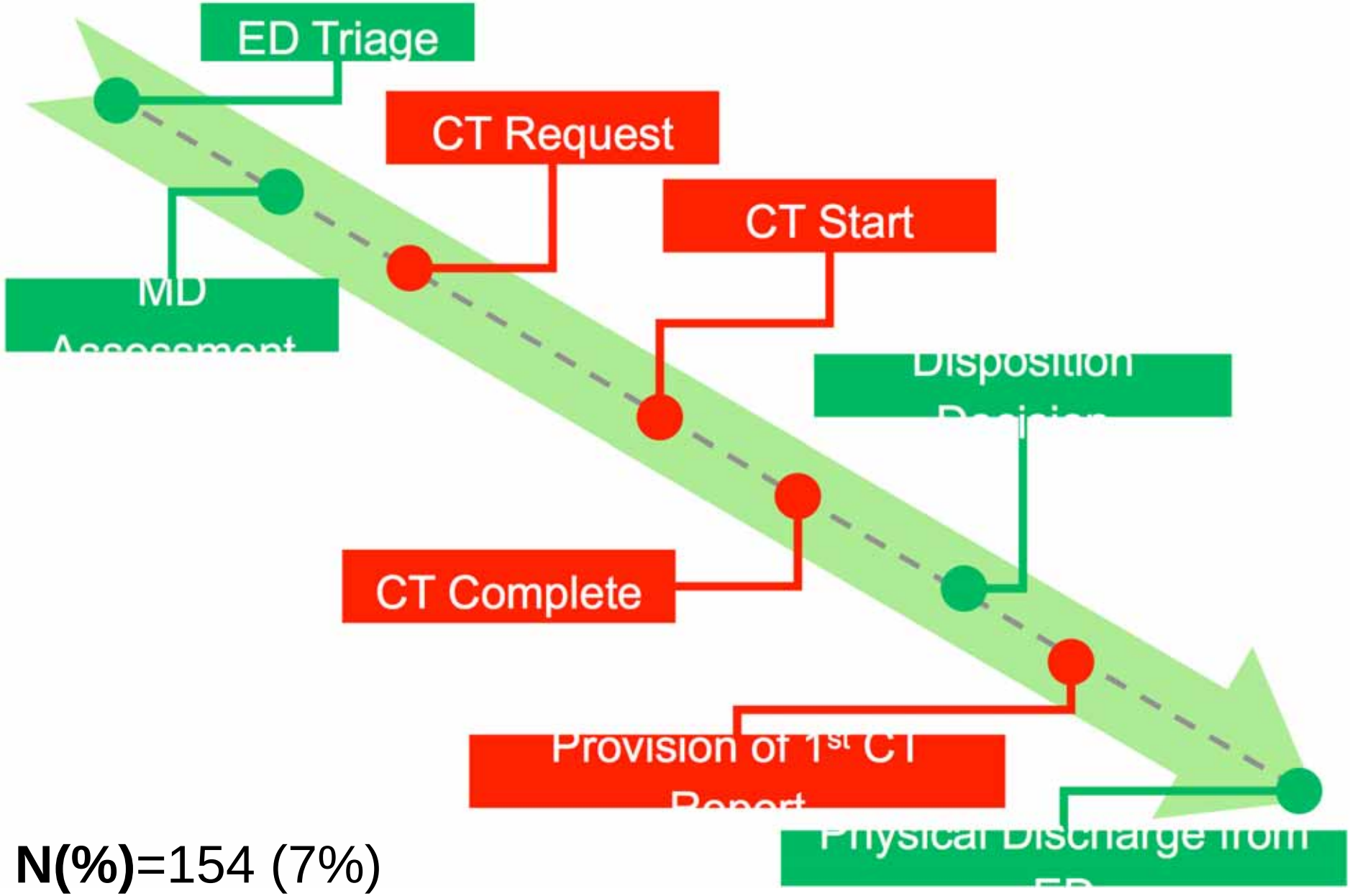
| Table 2 – CT Acquisition Time Intervals | | | | |
|---|---|---|---|---|
| **Time Interval** | N= | Median (hours) | % of median ED LOS | 90th percentile (hours) |
| **CT Request to CT start** | 2180 | 1.55 | 16.8 | 3.57 |
| **CT Request to Porter Schedule** | 2189 | 0.38 | 4.1 | 1.92 |
| **Porter Schedule to CT Start** | 1444 | 0.5 | 5.4 | 2.45 |
| **CT Start to CT Complete** | 1439 | 0.25 | 2.7 | 0.52 |
| **CT Complete to first** | 2193 | 0.87 | 9.4 | 2.43 |

# Results – Pattern 1



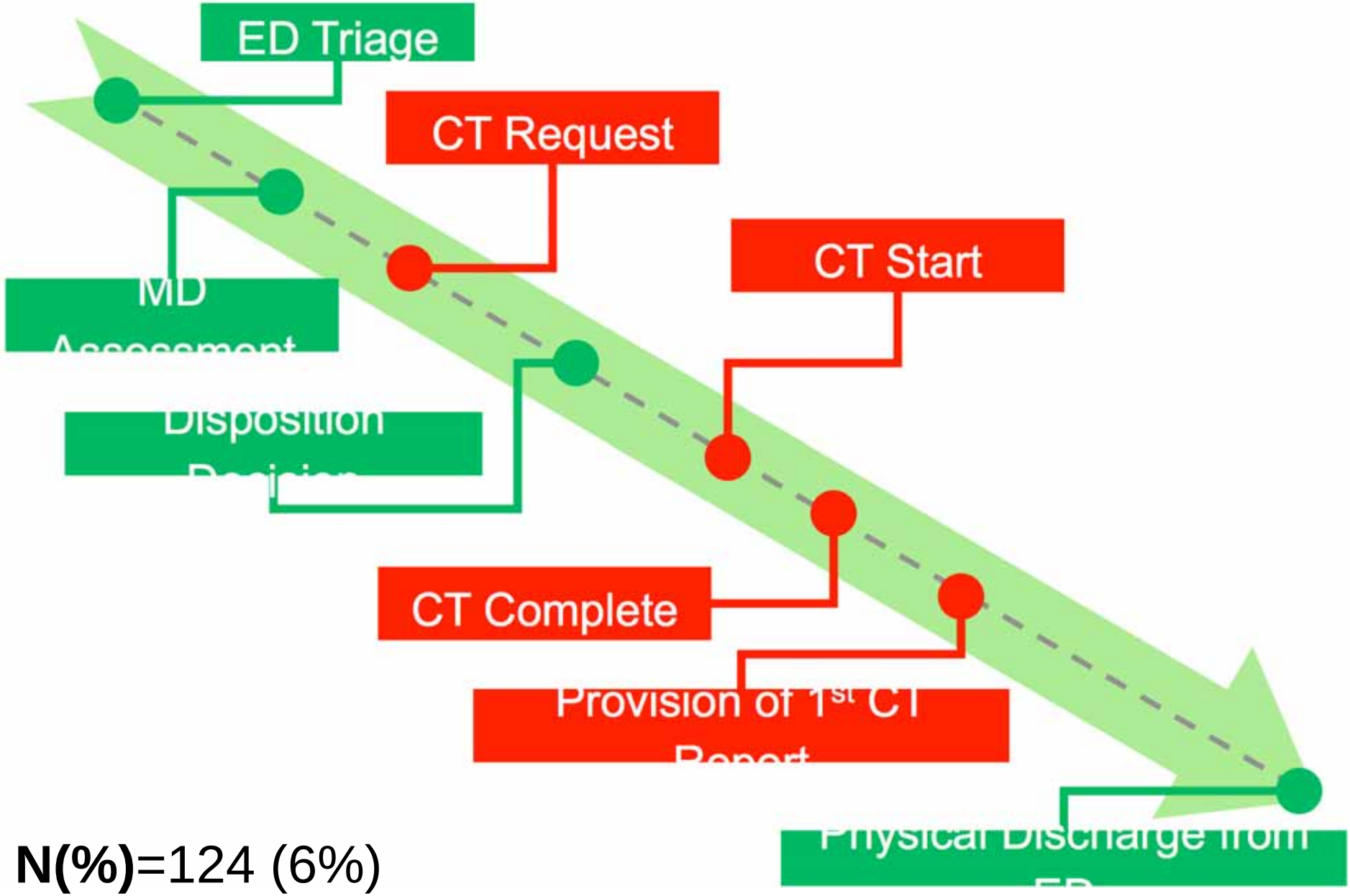

**N(%)**=1818 (83%)

# Results – Pattern 2




**N(%)**=154 (7%)

# Results – Pattern 3




**N(%)**=124 (6%)

# Discussion

- Radiology TAT to first report was under 1 hour (9% of total LOS)

- Overall mean LOS higher than current guidelines
  - Level I Trauma Centre
  - Higher acuity cohort?[1]

- Largest time intervals associated were non-radiology related
  - Triage to CT request account for approx. 40% of total ED LOS[2]

1. Rathlev et al. *West J Emerg Med.* 2012;13(2): 163-8

# Discussion

- Total imaging acquisition time interval account for appox. 29% of ED LOS (2.67 hours)

- Non-identical patterns of disposition for patients = over/under-estimation of contribution of radiology?
  - Pattern 2: Wet-reads?[1]
  - Pattern 3: Diagnosis was made without imaging


1. Tobey et al. *Radiol Manage*. 2014;36(1):40-4.
2. Affleck et al. *CJEM*. 2013;15(6):359-70

# Discussion

- Single institution study (trauma centre)
- Retrospective study design
  - Outlier data
- Our study serves as a baseline study for future reporting of image acquisition time intervals as well as for future QI initiatives at SBHC

# Conclusion

- Radiology report TAT for CT was not the limiting step in ED LOS
- Patients do not have identical ED transit pathways and this may under- or over-estimate the relative contributions of image acquisition workflow timeline
- Demonstrates importance of site-specific time-line interval analysis for QI monitoring and interventions
- Image acquisition process is a potential area for

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**Thank you for your**

# References

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