AI and NLP in Claims Management: Strategies for Reducing Costs and Improving Efficiency
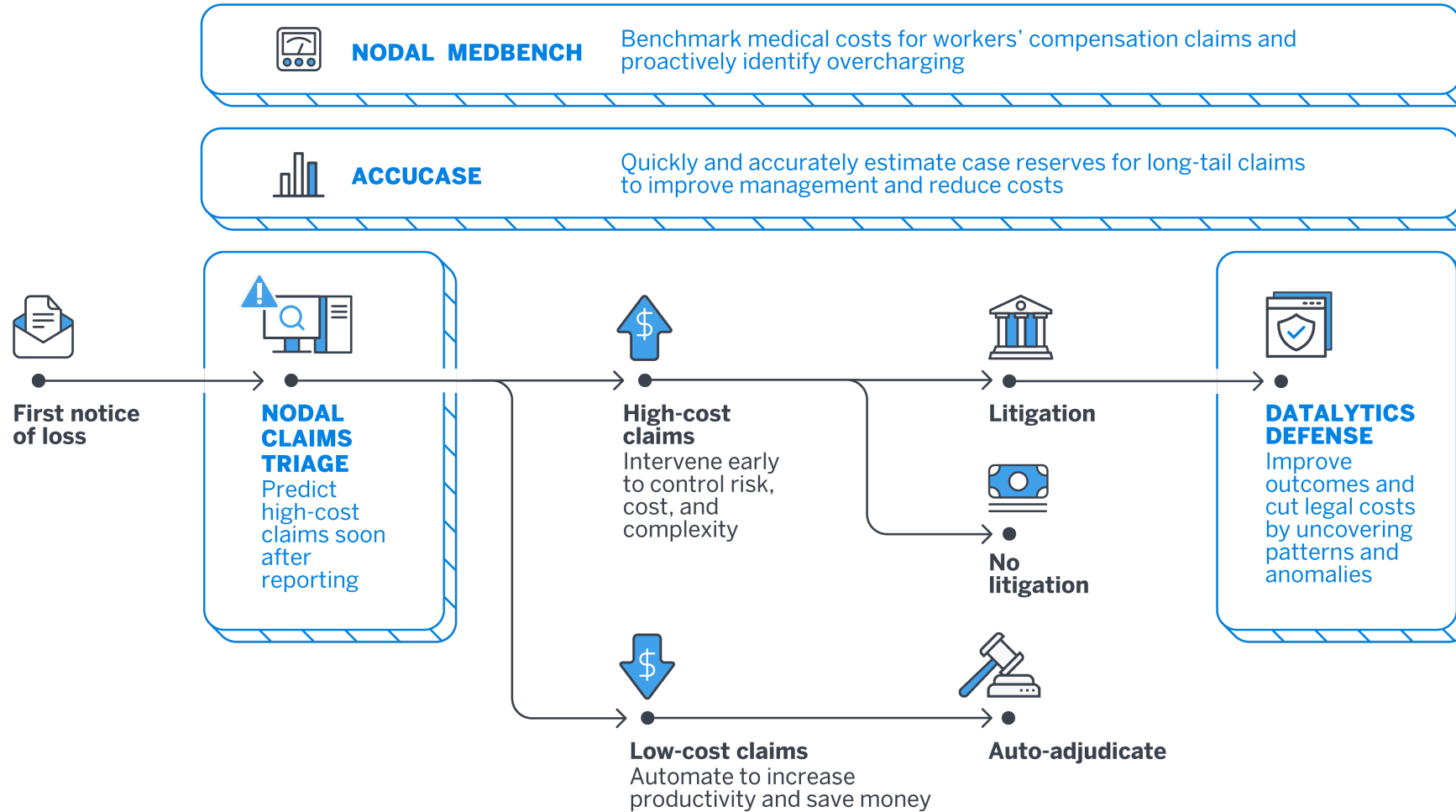
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Principal

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Milliman P&C - AI Claims Solutions

Milliman proprietary technology and data deliver unparalleled value to our clients.

NODAL MEDBENCH — Benchmark medical costs for workers' compensation claims and proactively identify overcharging

ACCUCASE — Quickly and accurately estimate case reserves for long-tail claims to improve management and reduce costs

First notice of loss

NODAL CLAIMS TRIAGE
Predict high-cost claims soon after reporting

High-cost claims
Intervene early to control risk, cost, and complexity

Litigation

No litigation

DATALYTICS DEFENSE
Improve outcomes and cut legal costs by uncovering patterns and anomalies

Low-cost claims
Automate to increase productivity and save money

Auto-adjudicate

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Milliman Nodal

Improve claims management and reduce costs by quickly identifying new data on claims.

Problem

Manual claims processes are inefficient.

- The top 10% of claims are 80% of cost
- Problematic claims are often identified too late
- Adjuster resources are used inefficiently
- Lack transparency into drivers of claim costs
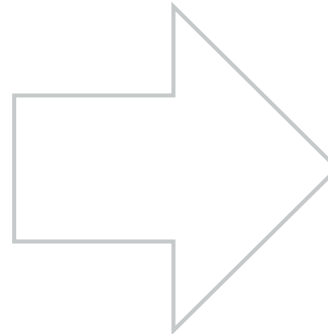
Solutions
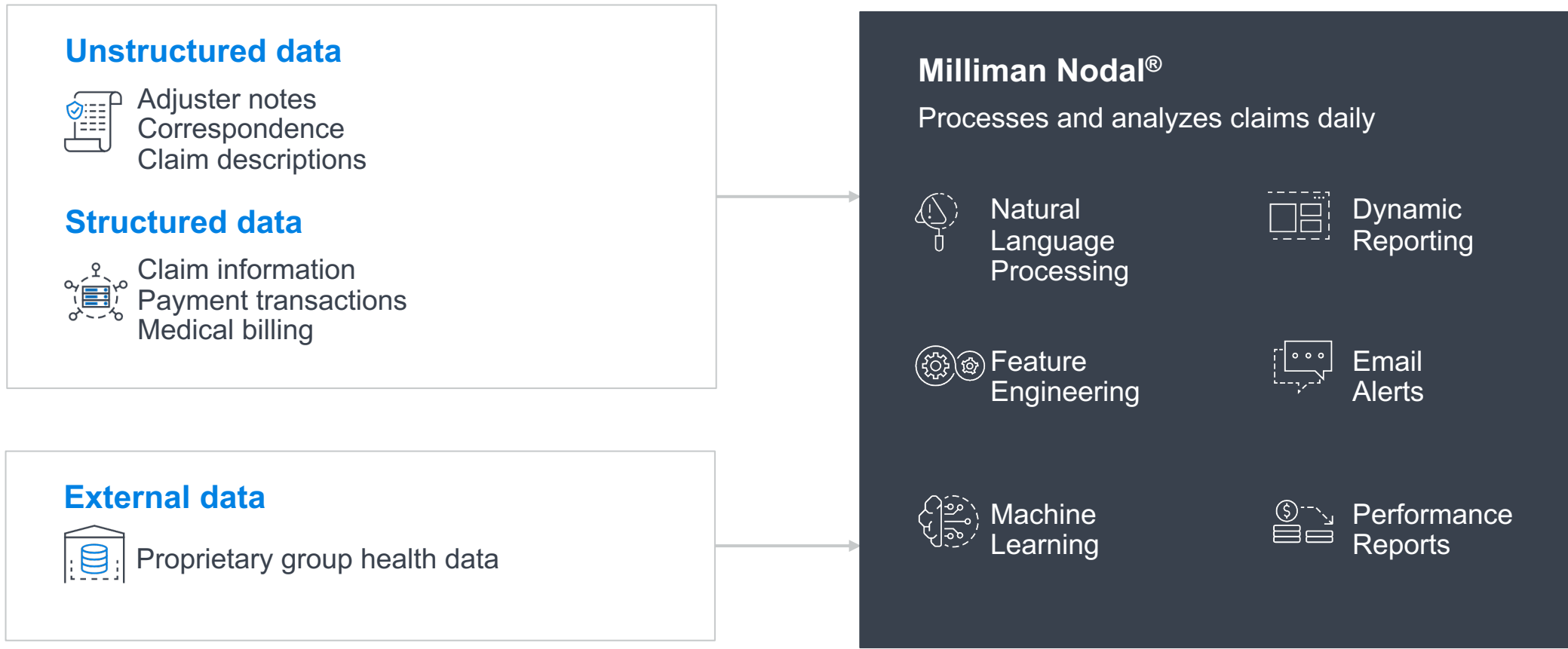
Milliman Nodal Claims Triage

Predicts future claim outcomes shortly after FNOL for triage

Milliman Nodal Medical Benchmarking

Identifies WC medical overspend versus Milliman's proprietary commercial healthcare dataset

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Nodal process

Nodal **predicts future claim outcomes and benchmark medical costs** as new claims are reported.

Unstructured data
Adjuster notes
Correspondence
Claim descriptions

Structured data
Claim information
Payment transactions
Medical billing

External data
Proprietary group health data

Milliman Nodal®

Processes and analyzes claims daily

Natural Language Processing

Dynamic Reporting

Feature Engineering

Email Alerts

Machine Learning

Performance Reports

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Nodal Claims Triage

Problem: High-cost claims are identified too late

1

Few claims drive cost

The top 10% of claims are 80% of cost. Often these claims are identified too late, resulting in inefficient outcomes.

2

Human judgement

Most claim departments assign claims based on subjective criteria made by a human, resulting in inconsistent treatment of similar claims and without consideration of all claim characteristics.

3

Unreliable data

The structured data is often limited by inconsistent coding, missing information, and outright inaccuracies, limiting the ability of the claims organization to effectively deploy analytics.

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Value of unstructured data

Nodal enriches claims data by extracting valuable data from unstructured text data.

Objective

Structured data is naturally limited and…

→ **Inaccurate:** wrong body part or nature

→ **Inadequate:** non-specific medical detail

→ **Inconsistent:** the same claim coded differently

Extracting information from unstructured data, such as adjuster notes, leads to more accurate predictions.

Nodal

Comparison of structured and unstructured data.

Data Element	Standard Claim Data	Data Extracted by Nodal
Nature	Contusion	Dislocation, Fracture
Body Part	Elbow	Shoulder, Wrist, and Elbow
Medical	$0 Paid	Hospitalization, MRI, Surgery
Co-Morbidities	N/A	Diabetes

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NLP example

Workers' Compensation

IW reports _sharp pain_ in the right _shoulder_ occasionally. He reported that _pain continues to radiate_ to _forearm_ and occurs with certain
Diagnosis   Body_Part
motions. IW reports 1/10 pain-rest and increased pain 5-6/10 with activity. He reports that it does take him a little longer to fall asleep but once he does he doesn't having any difficulty staying asleep. Feels that pain has improved since initial injury but _still having sharp pain_ with lifting motion.

IW reports that he was participating in training. He stated that during an exercise in which he was using a tool weighing 1-2lbs to force open a door. He stated that while doing this he _felt a sharp pain_ that radiated down the top of the _forearm_. He stated that he _was sore/stiff_ but was okay then the next morning had _arm weakness_.

IW reported that he _went to urgent care_ for evaluation the next day. He stated that _they did an X-ray_ but it was _inconclusive for separated_
                          Treatment   Negation
shoulder. He was told to rest/ice and _take Ibuprofen 600mg_. He returned to clinic a week later, _obtained another X-ray_ which again inconclusive. Then they _ordered the MRI_ of right _shoulder_.

Xray obtained. _Ibuprofen 600mg_ every 6 hrs x 3 days then every 12 hrs. Shoulder ROM exercises, ice.

Strain of right shoulder S46.911

MRI shoulder ordered. _Xray obtained_

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NLP example
Auto Liability

FL loss Reported 21 days late. <u>Claimant has an attorney</u>. liab invest needs completed and we would need theory of liability since it is reported that the insureds vehicle is unoccupied <u>clmnt is attorney represented</u> and in atty letter they are advising injuries to <u>neck, chest</u> and <u>emotional distress set a BI res of 30k</u> and did not set a PD res since report appears to put clmnt at fault for the loss.

Insureds vehicle <u>rear ended claimants vehicle</u> stopped at a yellow light

48hr loss description:insured unit <u>rear ended claimant</u> box truck that stopped at yellow light IA still trying to contact insured for form and version of loss PR not available at this time. <u>liab still appears adverse to insured</u> once we can identify claimant we will follow up to set up estimate on CV and see if a bi is being presented. PD res appears in line at this time. update: IA sent in email and is setting up a time to complete the estimate on the CV <u>clmnt advised he has a follow up dr. appointment</u> on 5/23 but if he is not having any symptoms on that date. will hold until official report recvd before opening up a bi res.

10 day update: PR recvd and confirms <u>insured is liable for loss and was cited for rear ending claimant</u>. claimant statement: He stated he has been <u>sore in his back and neck</u> since the loss. He did seek treatment because he is also having problems with his <u>right eye</u>. The claimant stated he <u>went to the doctor</u> on the day of the loss and <u>had X-rays</u> taken of his <u>back</u> and his <u>right eye</u> inspected. The doctor told the claimant he has <u>floaters in his right eye</u> and his <u>eye seemed out of place</u>. The claimant has a follow up appointment on June 5th. He and the doctor hope the floaters go away before then.   IA has set up an appraisal on the CV and once completed he will send in for review <u>will set a bi res of 25k</u> due to treatment and possible <u>eye</u> issues. We would need to know the severity of the loss since it appears claimant was also in a larger commercial vehicle. IA has auth to 5k to resolve bi claim and once claimant has follow up appointment on the 5th we will try to get bi resolved at that time.

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Claims Triage workflow

Client Data

Batch daily feeds from claims system via secure FTP

NLP & AI

- Process and enrich data with Milliman data assets.
- Extract risk factors from unstructured data using NLP
- Predict claim scores

Delivery of Results

- Adjusters notified with alerts for new high scores and high-risk claims.
- Predictive analytics accessible in web-based application.

Benefits

- Increased focus on high-cost claims early in the lifecycle
- More accurate data resulting in better decision making
- Lower cost outcomes and faster cycle times
- Focus your cost containment strategies on the right claims

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Case study: Insights from NLP

Background
- Attorney involvement is often not tracked in traditional claims systems
- While it's known that claims with attorneys are more costly, it was difficult to measure without leveraging unstructured data

Findings
- We leveraged Nodal's NLP capabilities to identify claims with an attorney

Conclusion
- Substantial cost increases due to attorney involvement
- Claims with attorney involvement close much slower resulting in significantly more indemnity

Cost and cycle time by attorney/surgery
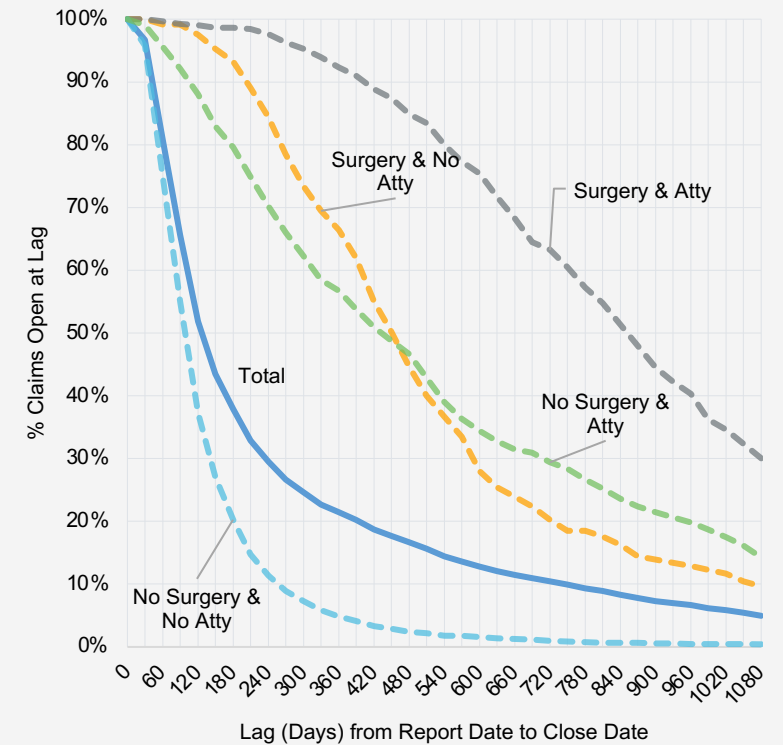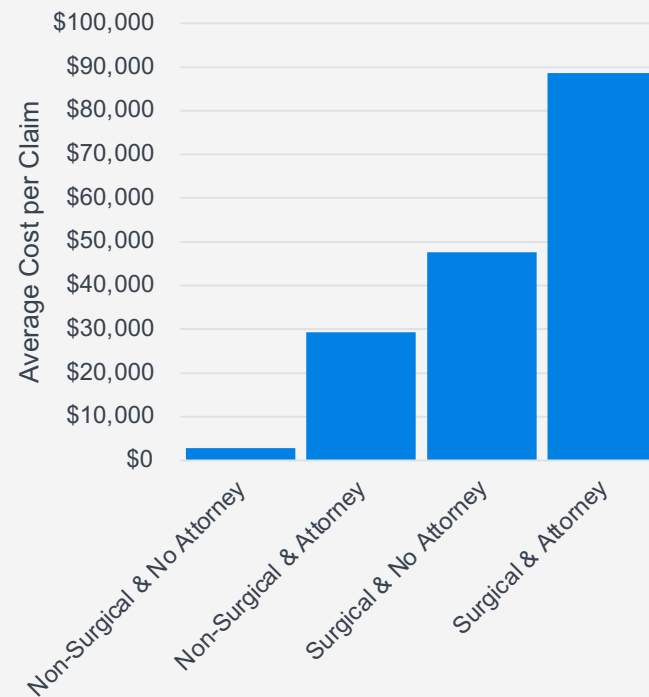
Case study: Claims Triage savings

Background
- Client implemented Claims Triage prior to 2019
- Claims monitored daily and adjusters were notified of any high-risk claims

Findings
- All years developing 10%+ lower than expected
- Claims begin to develop differently around 6 months in age

Conclusion
- Early identification of high-cost claims leads to significant cost savings

Cost savings by year

2019 — Expected, $19,170; Actual, $16,926

2020 — Expected, $18,852; Actual, $14,202

2021 — Expected, $17,316; Actual, $15,432

2022 — Expected, $11,757; Actual, $9,325

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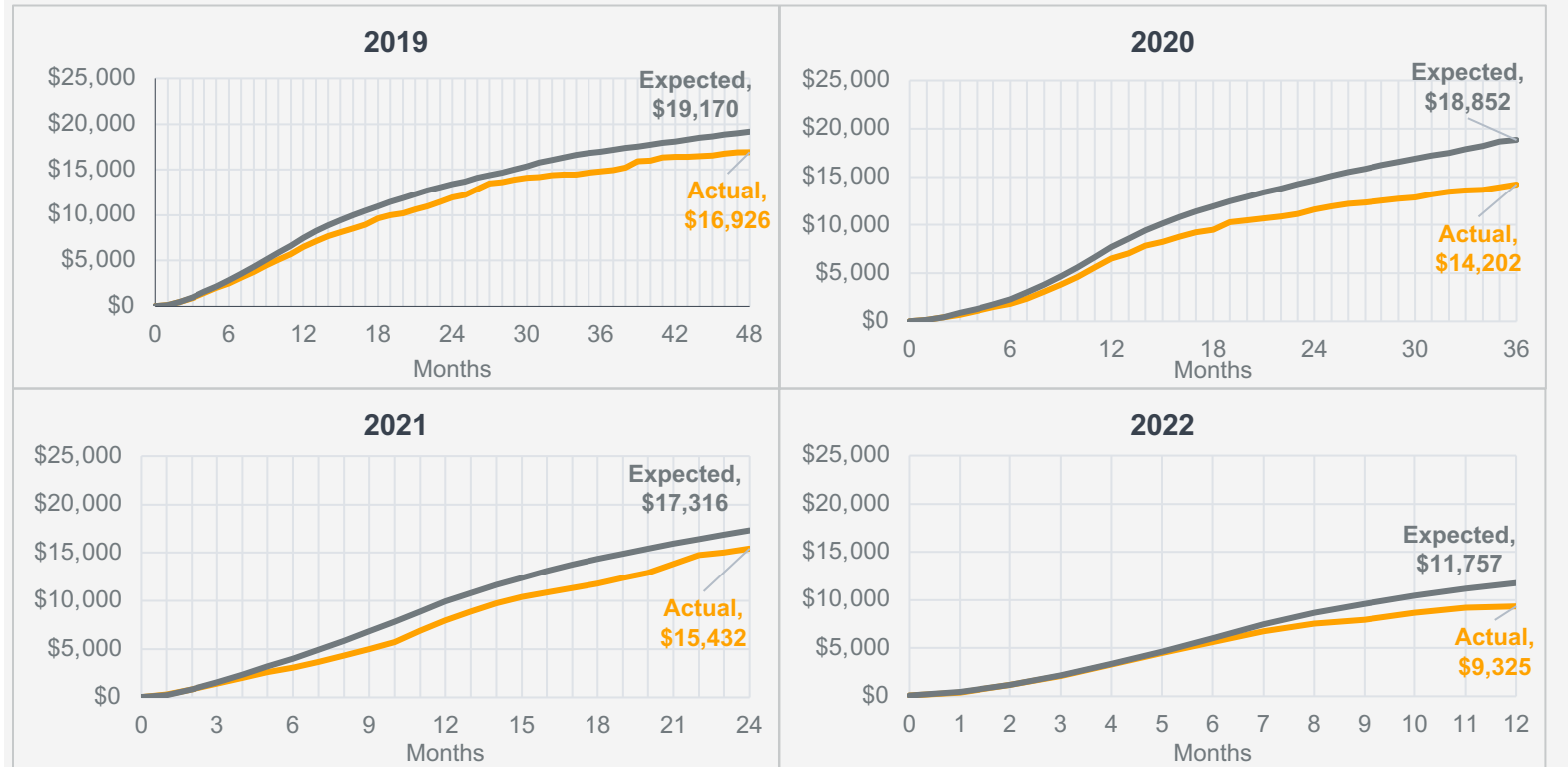
Nodal Medical Benchmarking

Problem: Wasteful medical spending in WC

Workers' Compensation (WC) payers overspend relative to their counterparts in group health insurance.

1

High-Cost outcomes

Medical costs are 50-60% of WC benefits and continue to trend at rates higher than inflation.

For similar conditions, **WC spends 60-100% more than group health**; driven by over-utilization and high pricing.

2

Qualitative decision making

Claim adjusters approve treatment and authorize payments, but **adjusters typically do very little negotiation** on everyday bills and only negotiate rates on complex or high-cost items.

3

No price transparency

WC Payers have no insight into how their peers in group health perform and often can only benchmark themselves against their own historical data or industry WC data.

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Right treatment plan, right provider, and right price

Milliman SMEs support our clients to supplement Nodal clients to help achieve ROI.

Strategic insight

Identify opportunities to reduce medical spend across many claims

- Identify conditions with significant overspend
- Compare utilization and unit cost
- Optimize provider networks and physician education
- Steer claimants to optimal providers
- Develop new payment strategies

Value generation

Reduce the cost of medical care and reduce cycle times

- Benchmark against 1/3 of all US adults
- Transparency into group health claims
- Impartial benchmarks on industry leading data

Tactical insight

Identify opportunities to reduce the cost of individual claims

- Benchmark treatment pre and post surgery
- Automated alerts for outliers
- Identify high performing providers near claimant
- Opportunities for patient outreach

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Medical Benchmarking features

Treatment benchmarks

Compare medical costs to group health benchmarks by condition

Provider ratings

Find the highest performing providers close to your injured worker.
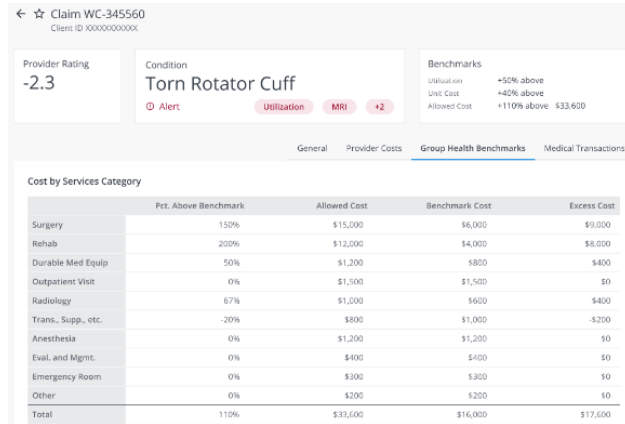
Cost drivers

Identify drivers of overspend on medical benefits

Identify problematic injuries

Uncover injury types where you significantly overspend relative to group health

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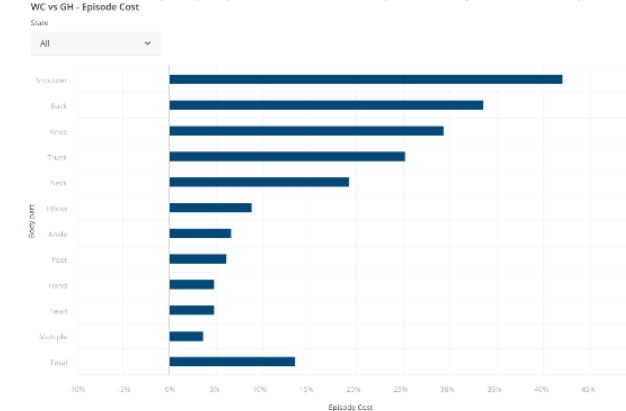
Medical Benchmarking workflow

Client data

Batch daily feeds from claims system via secure FTP

Data enrichment

Process and enrich data with Milliman assets

- Group health claim data
- Pre-existing health conditions
- Natural Language Processing
- Groupers
- Global RVUs

Delivery of results

- Benchmarks and analytics accessible in web-based application.
- Providers rated against peers based on performance relative to benchmarks.
- Benchmarks based on condition, area, surgical/non-surgical, surgery type, etc.
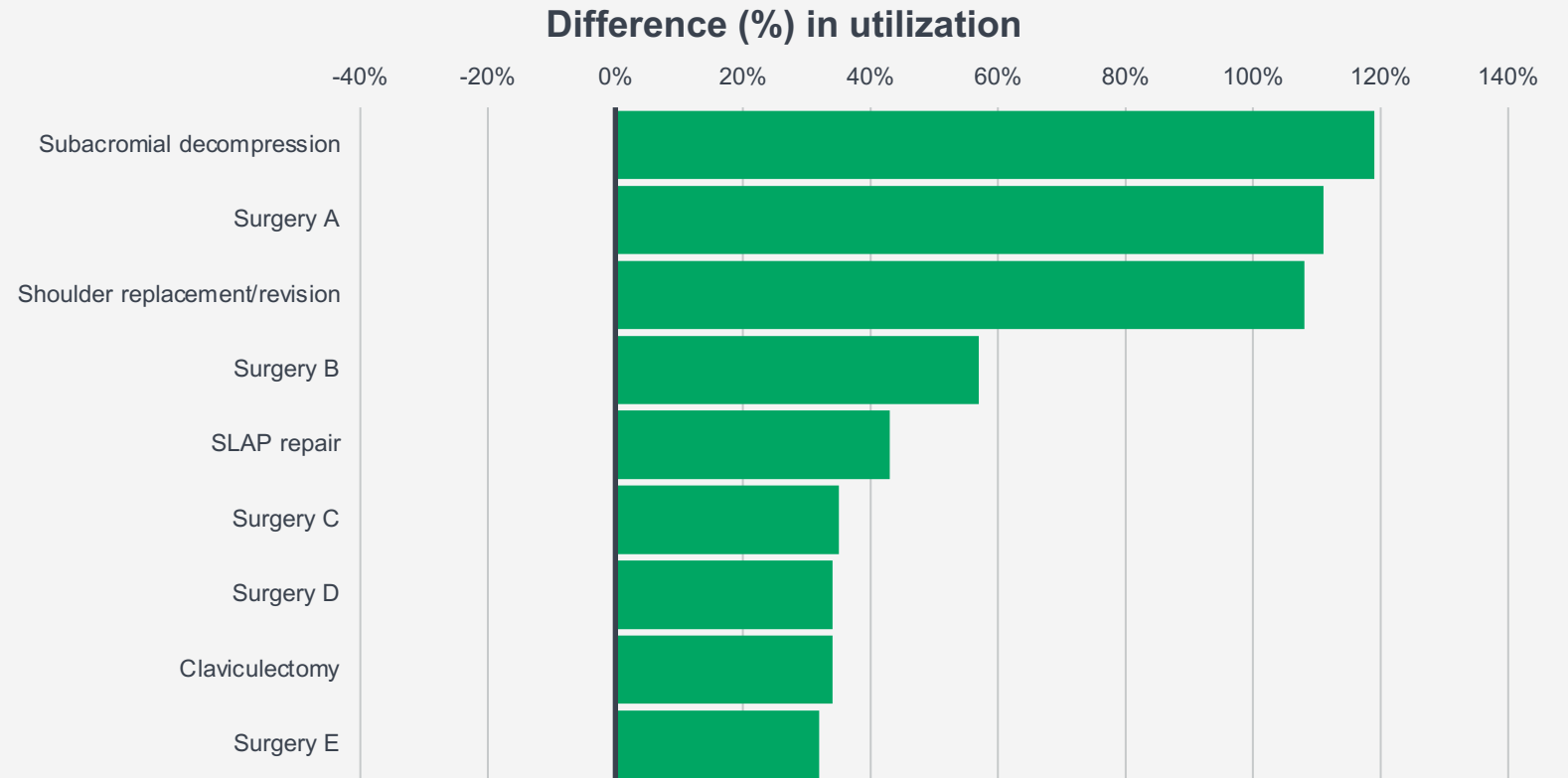
Benefits

- Improved strategies based on transparent data
- Lower cost outcomes with increased consistency
- Competitive advantage with unparalleled data
- Collaborate with Milliman experts in the cost of medical care

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Case study: Utilization

Case study

- Shoulder injuries are the most expensive workers comp injury on average

- This case study compares workers claims to comparable episodes from group health

- **After repricing the group health to workers comp levels, the WC utilization is 42% higher than GH**

*Group health data repriced to workers comp based on industry data

Difference (%) in utilization

Procedure	
Subacromial decompression	
Surgery A	
Shoulder replacement/revision	
Surgery B	
SLAP repair	
Surgery C	
Surgery D	
Claviculectomy	
Surgery E	

Axis: -40%, -20%, 0%, 20%, 40%, 60%, 80%, 100%, 120%, 140%

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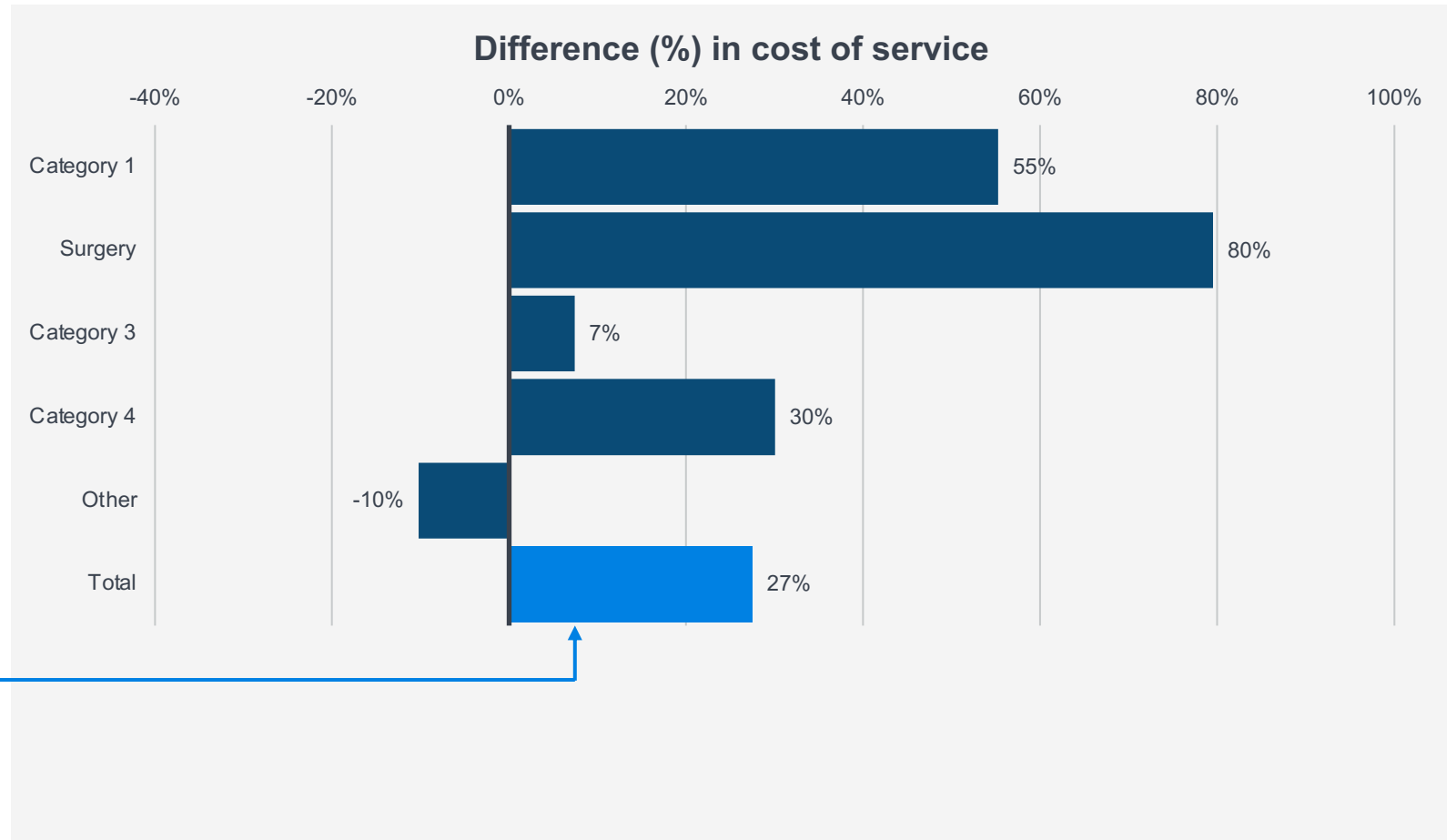
Case study: Unit cost

Methodology

- Detailed medical data for 200k WC bills across the US including relevant coding: CPT, HCPCS, etc.
- Compared WC costs to Milliman's proprietary group health database
- The case study utilizes WC payments after reductions for fee schedule and network provider rates

Findings

- Almost 30% of services cost more than 50% higher in WC than in group health
- **WC overspent 27% in comparison to group health for the same services**

Conclusion

- Significant opportunity for savings

Difference (%) in cost of service

Category	Difference
Category 1	55%
Surgery	80%
Category 3	7%
Category 4	30%
Other	-10%
Total	27%

Thank you

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