# IV CONGRESSO NAZIONALE

SOCIETÀ ITALIANA
G.U.I.D.A.
PER LA GESTIONE UNIFICATA E INTERDISCIPLINARE
DEL DOLORE MUSCOLO-SCHELETRICO E DELL'ALGODISTROFIA

Giuseppe Toro

## Bone fragility: conceptual framework, therapeutic implications and covid-19 related issues

Centro Congressi Unione Industriali

TORINO 11-13 MAGGIO 2023

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# Definizione

The group defined frailty as

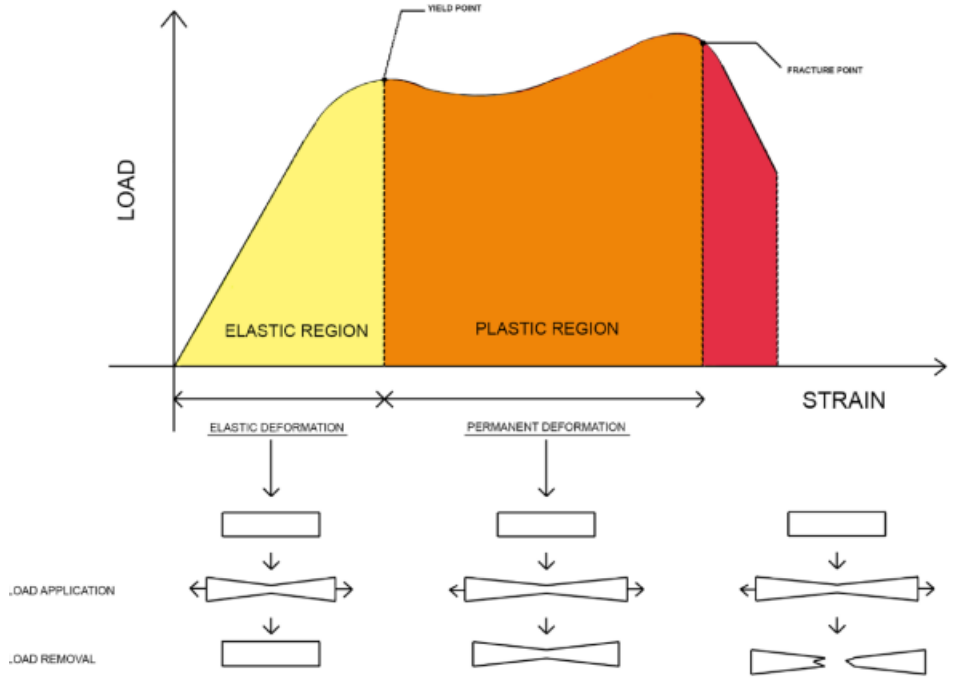
> "A medical syndrome with multiple causes and contributors that is characterized by diminished strength, endurance, and reduced physiologic function that increases an individual's vulnerability for developing increased dependency and/or death."

Morley et al., J Am Med Dir Assoc. 2013

**Frailty Consensus: A Call to Action**

# Definizione

- Per fragilità dello scheletro si intende una ridotta capacità di quest'ultimo di resistere a stress meccanici.




**Bone fragility: conceptual framework, therapeutic implications, and COVID-19-related issues**

Giovanni Iolascon, Marco Paoletta, Sara Liguori, Francesca Gimigliano and Antimo Moretti

TAMD 2023

# Fragilità clinica ed osteoporosi

**Comparison between frailty index of deficit accumulation and fracture risk assessment tool (FRAX) in prediction of risk of fractures**

Bone 2015

**Guowei Li**[a,#], **Lehana Thabane**[a,b], **Alexandra Papaioannou**[c], and **Jonathan D. Adachi**[b,c,#]

To conclude, both the FI and FRAX significantly predict risk of major osteoporotic and hip fracture significantly using the GLOW 3-year Hamilton cohort. The FI is comparable with FRAX in prediction of risk of future fractures, indicating that measures of frailty status may aid in the fracture risk assessment and fracture prevention in the elderly. Further evidence from randomized controlled trials of osteoporosis medication interventions is needed to

# Fragilità clinica ed osteoporosi

- Fragilità maggiore = osteoporosi più grave

- Fragilità aumenta dopo frattura da osteoporosi

Li et al. BMC Musculoskeletal Disorders 2017
Cooper et l., Osteoporosis Int 2012

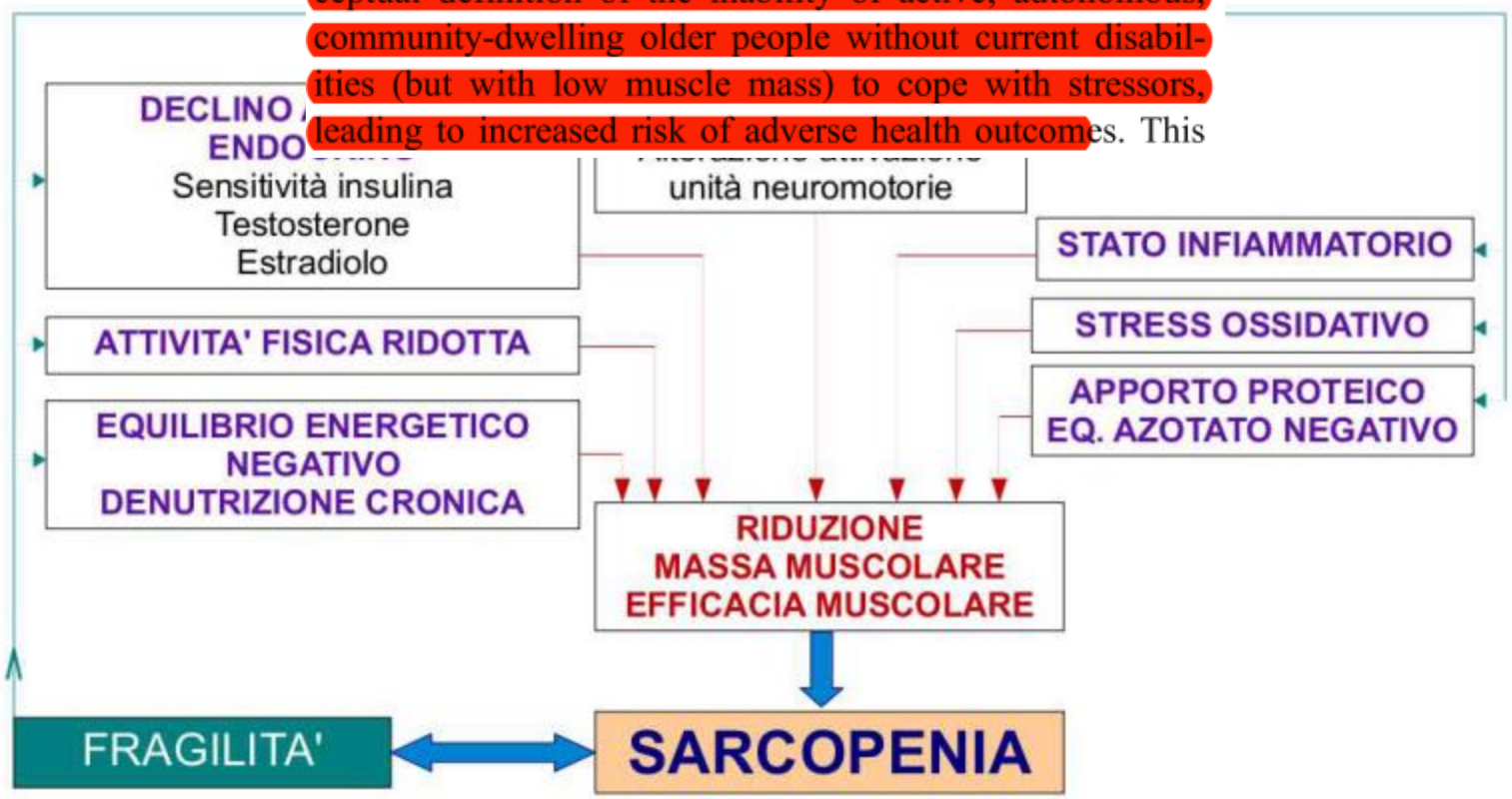
Frag

**Frailty and sarcopenia: definitions and outcome parameters**

C. Cooper · W. Dere · W. Evans · J. A. Kanis ·

Osteop Int 2012

studies. We suggest the term sarcopenic frailty, with a conceptual definition of the inability of active, autonomous, community-dwelling older people without current disabilities (but with low muscle mass) to cope with stressors, leading to increased risk of adverse health outcomes. This



# Fragilità – sarcopenia - osteoporosi

- Invecchiamento
- Malnutrizione
- Deficit cognitivi
- Depressione

Tarantino et al., GIOT. 2015
Colón-Emeric, Curr Osteoporos Rep 2013

# Epidemiologia

- La probabilità di fratture a bassa energia aumenta con l'età in entrambi i sessi ,ma con una prevalenza del sesso feminile.

- A 45 aa. il rischio è 47,3% in F, 23,8% in M

- Ogni anno 410.000 fratture da fragilità in Italia (dati Mistero della Salute)

Tarantino et al., J Orthop Traumatol 2017

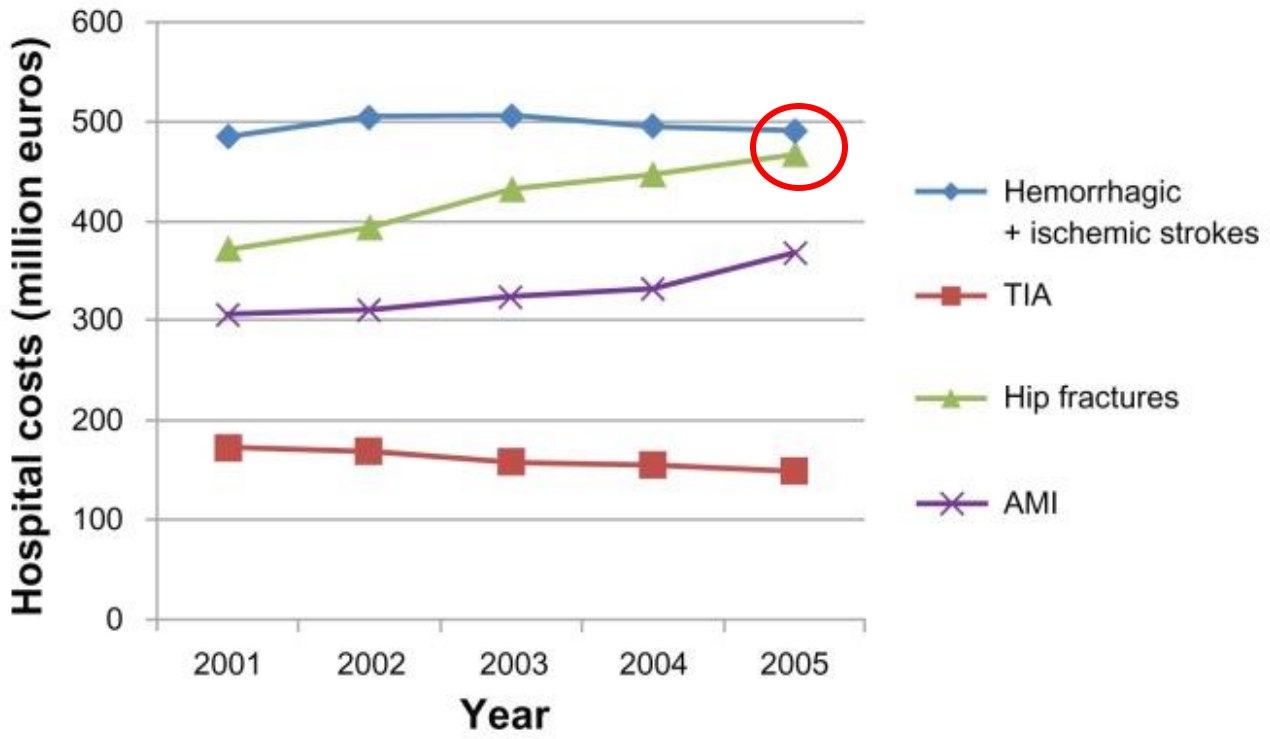
# Problematiche legate alla frattura di femore nel paziente fragile

- **Gravano pesantemente sul sistema sanitario italiano:**
- **costi diretti**
  - trattamento in acuto in ospedale
  - complicanze post-operatorie
  - programmi di riabilitazione
- **costi indiretti**
  - oneri per le famiglie
  - disabilità del paziente

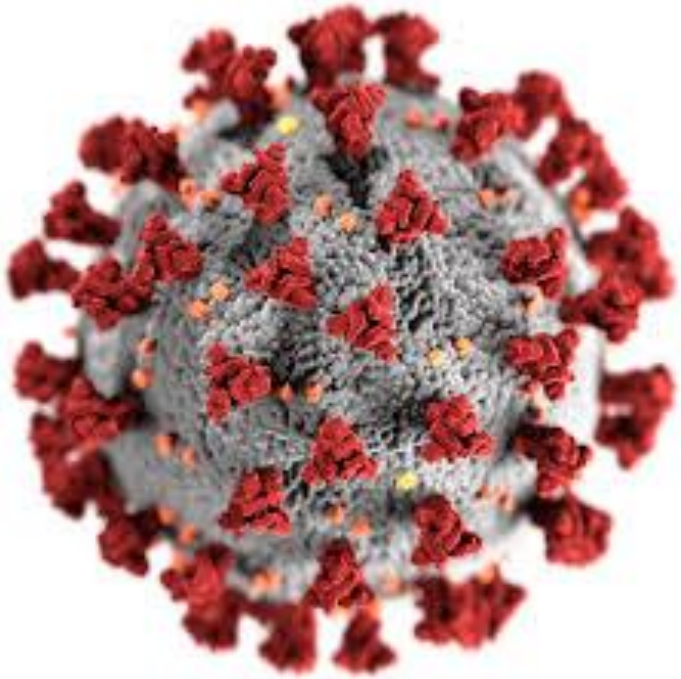
Open Access Full Text Article

ORIGINAL RESEARCH

# Incidence and costs of hip fractures vs strokes and acute myocardial infarction in Italy: comparative analysis based on national hospitalization records



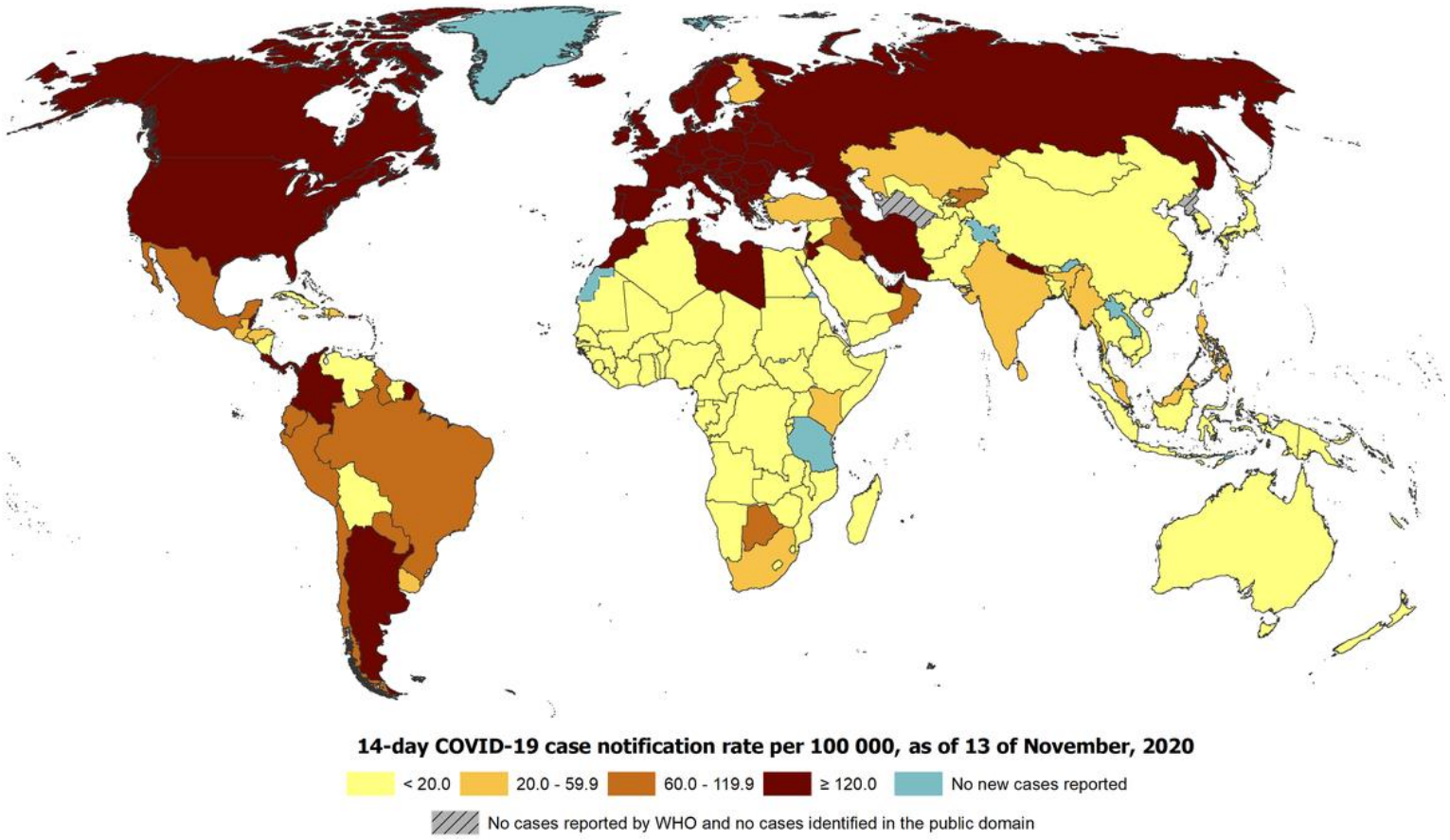

*Piscitelli P. et al. Clin Interv Aging. 2012.*

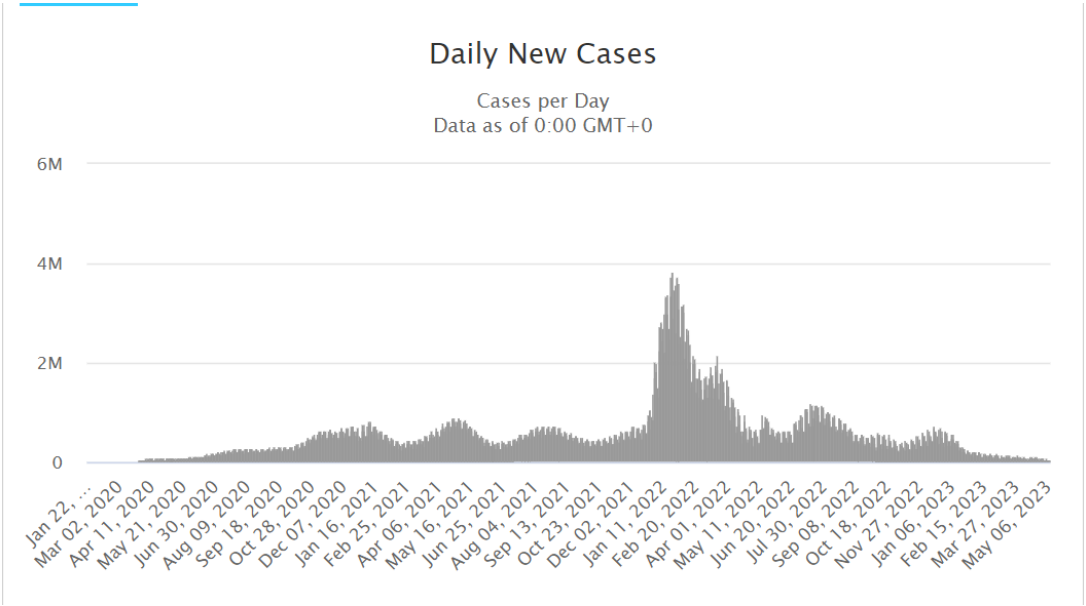


European Centre for Disease Prevention and Control
An agency of the European Union

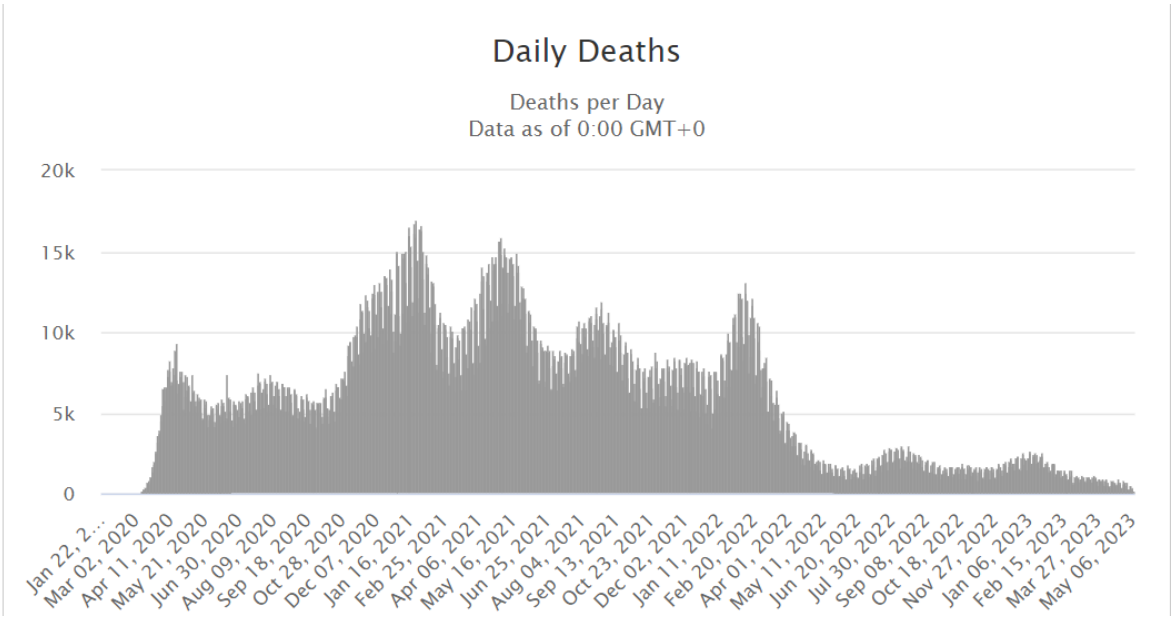
# COVID-19 situation update worldwide, as of 13 November 2020

Epidemiological update






worldometer




Accessed 2023

Il Fatto Quotidiano

## Coronavirus, auto e ambulanze in fila all'ospedale Cotugno di ...

“Attualmente ci sono 12 postazioni box nel triage e due terapie intensive nel Pronto soccorso proprio per cercare di alleviare la situazione.

6 giorni fa

La Repubblica

## Di Covid si muore nei pronto soccorso. Più ricoveri che ad aprile: è record

E mentre cercano, ci sono persone che muoiono negli ospedali aspettando un posto. Un uomo ricoverato nell'area “sospetti” del pronto soccorso ieri è stato ... soccorso, cioè mentre erano a bordo di tre ambulanze e un'auto e

1 giorno fa

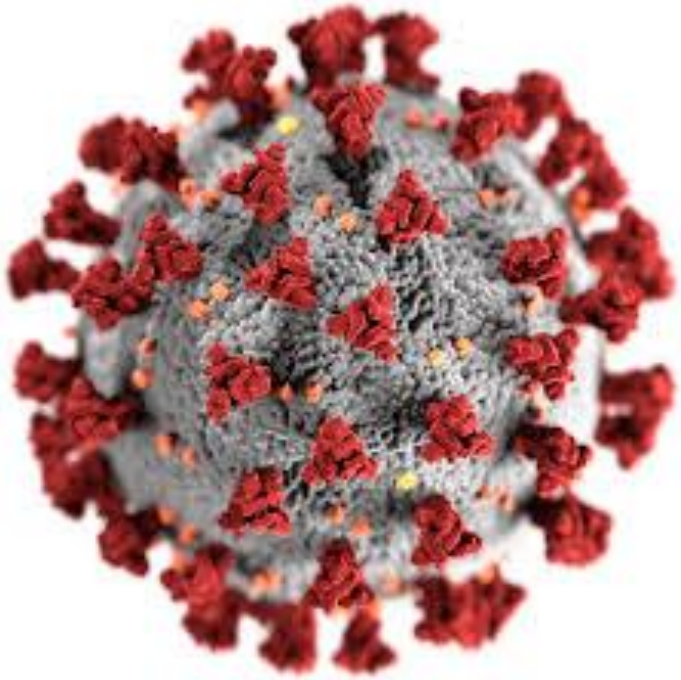

Cosenzachannel.it

## Il Comune ha allestito due tende davanti al Pronto Soccorso dell’Ospedale per accogliere i pazienti in attes…

... mattina davanti al Pronto soccorso dell'Ospedale dell'Annunziata ... disposizione auto in sicurezza e dispositivi di protezione individuale e ...

1 giorno fa

Tieniti aggiornato sui risultati relativi a: ***ospedali auto pronto***



**Come ha inciso?**

**Corresponding author mail-id:** leannedupley@doctors.org.uk

**Where did all the trauma go? A rapid review of the demands on orthopaedic services at a U.K. Major Trauma Centre during the COVID-19 pandemic.**

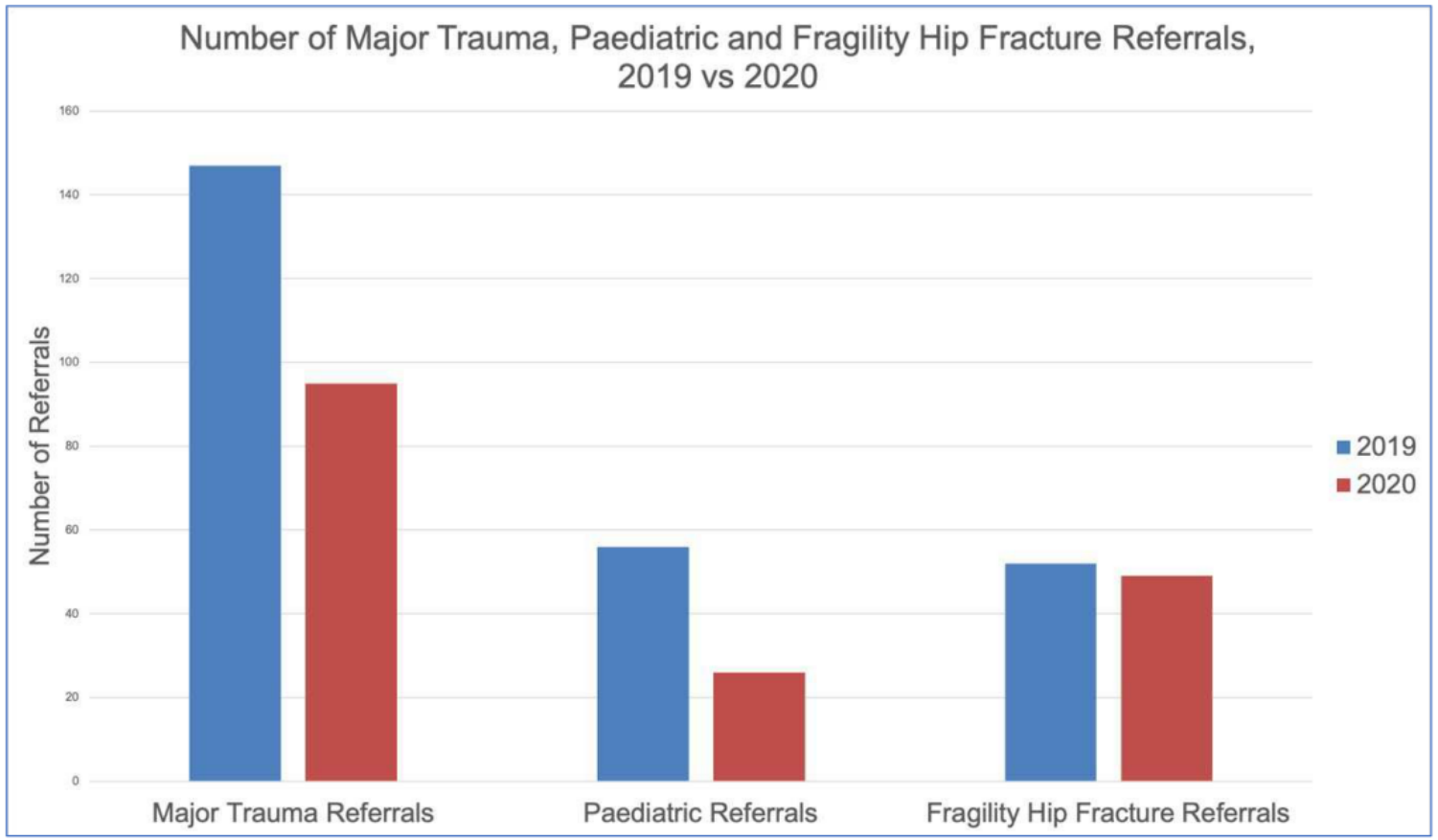



**Figure 3** - *Bar chart showing the number of major trauma, paediatric and fragility hip fracture referral from 16/03/2019 to 22/04/2019 in blue and 16/03/2020 to 22/04/2020 in red.*

# The impact of lockdown during the COVID-19 pandemic on osteoporotic fragility fractures: an observational study

Giulia Ogliari[1] · Eleanor Lunt[1] · Terence Ong[2] · Lindsey Marshall[3] · Opinder Sahota[1,4]

Received: 13 July 2020 / Accepted: 15 September 2020

12.6%). During lockdown, outpatients were younger compared with previous years ($p$ value 0.016, Table 2). The distribution of types of fractures during lockdown differed compared with previous years; in particular, the proportion of fractures of the ankle or foot during lockdown was lower compared with previous years ($p$ value 0.003, Table 2).

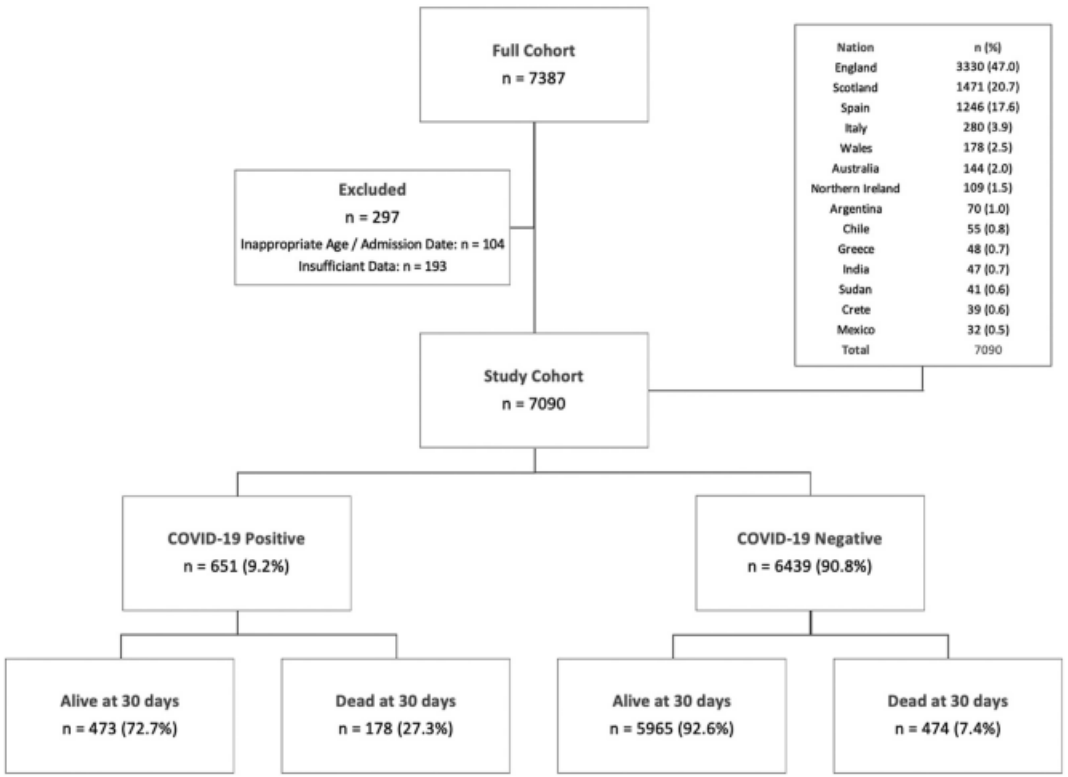
In contrast, the mean number of new inpatient admissions for acute hip fracture per week remained unchanged, during lockdown, in 2020, compared with corresponding periods, across the previous years (Supplemental Table 4). The clinical

THE SURGEON 20 (2022) E429–E446

# IMPACT-Global Hip Fracture Audit: Nosocomial infection, risk prediction and prognostication, minimum reporting standards and global collaborative audit

## Lessons from an international multicentre study of 7,090 patients conducted in 14 nations during the COVID-19 pandemic

*Andrew J. Hall* [a,b,c,i,*], *Nicholas D. Clement* [a,b,c], *IMPACT-Global Group* [1], *Cristina Ojeda-Thies* [e], *Alasdair MJ. MacLullich* [c,d], *Giuseppe Toro* [f], *Antony Johansen* [g], *Tim O. White* [a,b,h], *Andrew D. Duckworth* [a,b,h]




| Nation | n (%) |
|---|---|
| England | 3330 (47.0) |
| Scotland | 1471 (20.7) |
| Spain | 1246 (17.6) |
| Italy | 280 (3.9) |
| Wales | 178 (2.5) |
| Australia | 144 (2.0) |
| Northern Ireland | 109 (1.5) |
| Argentina | 70 (1.0) |
| Chile | 55 (0.8) |
| Greece | 48 (0.7) |
| India | 47 (0.7) |
| Sudan | 41 (0.6) |
| Crete | 39 (0.6) |
| Mexico | 32 (0.5) |
| Total | 7090 |

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**Table 3 – Patient demographics, Nottingham hip fracture score, admission blood results, residence, place of injury, comorbidity, time to surgery, ASA grade, management, admission blood tests, length of stay, and mortality according to COVID status.**

| Demographic | Descriptive | COVID-19 Status | | Difference/Odds Ratio (95% CI) | p-value[a] |
|---|---|---|---|---|---|
| | | Negative (n = 6439) | Positive (n = 651) | | |
| **Age** (years: mean, SD) | | 82.0 (10.7) | 84.3 (9.0) | 2.3 (1.5–3.2) | <0.001 |
| **Sex** (n, % of group) | Female | 4550 (70.66) | 409 (0.15) | Reference | |
| | Male | 1888 (29.32) | 242 (37.17) | 1.43 (1.21–1.69) | <0.001 |
| | Missing | 1 (0.01) | 0 (0.00) | N/A | |
| **Nottingham Hip Fracture Score** (mean, SD) | | 4.8 (2.4) | 5.6 (4.0) | 0.8 (0.6–1.0) | <0.001 |
| **Residence** (n, % of group) | Home/Sheltered | 5004 (77.71) | 361 (55.45) | Reference | |
| | Care/Nursing home | 1160 (18.01) | 227 (34.87) | 2.71 (2.27–3.24) | <0.001 |
| | Hospital | 83 (1.29) | 20 (3.07) | 3.34 (2.03–5.51) | <0.001 |
| | Missing | 192 (2.98) | 43 (6.60) | 3.10 (2.19–4.39) | <0.001 |
| **Place of injury** (n, % of group) | Home/Indoor | 5090 (79.05) | 544 (83.56) | Reference | |
| | Outdoor | 916 (14.22) | 43 (6.60) | 0.44 (0.32–0.60) | <0.001 |
| | Hospital | 152 (2.36) | 39 (5.99) | 2.40 (1.67–3.45) | <0.001 |
| | Missing | 281 (4.36) | 25 3.84) | 0.83 (0.55–1.27) | 0.390 |
| **Comorbidity**[a] (n, % of group) | Not present | | | | |
| | CVD | 4130 (64.14) | 471 (72.35) | 1.47 (1.23–1.76) | <0.001 |
| | Renal Disease | 1333 (20.70) | 157 (24.12) | 1.22 (1.01–1.48) | 0.039 |
| | Pulmonary Disease | 1408 (21.87) | 170 (26.11) | 1.26 (1.05–1.52) | 0.013 |
| | Dementia | 1865 (28.96) | 287 (44.09) | 1.94 (1.64–2.28) | <0.001 |
| | Cancer | 686 (10.65) | 53 (8.14) | 0.74 (0.56–1.0) | 0.046 |
| | Diabetes Mellitus | 1277 (19.83) | 138 (21.20) | 1.09 (0.89–1.33) | 0.398 |
| **Surgery <36 h** (n, % of group) | Yes | 3991 (61.98) | 390 (59.91) | Reference | |
| | No | 2246 (34.88) | 221 (33.95) | 1.01 (0.85–1.20) | 0.920 |
| | N/A | 167 (2.59) | 37 (5.68) | 2.27 (1.56–3.29) | <0.001 |
| | Missing | 35 (0.54) | 3 (0.46) | 0.88 (0.27–2.87) | |
| **ASA grade** (n, % of group) | 1 | 119 (1.85) | 3 (0.46) | 0.50 (0.15–1.61) | 0.233 |
| | 2 | 1363 (21.17) | 69 (10.60) | Reference | |
| | 3 | 3705 (57.55) | 369 (56.68) | 1.97 (1.51–2.56) | <0.001 |
| | 4 | 983 (15.27) | 181 (27.80) | 3.64 (2.72–4.85) | <0.001 |
| | 5 | 12 (0.19) | 9 (1.38) | 14.82 (6.04–36.35) | <0.001 |
| | Missing or N/A | 257 (3.99) | 20 (3.07) | 1.54 (0.92–2.57) | 0.100 |

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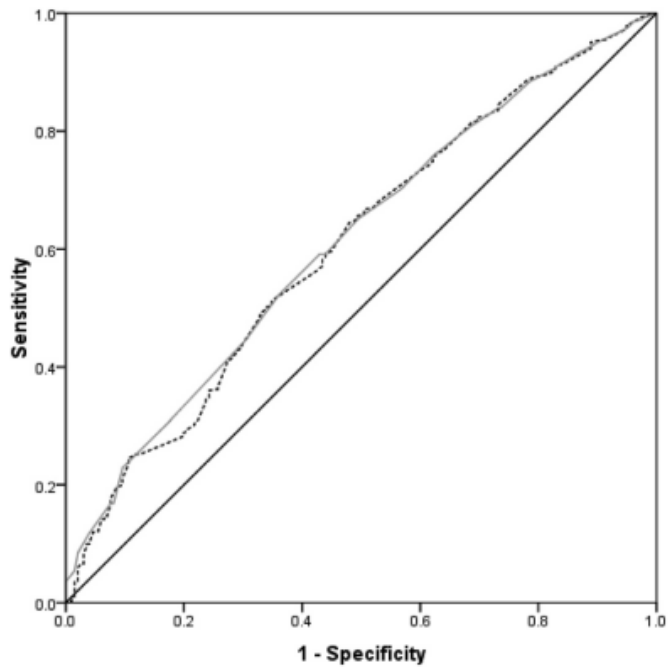


**Fig. 4 – ROC curve for lymphocyte count (grey) and albumin (black dashed) as a predictor of COVID-19 on admission. Lymphocyte: Area under the curve 60.7% (95% CI 56.7%–64.6%, p < 0.001). Threshold of 0.93 or less has 58.2% specificity and 56.6% sensitivity. Albumin: Area under the curve 61.3% (95% CI 57.5%–65.2%, p < 0.001). Threshold of 36 g/dL or less has 59.1% specificity and 57.1%sensitivity.**

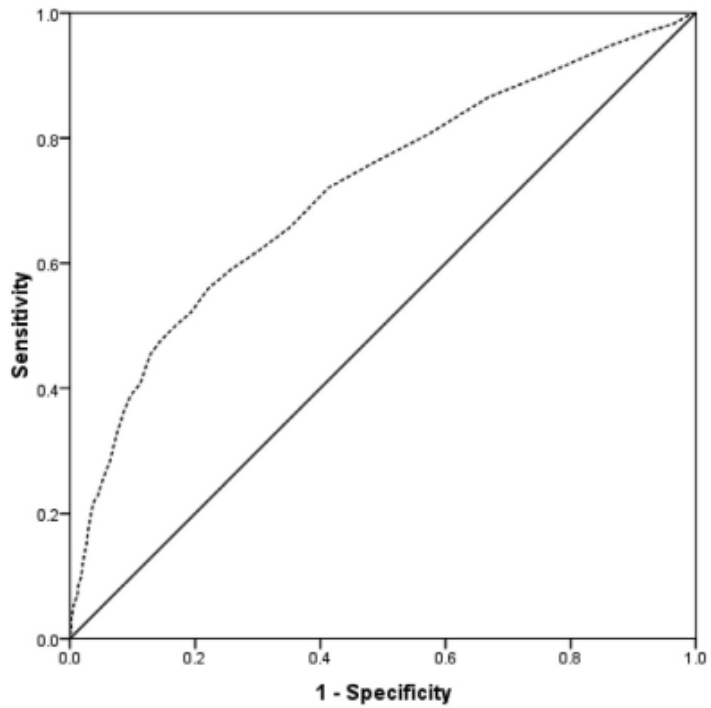


**Fig. 5 – ROC curve for length of hospital stay (dashed line) as a predictor of developing COVID-19 following admission. Area under the curve 71.6% (95% CI 68.8%–74.4%, p < 0.001). Threshold of 10 days or more has 65% specificity and sensitivity.**

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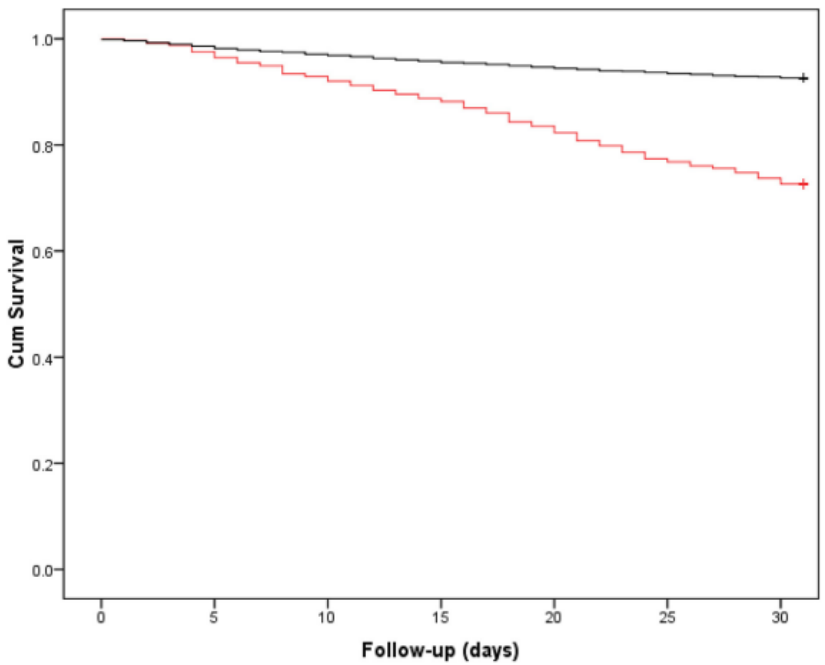


**Fig. 2 – Kaplan Meier curve for 30-day survival according to whether a patient was COVID negative (black) or COVID positive (red) within 30-days of admission. Log rank p < 0.001, 92.6% (95% CI 92.4 to 92.8) versus 72.7% (95% CI 69.4 to 76.0) at 30-days.**

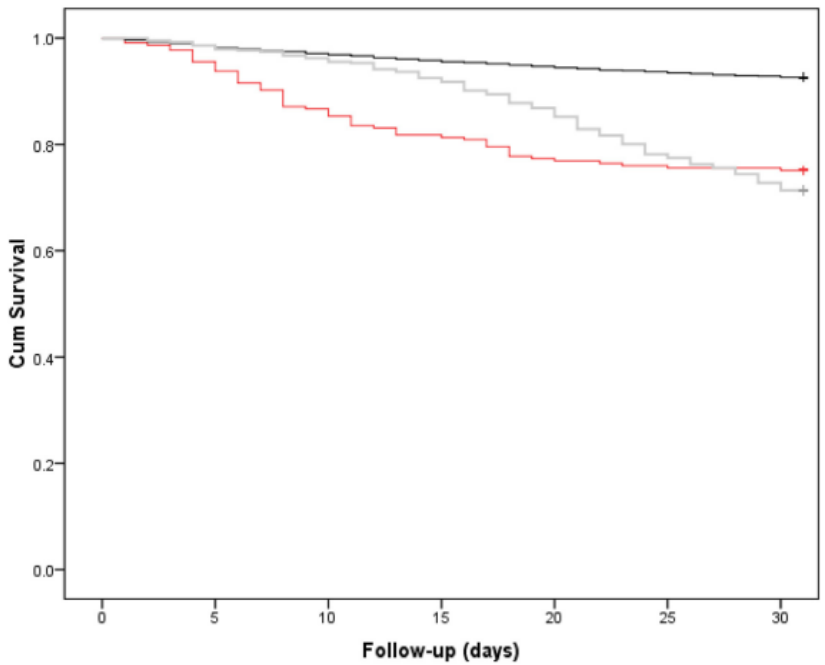


**Fig. 3 – Kaplan Meier curve for 30-day survival according to whether a patient was COVID negative (black), COVID positive at admission (red) or COVID positive after admission (grey). Log rank p = 0.661, between COVID positive patients preoperatively (75.1%, 95% CI 69.4 to 80.8) versus postoperatively (71.4%, 95% CI 67.1 to 75.7) at 30-days.**

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**Table 8 – Cox regression model identifying patient related factors associated with 30-day mortality following a hip fracture in patients for patients with COVID-19.**

| Demographic | Descriptive | Hazard Ratio (95% CI) | p-value* |
|---|---|---|---|
| **Age** (for each increasing year) | | 1.03 (1.01–1.05) | **0.028** |
| **Sex** | Female | Reference | |
| | Male | 2.35 (1.66–3.34) | **<0.001** |
| | | 1.00 (0.97–1.03 | 0.825 |
| | | Reference | |
| | | 1.32 (0.90–1.95) | 0.155 |
| | | 1.17 (0.30–4.45) | 0.823 |
| | | 0.98 (0.46–2.12) | 0.982 |
| | | Reference | |
| | | 0.35 (0.11–1.14) | 0.081 |
| | | 0.64 (0.24–1.72) | 0.374 |
| | | 0.32 (0.06–1.56) | 0.158 |
| | | Reference | |
| | | 1.53 (1.08–2.18) | **0.017** |
| | | 1.45 (1.02–2.06) | **0.039** |
| | | 1.24 (0.85–1.83) | 0.266 |
| | | 8.69 (0.96–78.75) | 0.055 |
| | | Reference | |
| | | 2.36 (0.94–5.88) | 0.066 |
| | | 2.41 (0.94–6.14) | 0.066 |
| | | 2.66 (0.78–9.02) | 0.117 |
| | | 1.97 (0.46–8.44) | 0.358 |
| | | Reference | |
| | | 0.75 (0.53–1.06) | 0.103 |
| | | 2.59 (1.52–4.43) | <0.001 |
| | | – | |
| | | 1.29 (0.13–12.38) | 0.824 |
| **Blood tests** (for each increasing unit) | Lymphocyte | 0.83 (0.62–1.12) | 0.233 |
| | Platelet | 1.00 (1.00–1.00) | 0.085 |
| | Albumin | 0.98 (0.95–1.01) | 0.132 |

## Conclusion

The prevalence of COVID-19 in the hip fracture population was at least ten times higher than the background prevalence and was independently associated with a three-fold increase in 30-day mortality. Thus, hip fracture patients may be the cohort of hospital admissions that account for the largest number of COVID-19-related deaths. It is likely that nosocomial transmission of this disease was responsible for a significant proportion of infections, and the development of robust infection prevention and control strategies are likely to improve the management of future outbreaks. The IMPACT collaborative has demonstrated important lessons in the conduct of rapid clinical audit in order to guide the evidence-based response to emerging diseases, and a number of strategies are suggested that can be applied prospectively to ensure better preparedness for future health crises.

THERAPEUTIC ADVANCES in
*Musculoskeletal Disease*

# Bone fragility during the COVID-19 pandemic: the role of macro- and micronutrients

Antimo Moretti, Sara Liguori, Marco Paoletta, Silvia Migliaccio, Giuseppe Toro, Francesca Gimigliano and Giovanni Iolascon

2023

long-term care (i.e. long COVID).[172–174] Long-COVID-19 is 'the persistence of signs and symptoms that develop following an infection consistent with COVID-19 which continue for more than 12 weeks and are not explained by an alternative diagnosis'.[175] In this syndrome, malnutrition, dysphagia, appetite loss, taste/smell alterations, gut microbiota changes, and sarcopenia have been reported, requiring an adequate nutritional approach.[176–178] On the other side, inadequate nutrition might be associated with long-COVID-19.[179]

ery.[187,188] A recent study characterized the effects of SARS-CoV-2 infection on bone metabolism in the acute and post-recovery periods in an animal model.[182] The microcomputerized tomography (μCT) and histological analysis of golden Syrian hamsters showed an early and progressive bone loss particularly in the trabecular component in terms of bone volume (–50% than noninfected hamsters), density and trabecular thickness, and number at the distal femur and proximal tibia from 4 days after infection to post-acute (1 month), and the recovery phase (2 months), while cortical component was poorly affected.

During the pandemic, a change in lifestyle has been observed, even in nutritional habits. During self-isolation at home, people of low- and middle-income countries (LMICs) had a limited food intake, whereas people in developed countries increased their caloric intake,[192] particularly in terms of processed and cheaper food with a low nutritional value[193] Moreover, an increased risk of malnutrition was reported in hospitalized COVID 19 patients, regardless of country.[194]

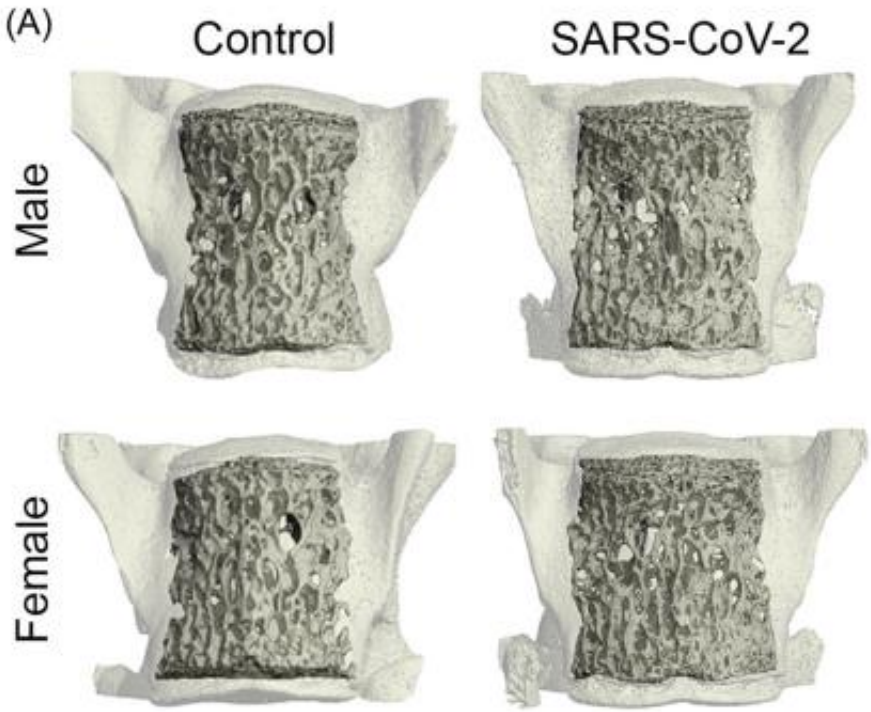
RESEARCH ARTICLE

Journal of Orthopaedic Research®

# Acute bone loss following SARS-CoV-2 infection in mice

Anne K. Haudenschild[1] | Blaine A. Christiansen[1] | Sophie Orr[1] | Erin E. Ball[2] | Christopher M. Weiss[3] | Hongwei Liu[3] | David P. Fyhrie[1] | Jasper H. N. Yik[1] | Lark L. Coffey[2] | Dominik R. Haudenschild[1]

2022




microstructure, suggesting that decreased bone mass, increased fracture risk, and other musculoskeletal complications could potentially be long-term comorbidities for people with COVID-19.

THERAPEUTIC ADVANCES in
*Musculoskeletal Disease*

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Antimo Moretti, Sara Liguori, Marco Paoletta, Silvia Migliaccio, Giuseppe Toro, Francesca Gimigliano and Giovanni Iolascon

2023

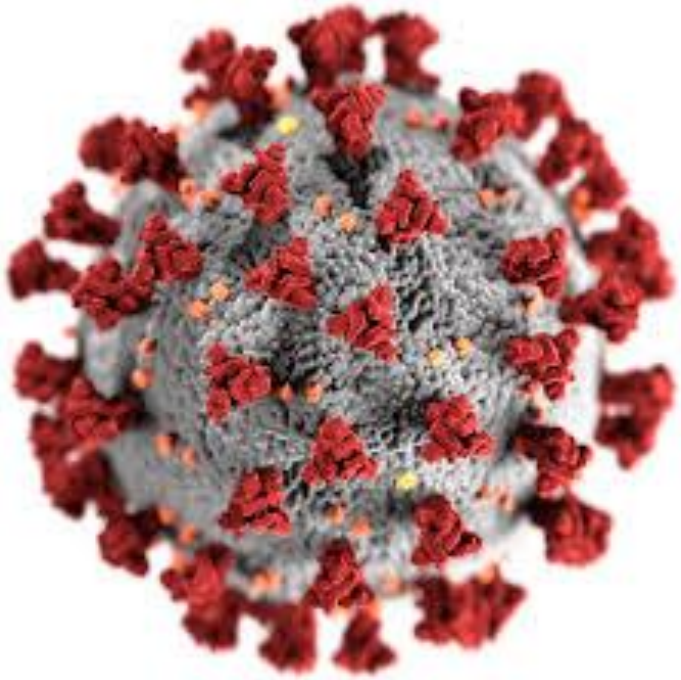
- Water accounts for up to 20% of bone volume as both essential nutrient for mechanical behaviour of bone tissue (i.e., ductility) and carrier for other key nutrients (e.g., calcium).
- Proteins account for about 50% of bone volume and increase type I collagen synthesis (i.e., lysine and arginine), periosteal circumference, cortical area, bone mineral content, and strength-strain index (i.e., animal proteins).
- High-fat diet reduces trabecular bone volume, trabecular number, and bone mineral content.
- The adequate assessment of food intake rather than single nutrients might be cost-effective for the management of bone fragility.
- The consumption of fermented dairy products, such as yogurt and cheese, improves bone health.
- Long-COVID patients might be affected by taste/smell alterations, appetite loss, dysphagia, malnutrition and gut microbiota changes.
- SARS-CoV2 causes early and progressive loss of trabecular bone volume, trabecular density and thickness, and trabecular number.
- Post-COVID-19 patients did not consume the recommended daily protein intake for bone health.
- 400–1000 IU daily of vitamin D are recommended for bone health during the COVID-19 pandemic.

# Anti-osteoporosis medication dispensing by clinical commissioning groups in England – an ecological study of variability in practice and of the effect of the Covid-19 pandemic

Sobia S. Janjua[1] | Helen F. Boardman[1] | Arvind Sami[2] | Antony Johansen[3,4] | Li Shean Toh[1] | Kassim M. Javaid[2,4]

Pharmacoepidemiol Drug Saf. 2023

start of the pandemic (April to June 2020), rates dispensed of Alendronate per 1000 people aged over 65 years decreased across 89.6% ($n = 95$) of CCGs, when compared to the same quarter in 2019 ($p \leq 0.001$). Rates of Denosumab also decreased across 39.6% ($n = 42$) of CCGs but were the same for 9.4% ($n = 10$) of CCGs with no overall significant change ($p = 0.12$). In contrast, all



# Cosa fare?

Review Article

# Challenges and strategies in management of osteoporosis and fragility fracture care during COVID-19 pandemic

Gaurav K. Upadhyaya[a], Karthikeyan Iyengar[b], Vijay K. Jain[c,*], Raju Vaishya[d]

### *7.1. Obligatory fractures*

### *7.2. Non obligatory fractures*

Prioritizing surgical treatment of obligatory fractures in patient care and conservative management of non-obligatory fractures will need

# Differenziare i pazienti!

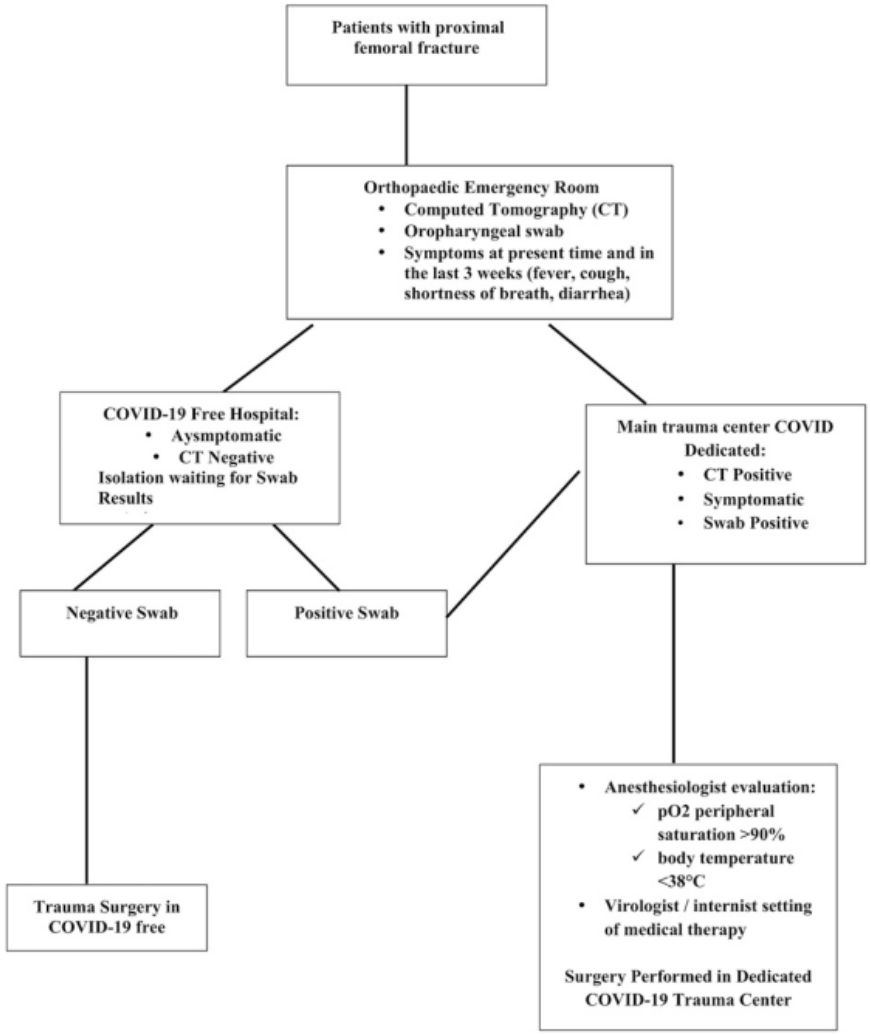



Fig. 3
Algorithm for the treatment of COVID-19-positive patients with a lateral femoral neck fracture.

Catellani et al.,JBJS 2020

# Treatment of Proximal Femoral Fragility Fractures in Patients with COVID-19 During the SARS-CoV-2 Outbreak in Northern Italy

Francesco Catellani, MD, Andrea Coscione, MD, Riccardo D'Ambrosi, MD, Luca Usai, MD, Claudio Roscitano, MD, and Gennaro Fiorentino, MD

*Investigation performed at Humanitas Gavazzeni, Bergamo, Italy*

Jbjs 2020

**TABLE II $O_2$ Saturation and Assisted Respiratory Support Before Surgery and on First, Third, and Seventh Days After Surgery**

| Patient | Type of Surgery | $pO_2$ Saturation, Ventilation | | |
|---|---|---|---|---|
| | | 1st Postop. Day | 3rd Postop. Day | 7th Postop. Day |
| 1 | Intramedullary nail | 93%, 2 L/min Venturi mask | 98%, 2 L/min Venturi mask | 98%, ambient air |
| 2 | Partial hip replacement | 96%, 8 L/min Venturi mask | 97%, 6 L/min Venturi mask | 96%, 2 L/min Venturi mask |
| 3 | Partial hip replacement | 88%, 15 L/min reservoir | 92%, 5L Venturi mask | 92%, 5 L/min Venturi mask |
| 4 | Intramedullary nail | 92%, 12 L/min Venturi mask | 92%, 12 L/min Venturi mask | 90%, 12 L/min Venturi mask |
| 5 | Intramedullary nail | 90%, 4 L/min Venturi mask | 96%, 4 L/min Venturi mask | 96%, 4 L/min Venturi mask |
| 6 | Intramedullary nail | 96%, 4 L/min Venturi mask | 96%, 4 L/min Venturi mask | 96%, 4 L/min Venturi mask |
| 7 | Intramedullary nail | 96%, 10 L/min Venturi mask | 96%, 10 L/min Venturi mask | 96%, 8 L/min Venturi mask |
| 8 | Intramedullary nail | 90%, 15 L/min Venturi mask | Deceased | — |
| 9 | Partial hip replacement | Deceased | — | — |
| 10 | Partial hip replacement | 90%, 15 L/min Venturi mask | 88%, 15 L/min reservoir | Deceased |
| 11 | Partial hip replacement | 94%, 6 L/min Venturi mask | 94%, 2 L/min Venturi mask | 94%, 2 L/min Venturi mask |
| 12 | Intramedullary nail | 96%, 10 L/min Venturi mask | 96%, 10 L/min Venturi mask | 94%, 6 L/min Venturi mask |
| 13 | Intramedullary nail | 88%, 15 L/min reservoir | Deceased | — |

Review Article

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*7.1. Obligatory fractures*

*7.2. Non obligatory fractures*

Prioritizing surgical treatment of obligatory fractures in patient care and conservative management of non-obligatory fractures will need

# Managing fragility fractures during the COVID-19 pandemic

*Nicola Napoli*[1,2]✉, *Ann L. Elderkin*[3], *Douglas P. Kiel*[4,5] *and Sundeep Khosla*[6]

The COVID-19 pandemic has broad implications for the care of patients with bone fragility. A dramatic surge in fractures and related mortality is expected in the next few months. We pledge to intensify the current efforts to improve the management of bone health, and to prioritize fragility fracture care and prevention.

thereafter, in many countries, osteoporosis outpatient clinics were either closed or were seeing very few, urgent patients; in addition, many hospitals reduced orthopaedic services to make space for patients with COVID-19 (REF.[2]).

International Journal of
*Environmental Research and Public Health*

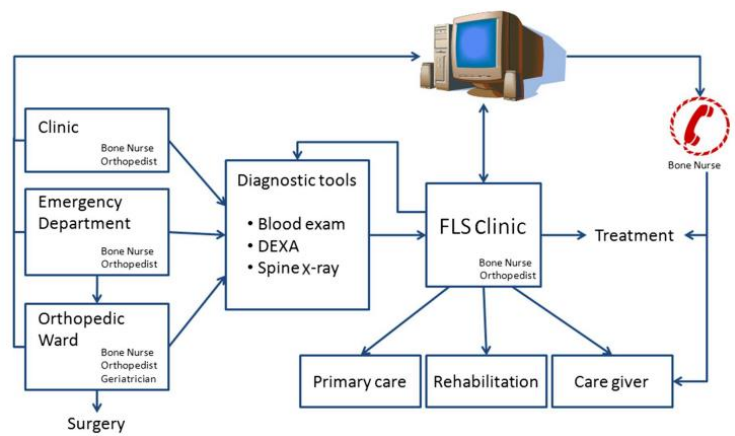
MDPI

*Review*

# State of Fragility Fractures Management during the COVID-19 Pandemic

**Umberto Tarantino [1,2], Ida Cariati [1,3,*], Virginia Tancredi [4,5], Donato Casamassima [2], Eleonora Piccirilli [2], Riccardo Iundusi [2] and Elena Gasbarra [2]**

fractures. Therefore, in this pandemic emergency scenario, it would be important to implement FLS, since they have demonstrated their potential clinical and economic efficacy and have been recommended worldwide to reduce the risk of fractures after a first fracture.



# Telemedicine in orthopaedics and its potential applications during COVID-19 and beyond: A systematic review

Zakir Haider[1], Bashaar Aweid[2], Padmanabhan Subramanian[1] and Farhad Iranpour[1]

or PROMs using telemedicine. However, in a study which concluded telemedicine has good accuracy of examination, three injuries were found to be under-treated including a base of fifth metatarsal fracture and mallet injury, both of which have high a propensity of non-union.[31] No authors reported significant differences in adverse events or reduced outcomes in patients using telemedicine vs. F2F consultations, although

Patients revealed particularly high satisfaction with telemedicine for reasons of convenience, reduced appointment delays, travelling times, travel costs and time off work, findings which support existing literature on high patient satisfaction with telemedicine.[36]

There is variable evidence to suggest that telemedicine within orthopaedic consultations can be safe, cost effective, valid in clinical assessment, and with high patient and clinician satisfaction. However, more

International Journal of
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# State of Fragility Fractures Management during the COVID-19 Pandemic

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For patients suffering from fragility fractures, pharmacological treatment must be started immediately after the fracture, and multidisciplinary care (orthopaedic surgeon, physiatrist, geriatrician, nurse) is essential. However, considering the current barriers and the ban on going to hospitals and

the absence of diagnosis, were extremely penalized in terms of organizing treatment. In the presence of diagnosis, the formulation of the therapy did not always coincide with the patient's adherence for several reasons, primarily logistical, and this certainly represented a problem, since inadequate adherence to therapy is associated with an increased risk of fractures [22,23].

or temporary transition to other drug therapies have been provided. However, it should be noted that, during the COVID-19 pandemic, patients already being treated with osteoporosis drugs should continue to receive ongoing therapies, as there is currently no evidence that osteoporosis therapy increases the risk or severity of infection or alters the course of the disease. Furthermore, there is no

balanced and varied to ensure an adequate supply of valuable bone nutrients, particularly calcium and vitamin D. Vitamin D is known to be a fundamental hormone in calcium homeostasis and bone

THERAPEUTIC ADVANCES in
*Musculoskeletal Disease*

# Bone fragility during the COVID-19 pandemic: the role of macro- and micronutrients

Antimo Moretti, Sara Liguori, Marco Paoletta, Silvia Migliaccio, Giuseppe Toro, Francesca Gimigliano and Giovanni Iolascon

2023

skeletal fragility. In this context, the comprehensive management of COVID-19-related complications, including bone fragility, should provide an adequate intake of nutrients, starting from waters rich in calcium and bicarbonate to macronutrients, such as proteins rich in lysine and arginine, monounsaturated fatty acids (MUFAs), and water-soluble fibers containing inulin, and micronutrients, such as calcium, magnesium, vitamin C, vitamin D, vitamin K, copper, Si, and strontium, although, for some of these nutrients, no evidence is available so far.

PERSPECTIVE

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# Osteoporosis Management in the Era of COVID-19

Elaine W Yu,[1] Elena Tsourdi,[2,3] Bart L Clarke,[4] Douglas C Bauer,[5,6] and Matthew T Drake[4,7]

Alternative methods of delivering parenteral osteoporosis treatments

- Off-site clinics: The administration of treatments at locations geographically isolated from COVID-19 "hot spots" should be considered whenever possible. However, it should be recognized that this may disadvantage socioeconomically challenged communities if public transportation options are not available.
- Home delivery and administration: This is an option if available but may be logistically difficult to arrange due to reliance on home-visiting medical staff. Self-injection of denosumab (and/or romosozumab) has been proposed and is reportedly available in some locales. However, there are important medico-legal issues to consider surrounding the proper product handling and administration, including the small risk of drug-related hypersensitivity reactions that could occur in the absence of a medical provider, although steps to mitigate such potential risks may be in place in some communities.
- Drive-through administration of denosumab and/or romosozumab: This may also be logistically difficult to arrange. Further, it is recommended that patients be monitored by a medical provider for 15 minutes after injection in the unlikely event of a hypersensitivity reaction.

# Conclusioni

- Fragilità in Covid priorità per l'ortopedico

- Infezione aumenta mortalità!
  - Fratture maggiori da trattare chirurgicamente il prima possibile
  - Aumentare il ricorso alla terapia conservativa per quelle minori
  - Differenziare i percorsi!

- Implementazione di FLS (telemedicina?!) e percorsi di terapia domiciliare

- Malnutrizione


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